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Comparison of side effects and marital satisfaction between the women taking Cyclofem and Depo Medroxyprogesteron contraceptive ampoules

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Abstract

Introduction: None of the contraceptive methods is fault-free and all come with some complications. In this study we investigated the comparison of complications and marital satisfaction between the women taking Cyclofem contraceptive ampoule and DMPA.

Material and Methods: This study was performed on 300 married women use cyclofem and Depo Medroxyprogesterone for family planning. 150 people in each group. Data collection tools included two types of questionnaires; one for studying the complications and the other for examining the marital satisfaction(Enrich Couple Questionnaire).

Result: Increased days of menstrual bleeding in Depo Medroxy consumers were more than those of Cyclofem consumers, and there is a significant difference (P=0.004). Furthermore, both groups are similar in terms of weight changes, mood disorders, libido changes and all other complications and there was no significant difference. Cyclofem ampoule has been used 62% for one year, Depo Medroxy ampoule has been used 60% for one year. Continuation rate of using Depo Medroxyprogesterone was more than Cyclofem. (P=0.02) There was no significant relationship between marital satisfaction and age, education, number of children and job. Average marital satisfaction in women using Depo Medroxyprogesterone contraceptive method was 116.79+/- 8.62 that was significantly higher than the average marital satisfaction in women using Cyclofem contraceptive method as 114.53+/- 7.16 (P = 0.01).

Conclusion: based on the results achieved in the present and similar studies, the complications occurred by Cyclofem and Depo Medroxyprogesterone ampoules are similar and they have no significant difference; and these complications are not fatal and irreversible.

Key word: side effects, family planning, cyclofem, Depomedroxy.

Introduction

Although in recent years, world population[1] as well as Iran's population growth has been declined[2,3] there is still a need for family planning to reduce poverty and to enjoy more health for mother and her child as well as for better training.[4] On the other hand, recent reports indicate that the rate of unwanted pregnancies[5] and induced abortion is high in our country.[6,7] Based on the past studies, one-third of pregnancies in large cities (Tehran) are unwanted which cause to increase the rate of illegal abortions and thus the maternal health would be endangered.[7] There are a variety of contraceptive methods including hormonal ones such as Cyclofem and Depo Medroxyprogesterone. In its report in 2000 prepared based on the researches conducted in relation to reproductive issues, World Health Organization (WHO) wrote that though DMPA ampoules are highly effective on contraceptives, the rate of discontinuation is still remarkable due to side effects. For this reason, researchers are seeking a better alternative to this ampoule.[8] Considerable efforts have been made to reduce hormonal compounds

doses in order to minimize the complications risk. Such efforts made for reducing hormonal content were based on "low as much as possible and high as much as necessary[9]. Injection hormonal method as one of the contraception methods with high efficacy is assumed suitable because it is easy to use and has no interference with sexual intercourse.[10] Cyclofem ampoule is a very effective method of contraception with 1-month intervals; it contains 25 mg of Medroxyprogsterone Acetate and 5 mg of Estradiol Cypionate. DMPA is also an effective hormone for contraception; it is injected intramuscular once every 12 weeks.[11] None of the contraceptive methods is fault-free and all come with some complications. Below items could be mentioned for complications of hormonal methods: menstrual disorders, amenorrhea, irregular uterine bleeding, weight gain, headache, decreased libido, nervousness, fatigue, mood changes, etc.[12,13,14,15] The studies have shown that such complications are occurred with different rates in different communities.[15,16,17] Thus, the complaints of side effects occurrence for the clients could be reduced by careful consideration of side effects, and their satisfaction would be promoted. Consumers of such hormonal methods face physical, psychological and mental disorders due to unwanted complications, which sometimes affect marital satisfaction; marital satisfaction is a condition in which married couples are happy and satisfied with each other.[18] Many variables are effective on how couples communicate with each other during their common life including income, employment, children, illness and sexual satisfaction.[19] Changes in physical and psychological status of these individuals may lead to unfavorable reactions and behaviors by avoiding their housekeeping obligations as well as routine duties and functions. Although marital satisfaction and factors affecting it has been focus of attention by Iranian researchers, there are no studies on this particular issue on these people. Therefore, considering the shortages and the importance of this topic, the researchers decided to study the comparison of complications and marital satisfaction between the women taking Cyclofem contraceptive ampoule and DMPA.

Materials and Methods

This study is comparative and was conducted by cluster sampling. Population under study was women using contraceptive methods of Cyclofem and DMPA provided from health centers in Babol, Iran.15 health centers allocated among 42 urban and rural Health center with cluster samleing. Duration of sampling was 6 month. Precondition for entering the study was at least two 3-month periods; i.e. 6-month use of Depo Medroxyprogesterone ampoule and at least 3 one-month periods; i.e. 3 months use of Cyclofem ampoule due to adjustment of side effects of the hormonal methods after first few months of use. Furthermore, the samples should not use any other hormonal method while using this method.the women should have at least 1 child,do not have any illness that interfered with complication. Do not have any psycho logic disorder and no death of close relative. With use of pilot study Sample size was determined as 150 people in each group.

Data collection tools included two types of questionnaires; one for studying the complications and the other for examining the marital satisfaction. Questionnaires related to complications were prepared considering the previous studies and the existing scientific resources and for validity 10 expert persons and gynecologist review the questions that consist in two parts: (1) profile consisting of 6 demographic questions involve: age, occupation, education, number of children, method of contraception,duration of consumption of the method and (2) a part related to the complications of ampoules including 15 questions about Menstrual disorder, Mood disorder, weight, Locure, Libido, Hirsotism, Vomating, Headache, Breast sensitivity, backache, early exhaustion.Hair shedding, foot muscle contraction, Abdominal bloat, Face ruch, Vertigo, Decrease power.

Definition of variable

Menstrual disorder was: **Amenorrhea**: stop menstruation during consumption.

Decreasing days of bleeding: Reduce the days of bleeding lower than 3 days or lower than use previous method,

Increase days of bleeding: Increase days of bleeding more than 7 days or more than use previous method,

Increase volume of bleeding:Use 6 or more than 6 pads at 3 first days.

Regular menstruation: menstruation occurs in ordinary duration between 28-30 days.

Irregular menstruation: menstruation occur in untidy duration

Change libido: Decrease or Increase sexual tendency in comparison previous method.

Change weight: Decrease or Increase in weight in comparison previous method.

The other variables defined as: The change in comparison past.

We use of binary questions and nominal variable for all complication variable.

Enrich Couple Questionnaire (Fowers & Olson, 1989) with 92% validity that consisting of 35 questions) translated by Asoodeh M, et al (1389) including 4 subscales and 35 questions about satisfaction, communication and conflict resolution was used to examine the marital satisfaction. This questionnaire as a valid research instrument has been used in many researches and clinical works. And likert scale use for Evaluation. The score lower than 30 presented intensive dissatisfaction. Score between 30-40 presented dissatisfaction. Score between 60-70 presented very satisfaction. Score more than 70 presented intensive marital satisfaction between couple. Data so collected were analyzed by statistical software SPSS/v19 applying descriptive statistics, chi-square test, t-test and Pearson Correlation.

Results

All respondents have been in age range of 17-50 years old. Average total age of the respondents was 31.57± 8.03 and there was no significant difference between two groups using Cyclofem and Depo Medroxyprogesterone in respect of age, number of children, occupation and education.

According to Table, two groups using Depo Medroxyprogesterone and Cyclofem contraceptive methods were similar for menstrual disorders including amenore, decreasing days of bleeding, breakthrough bleeding, increased bleeding, more regular menstrual cycles and irregular menstrual cycles, and they have no significant statistical differences. But increased days of menstrual bleeding in Depo Medroxy consumers were more than those of Cyclofem consumers, and there is a significant difference (P=0.004). Furthermore, both groups are similar in terms of weight changes, mood disorders, libido changes and all other complications and there was no significant difference. Cyclofem ampoule has been used 62% for one year, 22.7% for two years and 15.3% for three years and more. Depo Medroxy ampoule has been used 60% for one year, 16.7% for two years and 23.3% for three years and more. A comparison between the consumption periods of two Depo Medroxyprogesterone and Cyclofem ampoules showed that there is a significant difference between consumption period and type of contraceptive method (P=0.02); it means that continuation rate of using Depo Medroxyprogesterone ampoule for consumers was more than Cyclofem ampoule. Relationship between the continuation in the use of the related method and the age of the consumers in two groups of women using Cyclofem injection and Depo Medroxyprogesteron ampoule showed that no significant relationship was observed between continuous use of contraceptive method in women who have used Cyclofem ampoule and their age. (P=0.07, Rho=0.14). However, a significant relationship has been observed between continuous use of contraceptive method in women who have used Depo Medroxyprogesterone ampoule and their age. (P=0.01, Rho=0.20). Pearson Correlation test showed that there was no significant relationship between marital satisfaction and age, education, number of children and job. Score of marital satisfaction in women using Cyclofem ampoule was minimum 100 and maximum 136. Score of marital satisfaction in women using Depo Medroxyprogesterone ampoule was minimum 102 and maximum 142. Average marital satisfaction in women using Depo Medroxyprogesterone contraceptive method was 116.79+/- 8.62 that was significantly higher than the average marital satisfaction in women using Cyclofem contraceptive method as 114.53+/- 7.16 (P = 0.01).

Side effect	Depomedroi	Cyclofem	P value	Side effect	Cyclofem	Depomedroxi	p value
	%N	%N			%N	%N	
Amenoreha	(74)3/50%	(72) 48%	P=0.77	Painful coit	(8)3/5%	(9)6%	P=0.80
Decreasing days of bleeding	(2)3/1%	(2)3/1%	P=0.99	Lokoreh	(13)7/8%	(6)4%	P=0.09
Breakthrough bleeding	(29)3/19%	(31)7/20%	P=0.77	Decrease libido	(17)3/11%	(21)14%	P=0.48
Increase days of bleeding	(8)3/5%	0	P=0.004	Increase libido	(12)8%	(8)3/5%	P=0.35
Increase bleeding	(2)3/1%	0	P=0.15	Weight Without change	(74)3/49%	(77)3/51%	P=0.72
Regular menstruation	(1)0.3%	0	P=o.31	Increase weight	(51)34%	(50)3/33%	P=0.90
Irregular menstruation	(10)7/6%	(9)6%	P=0.81	Decrease weight	(21)14%	(20)3/13%	P=0.86
Mood Without change	(71)3/47%	(74)3/49%	P=0.72	Hirsutism	(20)3/13%	(17)3/11%	P=0.59
Sensitivity	(23)3/15%	(25)7/16%	p=0.75	Vomiting	(11)3/7%	(11)3/7%	P=1
Easy for crying	(2)3/1%	(3)2%	P=0.65	Headache	(29)3/19%	(31)7/20%	P=0.77
Nervousness level	(25)7/16%	(28)7/18%	P=0.65	Breast tendency	(21)14%	(20)3/13%	P=0.86
Early exhaustion	(24)16%	(16)7/10%	P=0.17	Backache	(35)3/23%	(43)7/28%	P=0.29
Decrease power	(5)3/3%	(4)7/2%	P=0.73	Vertigo	(16)7/10%	(18)12%	P=0.71
Foot muscle contraction	(55)7/36%	(51)34%	P=0.62	Face rush	(12)8%	(14)3/9%	P=0.68
Hair sheding	(22)7/14%	(29)3/19%	P=0.28	Abdominal bloat	(36)24%	(35)3/23%	P=0.89

Discussion

In this study, there was no significant relationship between Amenorrhea, reducing days of bleeding, breakthrough bleeding, bleeding increase, regular and irregular menstrual cycles with Cyclofem and Depo Medroxyprogesterone contraceptive methods. But, increased incidence of bleeding days in Depo Medroxyprogesterone method (5.3%) was significantly more than that in Cyclofem method (0%).

In the present study, the most common menstrual disorder in the consumers of Cyclofem and Depo Medroxyprogesterone was Amenorrhea as 48% and 50.3%, respectively. In a study conducted by Afkarie in Kermanshah.[20] Province, the most common menstrual disorder in consumers of Depo Medroxyprogesterone was amenorrhea as 53.2%; it is consistent with present study. However, according to Yazdan Panah,[21] the most common disorder in the consumers of Cyclofem was the lasted bleeding and then amenorrhea that is not inconsistent with this study; incidence of amenorrhea in Depo Medroxyprogesterone consumers is 50/3% in this study. Similar studies report this amount higher and others have reported it less. Moradan[22] stated the incidence of amenorrhea as 39.2% in Semnan province, and Kamalifard[23] reported it as 50% in East Azerbaijan province. In the present study, incidence of amenorrhea was 48% in Cyclofem consumers while Kamalifard[23] reported it as 22% in East Azerbaijan province and Yazdan Panah[21] announced it as 14.7% in Kerman in his studies. In his study on Iranian women conducting an immunochemistry survey, Symber showed that there is no difference for endometrial and endometrial atrophic vessels density in Depo Medroxyprogesterone and Cyclofem consumers after 3-6 months consumption.[24] In this study, increased nervousness level was the most common type of mood changes in Cyclofem and Depo Medroxyprogesterone consumers as 16.7% and 18.7%, respectively. In his study in Kermanshah, Afkarie[20] reported this level as 25.4% in Depo Medroxyprogesterone consumers that was higher than that in the present study;

perhaps it is due to difference in culture context of the races under study. However, no study was found on mood changes in Cyclofem consumers. In the present investigation, one-year continuation rates of Cyclofem and Depo Medroxyprogesterone in consumers were 62% and 60% respectively. While in his study Kamalifard[23] reported that one-year continuation rate of Cyclofem and Depo Medroxyprogesterone in consumers of these methods are 27% and 42% respectively, Yazdan Panah[21] also stated that one-year continuation rate of Cyclofem is 21.2%. In some studies conducted in Kenya[25], the one-year continuation of Cyclofem and Depo Medroxyprogesterone consumption were reported as 56% and 75% respectively. In a similar study conducted on Muslim countries like Indonesia and Tunisia[26], one-year continuation rate of Cyclofem were reported as 66.5% and 28.2%, respectively. Difference in continuation rates in different studies may be due to cultural, economic and social differences of the population under study as well as the quality of advices before starting to use injection methods. Generally, based on the results achieved in the present and similar studies, the complications occurred by Cyclofem and Depo Medroxyprogesterone ampoules are similar and they have no significant difference; and these complications are not fatal and irreversible. Health staff may help the women using such methods through their advices and adequate training especially about the possible side effects in higher application and continuity of these methods.

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Depression in children and adolescents: family narratives in Brazilian primary attention

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Abstract

Background: The incidence of depression in children and adolescents still increasing and this disorder is now a major public health challenge worldwide. The Psychiatric Reform suggested an end to the fragmented and inefficient service by proposing integrated and quality care. In this context, family narratives are a way to recognize vulnerabilities and provide psychopathology prevention in primary care.

Methods: Two medical databases (LILACS and SciELO) were surveyed and 14 texts published between 2004 and 2011 were selected and reviewed.

Results and discussion: Children and adolescents are nowadays exposed to several stressing factors, in addition to natural vulnerabilities of this age group. Prevention is associated with a qualified hearing of family narratives in primary care and healthcare professionals should be able to perceive said and unsaid elements across the speech.

Conclusion: In spite of the advances about children and adolescents mental health, some procedures must be adapted to achieve an efficient mental health policy though analyzing family discourse.

Key words: Depression, vulnerabilities, family narratives.

Background

The incidence of mental health disorders in children and adolescents became progressively greater along the last decades and constitutes, nowadays, one of greatest challenges for public health worldwide[1]. According to World Health Organization (WHO) data, almost 20% of children and adolescent carry some kind of psychic disease. In Brazil, this index is between 12,7% and 23,3%[2].

Psychiatric care for adults was created in the "century of lights", occupying abandoned leprosariums, but studies about infantile mental health just arose when researchers started to observe marginalized groups in scholar environments. Although Rousseau have proposed a different approach for children, only after one and a half century this idea became part of childhood care[3].

We can say infantile psychiatry originated from two bases: projection of adults' psychopathologic processes and knowledge about childhood intellectual development. First medical practices directed to infantile psychiatrics were inaccurate adaptations of what was known about adults' psyche[3]. Consonant to psychoanalytic and piagetian ideas, the Movement for Mental Health and Dynamic Psychiatry created a proper environment for the ascent of infantile psychiatry in the early twentieth century[4].

In Brazil, for a long time, closed institutions, most of them philanthropic, constituted the only alternative of care for children with mental problems and for their families. Due to this institutionalized care, guided by a segmented idea of youth population, this period was known by disassistance, abandon and exclusion, what characterizes asylar model of assistance[5].

This way, mental health of children and adolescents was marked for a long time by a historic gap, what stimulated the necessity for constructing a new Mental Health Policy, nowadays a priority for WHO. A mark of this change in the care of mental health for this young people was the Psychiatric Reform, occurred along the decade of 1980, simultaneously to Sanitary Reform and focusing in deinstitutionalization, achieved by reducing the number of beds in mental hospitals and by creating a wide range of substitutive communitary services[5].

The model of deinstitutionalization in the care of children's and adolescents' mental health and the creation of Psychosocial Attention Centers (CAPS) in Brazil left in the background the assistance to less injurious and more prevalent mental disorders. For supplying this absence, some documents were developed around 2001 aiming to link basic healthcare attention and mental health. To achieving this goal, guidelines were designed to increase PSF teams' capacity of resolution and give importance to mental health in their training[6].

Nowadays, principles and guidelines for a national mental health policy for children and adolescents in Brazil are under construction, aiming to improve the assistance and guarantee treatment efficiency. In this context, new characteristics will be added to basic attention, looking for changes in the paradigm of assistance and in its model[6].

One of the principles from public mental health policies is to give voice and hearing to patient and its relatives, to trace efficient therapeutic strategies. This way, we highlight the importance of family actions in the process of construction of an effective care for this public. In addition to this, subject's territory should be considered because it is also a psychosocial place and it is inside personal experiences of each individual. These are essential concepts for developing a complete and efficient assistance[7].

Family environment should be comprehended like a space of psychic illness expression, disclosement of emotional needs and intervention. In this context, it is highlighted the importance of family narratives for the craeation of a concept which would consist in the relations between disease, child and family environment. Anguishes which constitute relatives' discourse compose a kind of reality representation, what is important to structure preventive and therapeutic actions[2].

Family discourse describes, expresses and represents experiences of the disease process of depressive child. It presents, therefore, significant relevance for the improvement of researches about mental health of children and adolescents. Children and adolescent require special attention about prevention and treatment of mental disorders, because its consequences can be serious damages in their development processes[8]. That is why it is important to deepen this kind of studies.

It is necessary to maintain a dialogue regarding to practices about mental health of children and adolescents, evoking the problem of childhood depression and the relevance of family discourses as a tool for detecting and comprehending the psychic illness of these young people and their relatives. We tried here to demonstrate the importance of the attention to narratives for the identifying vulnerabilities and the structuring the prevention of childhood depression.

Methods

This is a literature review structured by articles extracted from two virtual databases (LILACS and SciELO) related to the focused subject. Was selected fourteen texts (twelve articles and two thesis) published between 2004 and 2011. The following keywords were used in the search: mental health, children and adolescent, prevention, vulnerabilities, basic healthcare and family narratives.

Results and discussion

Evolution in the healthcare system and in the therapeutics favored a decrease in children mortality. This way, children who were susceptible to death in elder times survived and were exposed to stressing factors related to environmental unhealthy conditions, like violence, urbanization, poverty, lack of food or family instability. To this scenario, we can add situations of abuse, mistreating and negligence. In a general manner, psychiatric disorders in children and adolescent not just affect their relationships with friends and family, but extend to future life as possible predispositions for psychopatologies[9].

Some studies highlight that a low socioeconomic level can act as a conditioning for mental health problems in children. Born into poverty and inhabit in a unfavorable family environment are high risk conditions, but some individuals have a characteristic called resilience, defined as the capacity of overpassing some situations or risk factors without injuries, in this case, for mental integrity. Opposing to the concept of resilience is the one of vulnerability, as an increased susceptibility for injuries facing unfavorable situations[9].

Mental health in child is strongly influenced by social and psychological environment, more than

by intrinsic factors of the individual. It is demonstrated a relevant association between family characteristics and infantile mental disorders, highlighting unemployment and parental divorce as the most notable risk factors[9]. Therefore, professionals of primary healthcare should be able to detect in the discourse traces of instability in the dynamics of parental relationship, to act mitigating possible injuries caused by disorder progression in family environment.

In a study performed by Nakamura and Santos[10], is perceived that relatives' speech, notably parents', is loaded of implicit meanings, which should be efficiently detected and comprehended. One example is the following speech pinched from referred study: "I felt so upset [...] you know when you think 'there's no solution'? That was how I felt". The problem clearly lost control, with doubts and lack of experience turning into desperation, fear and anger. Basic healthcare services should be able to infer how much vulnerable is this family, whose inadequate support to the young person with mental disorder needs professional help.

According to Ferrioli et al[11]., the recognition of mental health problems should occur at primary attention level. Evaluate psychiatric problems and associated conditions are a necessary step for planning healthcare actions. Redirecting these interventions over development problems makes necessary a wide knowledge about infantile development questions, determinant factors, early deficit signals and efficient intervention mechanisms[12].

Studies related to violence against children and adolescents presents worldwide variations. In United States, family violence affects tem million homes annually. In Brazil, violence is also very common in youth's daily life and parental aggressions against children deserve attention, especially in low income social groups[13].

Therefore, problems related to different kinds of violence are good examples of vulnerabilities presented by the family looking for basic attention. This violence is presented to the service through several ways, some of them clear and other harder to detect. Family speech consists in an important tool for make possible such detection, trough fragmented complaints like: "he fell down and hit the head on the floor" or "he has problems to sleep".

Primary services professionals' inability is the main reason because when a child with development problems of even physical lesions undergoes to an organic treatment or is submitted to other professionals and long waiting periods. This discrepancy in the shelter of such complaints due to the lack of comprehension about the extended health-disease model and the inability to face questions that overpasses biomedical paradigm. The problem of family violence, for example, contemplates biological, emotional and social aspects[6].

It is important to perceive that both victimization and violence witnessing can blur children's and adolescents' feelings and perceptions. For understanding the intensity of mental integrity injuries, we need to evaluate occurrences context, individual characteristics and relationship with the aggressor. A study performed in the United States disclosed that martyrization and testifying are related to symptoms of psychic illness, like anxiety, depression, intrusive thinking and sleep disorders[13]. This is the importance of recognition when such situation is present in the context of basic healthcare attention.

Prevention of emotional and behavioral disorders in children and adolescents needs a clear knowledge about individual and environmental conditions which produces risk and protection to several psychopathologies.

Beside of identifying family vulnerabilities in between the discourse, it is important to incentive active search for information about population's life and mental health conditions in the area assisted by primary healthcare team, aiming to embase actions compatible to their necessities[11]. This conduct becomes relevant when the team detects the discourse of "it is not necessary" as the main reason because of families do not ask for help. Many families, notably of younger children, give less importance to symptoms, believing that they will vanish along time or that they are common.

The analysis of narratives, embraced by the disease and its meaning, is important to streamline ways to make possible a healthy living, in addition to parental habits which help the child and allow the establishment of a dialogue between the child and adolescent and those who surround him.

As it is important to know how to analyze family discourse, the comprehension of narratives

presents itself as a relevant strategy to interpret what relatives are saying and doing in determinate situations and, in this way, to identify possible deficiencies in the family environment. This perspective, in the context of basic healthcare attention, refers to sheltering and acceptation as something that just floats over the ideological field. This hearing don't refers just to the single mechanic act of audition, but, extensively, to interpret and give something to who is saying it.

Considering peculiar aspects of this pathology, we have the terms "childhood depression" and "discourse" effectively inside the corpus of family narratives, which is full of said and unsaid expressions, able to give to primary attention professionals some consistent subsidies for the treatment of disease[2].

Front of this problem, it is necessary to give value to hearing as a mechanism for treating and preventing depression. Specially because the patient with depression is extremely needful of attention and this hearing gives a considerable mitigation in the "pain of being".

The creation of prevention services for childhood mental disorders, in addition to mitigate child's and its relatives' suffering, reduces the overload of specialized services, through a more simple and effective attention, as proposed by Brazilian Family Health Program (PSF)[11]. Therefore, the qualified hearing of family narratives, the compromise of healthcare professionals and the community involvement are essential tools for basic attention to be able to recognize factors which turns children and adolescent more susceptible to development of depression, guiding preventive actions[14]. It makes easier the planning of intervention strategies more appropriate to the culture of target-population and identifying barriers to program's implementation.

Conclusion

The intervention over risk factors and action mechanisms which interferes in children's mental health overpasses healthcare. It is necessary to stimulate interdisciplinary approach, involving healthcare, education, social assistance, economy, infrastructure and the generation of jobs and income.

Childhood psychiatric illnesses configure a relevant problem for public health and deserve attention and reflection from all of professionals who are involved with integral attention to the health of children and adolescents.

In spite of achieved advances, the construction of a public mental health policy directed for children and adolescents stills a great challenge. Through recent studies regarding to this area, we can understand that the hearing, materialized by family narratives in the context of basic healthcare attention, represents an important instrument of contribution to this new policy, which walks in large steps in the direction of a efficient and consistent attention.

Authors' contributions

MLRN and AOAR and JCA designed the study, and wrote the manuscript. MLRN and MLAF assisted in the writing of the manuscript. MLRN and LCA coordinated the study. All authors read and approved the final manuscript.

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Physical injuries of homecare Korean patients with senile dementia

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Abstract

The study sought to provide the necessary information for protection of homecare Korean patients with senile dementia by analyzing real events using an accident survey. A questionnaire was completed by 55 homecare Korean patients with senile dementia. Frequency analysis and cross-tabulation frequency analysis was performed for the cause, type, and body region of physical injuries, and the location of accident. The most common causes of physical injuries, in order of frequency, were tumbling, then colliding, slipping, and falling. The most common types of injuries were, in order, bruise, abrasion, sprain, fracture, and burn. The body part where the physical injury occurred most frequently was knee, followed in order by head, shoulder, hand, waist, arm, femoral region, shank, hip, foot, abdomen, and tooth. In order of frequency, accidents occurred around the home, bathroom, stairs, yard, living room/ bedroom, and kitchen.

Key words: Senile dementia patients, Homecare patients, Physical injuries, Accident survey

Introduction

Since senior patients with dementia have cognitive, mental, physical, and behavioral defects, they can be more frequently exposed to dangerous situations with a greater possibility of physical damage (1, 2, 3). Previous studies concerning senile dementia have addressed behavior problems (4, 5, 6, 7, 8), and factors related to performance deterioration (9, 10, 11, 12) and prediction of danger (2). However, information concerning senior homecare patients that can help during their daily lives is lacking.

Recently, important problem features of Korean dementia patients residing in a welfare facility were investigated and their associated degree of risk for injury was evaluated (2). The risks, in descending order of influence, were predicted to be perception problems (memory, judgment, cognition disorders), coping with daily life (difficulty in dressing, using the toilet, diet, or walking), behavior problem (wandering, violence), and mental problem (e.g., depression). However, the results were derived only from elderly welfare facility patients, and only predicted the degree of risk level with the important problem features. No information from real accident cases has been published.

To better understand the real-life risk factors for elderly patients with dementia in various environments, more information is needed from welfare facilities as well as the homecare environments, from real accidents, and concerning the types and locations of physical injuries. These aspects were presently studied in homecare Korean patients with senile dementia.

Methods

A survey questionnaire about accident cases was constructed with the combined advice of specialists in literature surveys and previous study results using the Delphi method. Questionnaire modification and pilot testing was done. Once the questionnaire was deemed suitable, it was deployed to solicit information from the principal care-givers of homecare patients with senile dementia. Responses concerning the location of accident, causes of physical injuries, types of injuries, and involved body parts were analyzed.

Subjects

The survey was conducted by visiting the patients' dwellings. The questionnaire was completed by 55 homecare Korean patients with senile dementia (average age: 75.9±7.0 years) including 16 males (average age: 73.5±7.9 years) and 39 females (average age: 76.7±6.6 years). The principal caregivers comprised daughter-in-law (24%), spouse (23%), daughter (23%), son (13%), relative (6%),

and others (11%). These care-givers consented to complete the questionnaire following a detailed explanation about the survey and its' purpose.

Survey questionnaires and analysis

The survey solicited personal information (sex, age, education, spouse, religion, and standard of living), dwelling pattern (cohabitant and housing type), and the dementia condition (cause, period, and level of dementia). Based on previous studies (5, 6, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22), the questionnaire items and format concerning accident cases were selected and preliminary questions were prepared by consulting with relevant specialists. To test the reliability of the preliminary questionnaires, a pilot survey was performed by visiting eight patient's houses and interviewing the principal care-givers. The eight patients in the pilot study had an average age of 75.9±5.2 years, and included two males (average age: 81.0±1.0 years) and six females (average age: 74.1±4.9 years). The responses of the care-givers were used to modify the questionnaire in a way that was more relevant and for the other principal care-givers who were subsequently polled. Each questionnaire included illustrated instructions to aid in completion. The final version of the questionnaire was used to solicit information on the time, place, cause, and type of accident, and the affected body region. Frequency analysis was performed for the cause, type, and body region of each physical injury, and the accident location. Cross-tabulation frequency analysis was also performed for the cause, type, and body region of each physical injury.

Results

The basic features of Korean patients with senile dementia who participated in this study are described in Table 1. Patients were mainly educated to the elementary or middle school level (65.5%), were widows/widowers (49.1%), professed a religious affiliation (76.4%), middle-class in their living standard (60.0%), and lived with their family (58.2%). Every dwelling was equipped with kitchen and restroom.

The cause of dementia was vesicular (30.9%), senile (25.5%), Alzheimer's disease (23.6%), and others (18.2%). The period of dementia was between 1–5 years (52.7%), <1 year (21.8%), and 5–10 years (20.0%). The level of dementia was in progress (56.4%), stable (30.9%), and variable (12.7%).

Table 1. Basic characteristics of senile dementia patients

Basic features	Division	Number (%)
Education	Over high school	11 (20.0)
	Elementary or middle school	36 (65.5)
	Uneducation or illiteracy	8 (14.5)
Spouses	Single	7 (12.7)
	Living spouse	19 (34.5)
	Dead spouse	27 (49.1)
	Other	2 (3.6)
Religion	Religion	42 (76.4)
	No professed religion	13 (23.6)
Standard of living	High	1 (1.8)
	Middle	33 (60.0)
	Low	21 (38.2)
Cohabitant	With family	32 (58.2)
	With spouse	11 (20.0)
	Alone	6 (10.9)
	Other	6 (10.9)
Housing type	Single-family house	26 (47.3)
	Apartment	23 (41.8)
	Row house	3 (5.5)
	Other	3 (5.5)
Cause of dementia	Vesicular	17 (30.9)
	Alzheimer	13 (23.6)
	Senile	14 (25.5)
	Others	10 (18.2)
	Unidentified	1 (1.8)
Period of dementia	<1 year	12 (21.8)
	1–5 years	29 (52.7)
	5–10 years	11 (20.0)
	>10 years	3 (5.5)
Level of dementia	In progress	31 (56.4)
	In stable	17 (30.9)
	In variation	7 (12.7)

Body region where physical injuries occurred most frequently was knee (28.4%), head (13.4%), shoulder (10.4%), hand (10.4%), waist (9.0%), arm (7.5%), femoral region (7.5%), shank (6.0%), hip (3.0%), foot (1.5%), abdomen (1.5%), and teeth (1.5%) (Table 2). The most common cause of physical injuries was tumbling (50.7%), colliding (28.4%), slipping (16.4%), and falling (4.5%)

Table 2. Frequency analysis and cross-tabulation frequency analysis of causes, types, and body parts of physical injuries (unit: %)

			Body region											
			Head	Tooth	Shoulder	Hand	Arm	Knee	Foot	Shank	Waist	Hip	Femoral region	Abdomen	Total
			13.4	1.5	10.4	10.4	7.5	28.4	1.5	6.0	9.0	3.0	7.5	1.5	100
Cause	Tumbling	(50.7)	8.8	0	14.7	8.8	5.9	23.5	0	11.8	8.8	5.9	11.8	0	100
	Colliding	(28.4)	26.3	5.3	10.5	10.5	10.5	26.3	5.3	0	0	0	0	5.3	100
	Slipping	(16.4)	9.1	0	0	9.1	9.1	45.4	0	0	18.2	0	9.1	0	100
	Falling	(4.5)	0	0	0	33.4	0	33.3	0	0	33.3	0	0	0	100
	Total	(100)													
Type	Bruise	(51.9)	14.6	0	9.8	14.6	2.4	39.1	0	0	4.9	4.9	7.3	2.4	100
	Abrasion	(30.4)	12.5	0	4.2	8.3	8.3	33.4	0	8.3	4.2	8.3	12.5	0	100
	Sprain	(11.4)	0	0	11.2	22.2	0	22.2	0	0	44.4	0	0	0	100
	Fracture	(5.0)	25.0	25.0	0	0	0	25.0	0	25.0	0	0	0	0	100
	Burn	(1.3)	0	0	0	0	0	0	100	0	0	0	0	0	100
	Total	(100)													

(Table 2). The body parts most affected by physical injuries were, in decreasing order of involvement, knees, due to tumbling, colliding, slipping, and falling; shoulder, due to tumbling; head due to colliding; waist due to slipping; and waist and hand due to falling in order. The most common types of injuries were bruise (51.9%), abrasion (30.4%), sprain (11.4%), fracture (5.0%), and burn (1.3%) (Table 2). The most common injury region due to bruising was the knee, followed by the head and hand. The most common abrasion-related injury region was the knee, followed by the head and femoral region. The most common injury region due to sprain was the waist.

In decreasing order of frequency of occurrence, the order of the location of the accidents was around the home (22.9%), bathroom (18.8%), stairs (16.7%), yard (14.6%), living room/bedroom (14.6), and kitchen (12.5%). The occurrence of the accidents was similar between the dwelling exterior (54.2%) and interior (45.8%).

Discussion

The purpose of this study was to analyze causes of physical injuries, the types of accident, affected body parts, and the accident locations based on real accidents of homecare Korean patients with senile dementia.

Tumbling, colliding, slipping, and falling directly caused physical injuries to dementia patients. In this population, these injuries are likely a consequence of the deterioration in cognitive function of risks, and diminished reflexes and motor function (2). Presently, the most frequent accident was tumbling and this type of accident injured the most body regions.

Presently, the physical injury was most often the result of bruising and abrasion (82.3%). There was no great difference in injured body parts between upper (44.7%) and lower (55.4%) extremities. In the upper extremities, the order of incident frequency was head, shoulder, and hand. In lower extremities, the order was knee, waist, and femoral region. Protective outfitting including knee protection could be a prudent preventative strategy, if acceptable to the subject.

Accidents tended to occur most often around home. This generalized descriptor included the

exterior and interior of dwellings. Injuries identified as occurring inside dwellings mainly involved the bathroom and consisted mainly of tumbling or colliding. The bathroom-related injuries involved water or cognitive and physical problems.

In these settings, bruising and abrasion, particularly of the knees, was common. These injuries were high in incident frequency but not in risk level. After the knee, body regions most frequently affected by tumbling-related injury were the buttock and the femoral region (17.7%). The latter is the region where the hip joint is located, and fracture of this joint is closely related with mortality of the elderly. A recent study about hip joint fracture showed that 90% of affected patients were over 60-years-of-age (23). Improper treatment of hip joint injuries induces complications that can affect the entire body, increasing the risk of death. In one study, three among 100 patients over 50-years-of-age with hip joint injuries died within the following year, and, for those who were over 70-years-of-age, the probability of death within the next 2 months reached 50% (23). Therefore, for senile dementia patients, hip joint injuries are a very important accident that is closely related with mortality.

This study provides basic information about monitoring factors that could be valuable in protecting senior patients with senile dementia. The results could be used to develop the application of ubiquitous technology for the protection of senior patients without the limitations of time and place, by monitoring the behavioral and physiological information in real-time. The telemedicine system (24), lost-preventing system (25) using the mobile communication and geographic information systems, and the motion detector system using an infrared sensor (26) are under development to monitor physiological change and behavior. Our results could aid in the development of these technologies for determining the monitoring elements, priority, place, and range. However, the application of these technologies must consider a patient's privacy and human rights.

Since this study investigated only 55 senile dementia patients, more information from many more patients, and considering factors such as race and culture, and economic factors will be required before definitive conclusions can be made.

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Mean platelet volume is incresed in patients with chronic Hepatitis C

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Abstract

Background: Hepatitis secondary to infection with the hepatitis C virus (HCV) is one of the most common causes of viral hepatitis worldwide. Multiple extrahepatic manifestations of HCV infection have been recognized. However, the effect of HCV infection on the mean platelet volume (MPV) is unknown. The aim of this study was to assess the mean platelet volume (MPV), an indicator of platelet activation, in patients with chronic hepatitis C.

Patients and Methods: The study group consisted of 42 patients with chronic hepatitis C. An age, gender, and body mass index-matched control group consisted of 50 healthy volunteers. All patients and control participants underwent echocardiographic examination. We measured the serum MPV values in patients and control participants.

Results: Mean platelet volume was significantly higher among patients with ASA when compared with the control group (9.9±2.5 vs 7.2±1.7 fL, respectively; P<0.001).

Conclusion: We have shown that MPV was significantly elevated in patients with chronic hepatitis C compared to control participant. According to our knowledge, there has been no previous study of MPV in chronic HCV patients. Therefore, we have investigated the possible association between HCV infection and MPV.

Key words: platelets; arrhytmia; Hepatitis C virus; mean platelet volume; thromboembolism.

Introduction

The Hepatitis C virus (HCV) infection is a major public health problem worldwide. It is known that chronic HCV infection triggers autoimmune disorders. A strong relationship has been found with essential mixed cryoglobulinemia, glomerulonephritis, and porphyria tarda. Additionally, HCV infection has been associated with extrahepatic involvements such as Sjögren's syndrome, lichen planus, and Hashimato's thyroiditis (1, 2).

Recent studies revealed that the virus has extensive reservoirs of extrahepatic replication. Hepatitis B virüs (HBV) and HCV proteins and nucleic acids have been found in a number of non-hepatic tissues including lymph nodes, spleen, bone marrow, kidney, colon, stomach, periadrenal ganglia, skin, thyroid, pancreas, testis, ovaries, brain, heart and lung tissue (3-6). It is also considered that there is a relation between HBV and HCV and coronary artery disease. Conflicting findings on the possible association between HBsAg positivity, indicating inactive HBsAg carrier status, and atherosclerosis have been reported (7-9). However, there is no consensus on this issue.

Recent studies suggest that mean platelet volume (MPV) is a potentially useful prognostic biomarker in patients with cardiovascular disease such as acute coronary syndrom, valvular heart disease pulmonary thromboembolism and hypertension (10-13).

To our knowledge, there has been no study evaluating MPV in HCV patients. Our present study was conducted to research the effect on MPV among the persons with HCV infection.

Methods

Selection of the patients

42 patients mean age was 45±15 years (range: 24-60 years.), who has been followed in the outpatient clinic of infection diseases department because of the chronic hepatitis C (anti-HCV and HCV-RNA positive for at least 6 months), has normal liver enzymes and has not received antiviral treatment, are included in the study.

The control group was consisted of 50 successive persons, mean age was 39±13 years (range: 20-57 years) who appealed to the cardiology and Infectious disease outpatient clinic because of va-

rious reasons and did not have any structural cardiac pathologies identified.

A physical examination, the medical history of patients, and the blood biochemistry were evaluated in all groups. The subjects were defined as hypertensive if their blood pressure was ≥140/90 mmHg or if they were receiving any antihypertensive medication. Diabetes mellitus was defined as the presence of a history of antidiabetic medication usage or fasting glucose level above 126 mg/dl. Smoking status was classified as smokers or those who never smoked.

Patients with coronary artery disease, heart failure, valve disease, cardiomyopathy, hypertension, diabetes mellitus, chronic lung disease, thyroid dysfunction, anemia, malignancy, renal and hepatic insufficiency, chronic inflammatory disease, pregnancy, septicemia, cerebrovascular accident, and thrombocytopenia were exluded from the study. All of the patients were in sinus rhythm and none of them were taking cardioactive medications like antiarrhythmics, antiplatelet, antipsycotics, and antihistaminics. Every patient signed an informed consent form and the local ethics committee approved the study.

For the analysis of MPV, blood samples with K3 EDTA were analyzed after one hour of venipuncture by the Sysmex XT-2000i analyzer (Sysmex, Kobe, Japan).

Echocardiographic Measurements

Two-dimensional, M-mode, pulsed and color flow doppler echocardioagraphic examinations of all subjects were performed by the same examiner with a commercially available machine (Vivid 7 pro, GE , Horten, Norway, 2-5 mHz phased array transducer). During echocardiography, a single-lead electrocardiogram was recorded continuously.

M-mode measurements were performed according to the criteria of the American Society of Echocardiography (14,15).

Theright atrium, left atrium (LA) diameter, LV end-systolic and end-diastolic diameters were measured. LV ejection fraction (EF) was estimated by Simpson's rule.

Statistical Analyses

The SPSS 16.0 statistical program (SPSS, Chicago, IL, USA) was used for the statistical study. Data were expressed as mean±standard deviation (SD). Student t-test, one-way ANOVA and chi-square test were used to compare the variables. A P value of less than 0.05 was considered significant.

Results

There was no statistically significant difference between patient group and the control with regard to age, gender, diameters of the left atrium, right atrium and the left ventricle, pulmonary artery systolic pressure and body mass index (Table 1). Additionally there were no significant differences between the to groups with regard to lipid profile, fasting glucose levels,creatinin, white and red blood cell and platelet counts. However, MPV was found to be significantly higher in patients with HCV infection (9.9±2.5 fl vs 7.2±1.7 fl, $p<0.001$). (Table 2).

Discussion

Recently, it has been emphasised the importance of HCV infection in myocarditis and cardiomyopathy. HBV and HCV has been associated with atherosclerosis and HCV sero-positivity in the patients with coronary artery disease and this was found to be related to cardiac failure and increased mortality (16, 17). Turhan et al. (9) found high mean platelet volume (MPV) values, the indicator of susceptibility for atherothrombosis in the HBV patients. However, the effect of HCV on the MPV has not been known.

Matsumori et al. (6) found anti-HCV positivity in 10.6% of the patients with hypertrophic cardiomyopathy and in 6.3% of the patients with dilated cardiomyopathy. Additionally, they found arrhythmia in 21.5% of anti-HCV positive patients; hence, the authors suggested that HCV might play a role in several cardiac disorders with formerly unidentifiable etiology .

In our previous study, an association was also found between HCV infection and the left ventricular hypertrophy, in terms of the left ventricular systolic and diastolic dysfunction (1, 18). There are some conflicting studies in the literature about the relation between HBV/HCV and atherosclerosis and coronary artery disease (7, 8, 19).

Wang et al. (20) found higher NT-proBNP levels, increasing with the heart failures in the HBV/

Table 1. Comparison of clinical and echocardiographic features of HCV patients and controls group

	Patients (N=42)	Controls (N=50)	P-Value
Age (years)	45 ± 15	39 ± 13	NS
Male/female(n/n)	16/26	22/28	NS
LA diameter(mm)	32.5 ± 3.2	34.2 ± 3.6	NS
LV EDD (mm)	44.1 ± 4.1	44.2 ± 4.5	NS
LV ESD (mm)	22.5 ± 2.5	24.4 ± 2.7	NS
RA diameter (mm)	33.3 ± 3.3	32.8 ± 3.0	NS
LVEF (%)	64.0 ± 5.4	64.8 ± 5.9	NS
BSA (m2)	1.9 ± 0.4	1.8 ± 0.3	NS
Heart rate (bpm)	77.6 ± 9.2	69.3 ± 8.3	NS
SPAP (mmHg)	27.5± 3.7	25.4 ± 3.4	NS
SBP (mmHg)	122.2 ± 23	122.5 ± 24	NS
DBP (mmHg)	73.2 ± 10	79.3 ± 12	NS
BMI (kg/m2)	26 ± 4.5	24 ± 3.1	NS
Smoking (n)	9	12	NS

LA: left atrium, LVEDD: left ventricular end-diastolic dimension, LVESD: left ventricular end-systolic dimension, RA: right atrium, LV EF: left ventricular ejection fraction, BSA: body surface area, SPAP: systolic pulmoner artery pressure, SBP:systolic blood pressure, DBP: diastolic blood pressurei, BMI: body mass index.

Table 2. Comparison of biochemical parameters of HCV patients and controls group

	Patients (N=42)	Controls (N=50)	P-Value
Glucose(mg/dl)	95.1 ± 12.2	93.5 ± 11.0	NS
Creatinin(mg/dl)	0.8 ± 0.2	0.75 ± 0.3	NS
Total cholesterol(mg/dl)	199 ± 54	195 ± 52	NS
Trigliserid(mg/dl)	127 ± 29	125 ± 23	NS
HDL- cholesterol(mg/dl)	46.8 ± 8.5	44.2 ± 7.5	NS
White-blood cell count ($x10^3/mm^3$)	8.5 ± 2.5	8.6 ± 2.6	NS
Hemoglobin (g/dl)	14.2 ± 2.7	13.3 ±2.2	NS
Platelet count($x10^3$)	258.5 ± 72.1	282.3 ± 89.3	NS
Mean platelet volume (fl)	9.9 ± 2.5	7.2 ± 1.7	<0.001

HCV patients not having liver failure, in comparison with the control group. Similarly Kucukazman et al. (21) found higher BNP levels in asymptomatic hepatitis B virus positive patients. According to this situation, it is considered that both HBV and HCV infections may increase heart failure. Despite a large number of studies done about the relation between cardiomyopathy, myocarditis and heart faliure, the data about cardiac effects of HCV is limited.

Recent studies suggest that mean platelet volume (MPV) is a potentially useful prognostic biomarker in patients with cardiovascular disease such as acute coronary syndrome, valvular heart disease pulmonary and systemic thromboembolism and hypertension (22). However relationship between MPV and chronic HCV infection is not defined.

The present study showed that MPV was significantly higher in patients with chronic HCV infection compared to controls. It is known that platelets having dense granules are more active biochemically, functionally, and metabolically and are a risk factor for developing coronary and pulmonary thrombosis, leading to myocardial infarction. In previous studies, increased MPV was demonstrated in acute myocardial infarction (23, 24), mitral and aortic stenosis (10, 11), deep vein thrombosis (12), hypertension (13) and inctive hepatitis B (9). The stroke in patient with ASA, platelet activation may play a considerable role larger platelets secrete high levels of prothrombogenic thromboxane A2, serotonin, beta-thromboglobulin, and procoagulant membrane proteins like P-selectin and glycoprotein IIIa (24).

In this comprehensive study, we have demonstrated that MPV significantly higher in HCV patients than the control subjects and it is thought that this may be related to thromboembolism more common in those patients.

The most significant limitation of our study was the insufficient number of patients. The other-limitations of our study was not prospective.

In conclusion, our findings show that MPV is increased in patients with chronic HCV infection, compared to controls. The incresed MPV to predict the increase in the prevalence of thromboembolism in patients with HCV. Further prospective studies are required to establish the clinical significance of increased MPV and to investigate the role of anti-platelet agents in chronic HCV patients.

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Using transcutaneous electrical nerve stimulation on acupuncture points for labor augmentation

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Abstract

Background: Drug using such as oxytocin for labor augmentation has many adverse outcome for both mother and her neonate.

Aim & objective: This study has been performed with aim of assessing the efficiency of transcutaneous electrical nerve stimulation (TENS) on specific acupuncture points to reduce the labor augmentation with oxytocin.

Methods: This study was a double-blind, placebo-controlled trial study. we assigned 64 nulliparous women, randomly who were in the first stage of labor. According to TENS on four acupuncture points (Hegu [LI-4] and Sanyinjiao [Sp-6]) (n=32) or the TENS placebo (n=32). Time of the first stage of labor and need to augmentation labor with oxytocin assessed in two groups. Finally, data was analyzed by SPSS (T-test and $\chi 2$). Statistical significance was defined as $P<0.05$.

Results: TENS group decreased the need for labor augmentation. (16 (50%) in TENS and 25 (78.1%) in TENS placebo group, P=0.019) The first stage time was shorter in the TENS group than in the placebo group. (180min in TENS and 238 min in TENS placebo group, $P<0.000$).

Conclusion: TENS used on acupuncture points could be a good alternative or complement to those parturients who seek an alternative to pharmacological labor augmentation in childbirth without any side effects on mother and fetus.

Key words: TENS, acupuncture points, labor augmentation

Introduction

The labor length is one of the effective factors on labor results and the harms to the mother and fetus as having extra long labor increases the probability of infection, physical and neurotical risks and death in fetus and newborn infant. In mothers increase the risk of, postpartum bleeding and infection and mental confusion caused by nervousness, insomnia and tiredness. (1) The various study results pretend that oxytocin which is a medicine used for infusion and labor reinforcement, in many cases, comes with mother and baby`s complications like water poisoning and infant`s hyper bilirubinemia. (2)

TENS has been used in China for thousands of years and has been more preferable to use in pregnancy medical science and labor since some decades ago. (3) Acupuncture has been used as one of the non medical methods to relieve the pain and to decline the labor length. (4) Acupuncture is effective in labor excursion because it stimulates the points which cause increasing in exuding the labor facilitating hormone. The mentioned hormone exudes a little in a normal situation and only causes the progress in labor stages , although its increasing amount in blood can also have pain relieving effect. (5)

The results of Romnero`s(et al) studies showed that acupuncture could be used as a non drug treatment to decline the labor pain and uterus contraction reinforcement. (6) The history of TENS using comes back to the late 1970s. This method is one of the best labor pain relievers because it is non drug method and there is no limitation in its using.

By analyzing of the previous 19 studies which had studied the TENS effect in decreasing the labor pain in 1671 pregnant women, the investigations showed that using this method can decline the labor pain as well as labor length by the aid of transcutaneous electrical nerve stimulation .There has been no risk for mother or baby by using this method. (7) Fox (et al) claimed the combination usage of TENS and acupuncture to treat the back ache. In their studies, they found that there would be the better result by mixing TENS and acupuncture than that of each one individually. (8)

Dunn (et al) studied the effect of TENS on acupuncture points in order to labor infusion in post term pregnancies. They found that using TENS in acupuncture points in post term women would result in raising in uterus contraction intensity and time and decline the cesarean rate in post term women. (9)

Chao (et al) reported in their research results that using TENS on acupuncture points could only result in labor pain decline but it wouldn`t have any effect on the first stage of labor.(10) Regarding to the existed opposite results, researchers decided to make randomized double blind clinical trial by the combination of acupuncture and TENS to find out its effect on declining the first stage of labor length and the need to labor augmentation by Oxytocin.

Materials and methods

There were 64 healthy nulliparous women in spontaneous labor enrolled in clinical trial double–blinded study at Razi Hospital in Iran. Parturients randomly received TENS on acupuncture points or TENS placebo. Patients were selected according to inclusion (nulliparous patients who had term gestational age, were in active phase of labor with cervical dilatation of ≤5cm without epidural analgesia, had singleton pregnancy and fetal vertex presentation and had the age between 20-34 years and no experience in acupuncture or TENS already) and excluded criteria of the samples was included these cases: smoking and addicted women, suffering from known physical and mental diseases including all heart, renal and immune diseases, all kinds of cancers, hepatitis and diabetes mellitus, maternal skin lesions on the application sites and maternal use of pacemaker.

Labor augmentation was administered to achieve three uterine contractions in 10 min in the first stage.

After their agreement to entering the study, they were divided into two groups.

A portable battery-powered TENS unit had two pairs of electrode-pads placed on the skin (NEW-DYN 620F, Iran). The current output was individually titrated, with intensity at 15 milliampere (mA), a frequency of 100 Hz with a burst frequency of 2 Hz (dense-dispersed waveform), pulse duration (0.25 ms) was used 20 minutes on and 20 minutes off regularly. Four electrodes were used at bilateral LI- 4 (Hegu) points (midpoint between the first and the second carpal bones, the first web space dorsal side) and Sp-6 (Sanyinjiao) points [3 Cun (4 finger of the same person) above medial malleolus in lower leg]. In The TENS placebo group did not received any electrical stimulation.

We compared the need for labor augmentation and time from starting study up to the first stage ending in two groups. Data was recorded in the special forms according to our variables. We also compared neonatal birth weight and Apgar score in two groups. The demographic characteristics collected in questions were taken and analyzed by SPSS (students t-test and $\chi 2$). Statistical significance was defined as $P<0.05$. This study was done after getting the licence from ethical committee of Islamic Azad University, Sari Branch, Iran.

Results

Our study was included parturients from October 1, 2008 to December 30, 2008. 69 parturients were enrolled in this study, 34 women were randomly assigned to TENS, and 35 women to the TENS placebo group. Three parturients had emergency section and One parturient had occiput posterior presentation and One parturients had breech presentation and was unable to complete. The total of 64 women were eligible for evaluation. There was no significant difference in age, gestational age, body mass index,neonatal birth weight and diameter of cervical dilatation at enrollment between the two groups. (Table 1)

There was no significant difference in The median Apgar score at 1 and 5 min of each group. In these two groups, there was statistically significant difference in time from starting study up to the first stage ending. Time in the TENS group was shorter than Sham TENS group ($P<0.000$). The need for labor augmentation in the TENS group was decreased ($p=0.019$). (Table 2)

Discussion

The findings resulted from this study showed that two groups had statistically significant difference in the average length of the labor first stage as the average length in this stage was 180.9±25 minutes in TENS group and 238.2±3 minutes in the TENS placebo group.($p<0.000$).There was

Table 1. Demographic charactristics in TENS and TENS placebo groups

Demographic Characteristic	TENS(n=32)	TENS placebo(n=32)	P-value
Age(years,mean[SD])	28.4± 2.19	27.6± 2.1	0.157
Body mass index (mean[SD])	26.5k± 1.3	26.3 ± 1.3	0.319
Gestational age	39.0± 0.9	39.10.6±	0.429
Cervical dilatation at enrollment	4.3± 0.4	4.2± 0.4	0.273
Birth weight(mean[SD])	3285± 353	3301± 470	0.881

Table 2. Pregnancy outcome in two groups

Pregnancy outcome	TENS	TENS placebo	P-value
Time from starting study to the end of the first stage(mean[SD])	180.925±	238.2± 30.7	<0.000
Augmentation of labor	16(50%)	25(78.1%)	0.019
Apgar score at 1 min(median[range])	8.9(8-9)	8.9(7-9)	0.703
Apgar score At 5 min(median[range])	9.9(9-10)	9.9(9-10)	1.00

also the need to labor augmentation by oxytocin (P=0.019) was statistically significant shorter in TENS group than in TENS placebo group.

Kaplan (et al) studied the role of TENS to reduce the phase length of labor first and second stages. They got that TENS could cause the labor length decline during the first and second labor stages as well as less need to oxytocine. This result is in coordination with the present research results. (11) Lee`s(et al) research results confirms the TENS effect on making the labor first stage length. (3)

Park (et al) has claimed that acupuncture can cause the womb contraction intensity without any effect on labor time. (12) In park`s (et al) studies there is the total length of labor first and second stage but in the present study, the first labor length is considered and probably because of this reason, this study results do not have any coordination with the present research results.

Skilnand`s (et al) research showed that there was less need for oxytocine in comparison with the sample group following the pressure on Sanyinjiao points. Skilnnad (et al) attributed this result to the effect of acupuncture in Sanyinjiao point to make PG F2α and β endorphin free and to help cervix effacement and dilatation. (13)

Dunn (et al) studied the effect of TENS on acupunctural points in post term women in order to labor induction. They found that using TENS in acupunctural points might cause increasing in womb intensity and contraction time and the need to Oxytocin and also cesarean rate would be decreased in post term women. (9)

In the present research, there was no difference in the pain average in two groups in the beginning of interference and 6-7 cm dilatation but in 9-10 cm dilatation (P<0.000) it was significantly less in TENS group than TENS placebo group.

Chao`s (et al) study in 2007 showed that during labor, using TENS on acupunctural points can significantly cause pain reduction during the first stage of labor. In their studies, they explained how TENS acted to make the pain relieved by mechanism of pain shutter control and increasing in endorphin and enkephalin excretion in CNS. (10)

In 1990, Aleccander (et al) had some research to distinguish the TENS effect on labor pain in Great Britain. This studynshowed that there were no strong evidence to prove the TENS effect on pain reduction during the labor. (14) The results of Aleccander`s (et al) studies is not in coordination with the present research because he has put the TENS on waist nerves not on acupunctural points.

Ramnero`s (et al) study in 2002 showed that there first stage on acupunctural points in two groups of TENS and TENS placebo and the delivery rate by vaccum was significantly more in TENS group. The present research results are not in coordination with those of Ramnero`s(et al) because in their study, the babies have had more average weight and the mothers have had less average height in TENS group. (6) Shorter women have smaller pelvises and passing a large fetus through a small pelvis can cause longer labor time and more pain suffering. (10)

In this research results, we have found out that using TENS on acupuncture points does not have

any effect on infants follow up and it also does not affect the infant`s 1 min and 5 min Apgar Score .The various studies in this field confirm this finding and there has been no report about infant`s complications related to this method usage. (7, 5, 15)

This double blind clinical trial has shown that the length of labor first stage and the need to labor augmentation by Oxytocin in acupuncture points of the TENS group is significantly less than TENS placebo group.

Because acupuncture needs to use various needles and a expert staff, TENS supply in acupuncture points can be easily trainable and usable as well as combining the effect of TENS and acupuncture.

This study has been done in nulliparous women so it is suggested to study the multiparous women, too. This research also studies the first stage of labor and reviewing the second and third stages of the labor is also suggested.

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Archeology of medical records: organization of knowledge in the context of health

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Abstract

Here we present the results of an investigation about the epistemology of patient records, regarding to the organization of recorded knowledge in such documents, supported by linguistic elements. We aimed to answer the following question: what aspects of linguistic can contribute to the indexal representation of medical records in order to recover quality information? For information tracking, were identified more than 1000 phrases and a concept map was built in the CmapTools software, according to the elements of textual linguistics: cohesion and coherence. In the first case, we mapped the phrases pertaining to endophoric references (anaphora, substitution, elision, conjunction, lexical cohesion). In relation to coherence it was identified the linguistic, pragmatic, and extralinguistic domain. We conclude that the textual linguistics can offer great contribution to information treatment of patient records and gives "clues" for information retrieval with more quality in the Medical Records and Statistics Services.

Key words: Medical records; textual linguistics; conceptual maps; indexing representation.

Introduction

Registering information in health services is necessary everywhere. This reality makes possible to track pathologies across history, to understand the course of these diseases and to discover possible changes in their clinical presentation[1]. Due to medical records, is also possible to evaluate the effectiveness of health actions and therapeutics.

We can infer that the epistemology of patients' records and the knowledge organization related to health is not different from other areas. It has its mark on Classical Antiquity, through iconographic notes related to diseases, performed on clay tablets, wood, rocks or papyrus by pre-historical doctors from Sumeria, China, Greece or Egypt[2]. In literature, we discovered that those notes were hieroglified for further consultation. Specialists credit to Imhotep, Egyptian doctor and architect, the first identified patient registers. Hippocrates, in the fifth century, affirmed the necessity for medical registers with exact information about pathologies and its causes[3].

According to Bentes Pinto[4], the medical record is a technical document, wrote by different professionals, which carries all the information about patient's health, including his identification and every action developed for treatment. These documents are composed according to every author's point-of-view and may contain different linguistic aspects. Patient record also makes possible the interdisciplinary dialogue between health professionals: doctors, nurses, physiotherapists, dentists and psychologists.

We aimed to answer the following question: what aspects of linguistic can contribute to the indexal representation of patient´s records in order to recover quality information? We produced a map with phrases for tracking the information contained in the records.

Therefore, having as substrata all the aspects contemplated in this background, this article was structured highlighting the following concepts: epistemology of knowledge register in the context of health, medical records, brief commentaries about textual linguistics, indexal representation, methodology and conclusion.

Epistemology of knowledge record in health services

In the epistemology of health-related knowledge, the first registers of disease and, consequently, the patient record, were dated from Classical Antiquity, disclosed by ancient paintings in caves and rocks about pathologies of that time. For example, related to the pre-Colombian times (300 BC), pieces of clay were found in Peru with registers about the course of some illnesses. Yet in Peru, other re-

searchers have also find medical registers describing the practice of trepanation, surgery to access the brain through small orifices at cranial bones[5]. Other organization systems were found at China, Greece and Egypt, registering information about diagnosis and treatment[6].

None of those organization systems, however, can be compared with the documental explosion which was made possible by electronic information and communication technologies. These advances supported document production, attaching words, images and sounds in the same multimedia document[6]. Starting from those registers of past times and improved with new technologies, medicine incorporated incredible advances in disease treatment and patient support.

Thus, we can observe that informational registers regarding to patient's health have advanced along time, being structured by alphabetical order, by human anatomy or like a sequence of consults and medical prescriptions[7]. Every one of these systems was an elementary form of treatment and knowledge organization in the field of health.

Patient record as the ultimate document for health services

According to Brazilian Federal Council of Medicine (CFM), the patient report is an unique document, constituted by a set of registered information, signs and images, generated from facts, happenings and situations about patient's health and the assistance directed for him[8]. This document has scientific, legal and secret character and should be used to make possible the communication between members of multi-professional team and the continuity of the assistance provided for patient. This instrument presents singular characteristics[9]. It is usually transcript and produced by different professionals and differs from other records because of some aspects:

a. Format: a semi-structured or not text, like acts of intervention, consult, anatomopathology, imaging examinations, etc.
b. Content: text in natural language which expresses facts, decisions, prescriptions, diagnosis and treatment, presenting enclosed structural information (demographic data, cholesterol analysis, blood pressure etc.);
c. Semantic: the understanding of a document depends on patient's therapeutic history registered in other documents of the same patient.

The communication between users and the recovering of the information present in this record will only be effective if the language contained in the patient record is in conformity with the receptors of these process[10]. If this is not true, the knowledge, although being publicly available, will not make sense neither will call their attention, even with the relevance of those data. Therefore, the patient record is a complex document and its analysis and indexal representation are difficult to perform. That is why it should be very important to index and to organize such register units, aiming to promote an easier and better access and information recovering.

Some words about textual linguistic

Textual linguistics refers to the text like a single communication act in a complex universe of human actions[10]. This text is comprehended as a basic unit of language manifestation and consists in the object of investigation. Human kind communicates through written texts and many linguistic phenomena can only be understood inside a text. For Koch, textual linguistics says that every single action is mandatorily accompanied by cognitive processes[11].

Textual linguistics sends a new perspective over textual study and concerns about context, writer/receiver interaction and communication process[12,13]. Text is now perceived not only as a finished product, but consists in a unit under construction. In the ambit of microstructure, textual linguistics approaches elements which constitute cohesion: reference, substitution, elision, conjunction and lexical cohesion. Cohesion promotes the logical-semantical structure of the text, making possible links between ideas, through phrases and paragraphs[14].

References can be exophoric (extra-textual) or endophoric (textual)[15]. The last one can also be divided in anaphora and cataphora. The anaphoric reference establishes a relationship that allows the interpretation of one item by its relationship with something that precedes it on the text[16]. Cataphoric reference establishes a cohesive relationship when its interpretation depends on something disposed further in the text. Substitution is characterized by

the use of some item instead of other with the same meaning, while elision is the omission of some lexical item which can be understood by the context. Lexical cohesion refers to employ equivalent terms or expressions with the same meaning[15, 17].

According to Koch, there are many understandings of linguistic and textual aspects[17]. Here we give emphasis in those deffending texts as:

a. A complex sentence (gramatical fundaments);
b. Theme-centered expansion of macrostructures (semantic fundaments);
c. Complex meanings (semiotics fundaments);
d. Complex act of discourse (pragmatic fundaments);
e. Specific mean for verbal communication (communicative fundaments);
f. Speaking of operations and cognitive processes (discursive fundaments).

Every one of these aspects must be considered at the moment of identification of syntagmata contained in the patients' records, making possible to produce the conceptual map with linguistic textual elements.

Methods

This is an applied and qualitative research, based on the Hussler's phenomenology[18]. There is a clear evidence of the phenomenon and it aims to comprehend the essence of the researched object. According to Godoy, a qualitative research has a descriptive character[19]. The whole process is the main focus, and not simply the result or the product. Data analysis does not require statistic methods or techniques and the interpretation of phenomena is more important. Although the importance of this subject can be perceived, linguistic and textual components behind electronic records stills a relatively unknown question for most of authors[20].

This research is composed by three steps. In the first, dedication is directed to the study of reference literature. The locus of empiric study is the Service of Medical and Statistic Archive of Walter Cantídio University Hospital (HUWC), owned by the medicine faculty of Universidade Federal do Ceará. Twenty patients' records were examined, aiming to identify linguistic and textual elements contained in these documents and to prepare a conceptual map of cohesion, coherence and their ramifications. The empiric study covers the period between 1973 and 2009. Records were chosen by its dimensions. Even in a 26-year coverage, most of records do not have sufficient documents to consolidate this study.

After owning these results, we produced a conceptual map in Portuguese, using the CmapTools software, aiming to expose representative syntagmas present in the content of those records. CmapTools is a copyright-free, open-code software, developed by the Institute for Human and Machine Cognition (IHMC), available at <ihmc.us>. This institute investigates the improvement and increase of human capacities by applying electronic information technologies in order to present graphically some theoretical concepts about specific subjects.

Results and discussion

Through the concrete and logical structure of medical records, it was possible to find something about 1,000 syntagmas containing elements of textual linguistic like cohesion and coherence. In the case of cohesion, we can highlight endophoric reference, anaphora, cataphora, substitution, conjunction and lexical cohesion. Related with coherence, were identified linguistic, pragmatic and extra-linguistic domains[21,22].

This way, we could identify discursive, narrative, argumentative and profound textual typologies contained in patients' records and also find information that can help for indexal representation of these components[23].

Due to the outcomes of the study with medical records, it was possible to identify syntagmas related with textual linguistic elements and produce a conceptual map representing information registered on those documents[24]. These elements can be important for the information recovering with more confidence and in a richer way. A new research aiming to confirm this finding will be performed further.

Conclusion

After seeing the results, we can understand that textual linguistics, allied to conceptual maps tool, brings important contributions for the informational treatment of patient records, giving tracks which can contribute for recovering the information with

higher quality levels. Identified syntagmata are reported to the discourses expressed by health professionals and by proper patients. These syntagmas are loaded with elements of conceptual linguistics.

We inferred that the dialogues between different knowledge fields are not just necessary, but fundamental, because the conceptual map production needed collaboration of professionals from areas such as linguistic, information sciences and informatics, aiming to compose a relevant representation for this research.

The conceptual map is one of the results from developed reflections. Its importance for information treatment on medical records is easily felt. Through these linguistic marks it is possible to propose different ways for representing and recovering information. Thus, health professionals will get "clues" or communication links to do their activities in a more confident and reliable way.

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Adolescents as a consumer: the food safety knowledge and practices

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Abstract

The purpose of this study was to evaluate knowledge, attitudes, and practices about food safety among adolescents. The questionnaire was designed to obtain information about adolescents knowledge, practices and attitudes about food poisoning, personal hygiene, cross-contamination and, temperature control. This questionnaire was administered 2074 randomly selected adolescents from Turkey. Most of adolescents answered items about temperature control, cooling and thawing practices wrongly. Most adolescents considered as informed about food safety (76.0%). About, 8.0% of adolescents have experienced foodborne illnesses in the last year. The food safety knowledge of adolescents were positively correlated with food safety attitudes, education level of participants, education level of mother, education level of father and age ($p<0.01$). Food safety knowledge and attitudes scores of adolescents was 37.8±16.4 (100 possible points) and 62.2±22.7 (100 possible points), respectively. Results also indicated that the mean food safety knowledge and attitude scores were poor among adolescents. As a conclusion, the findings of this study demonstrated that adolescents have lack of food safety knowledge. Therefore, food safety training should be provided for all adolescents in schools. A need for relevant and motivating food safety education exists in this group. Although computer programs, internet, television and other mass media have wider reach, government publications of food safety at home are more trusted, hence, can be used more effectively in educating consumers.

Key words: Food safety knowledge, adolescents, hygiene

1. Introduction

Each year, millions of people worldwide suffer from foodborne diseases (1), and illness resulting from the consumption of contaminated food has become one of the most widespread public health problems in contemporary society (2). In 1991 alone, some 23,000 cases of salmonellosis were estimated to have resulted in an overall cost of £40–£50 million in England and Wales (3). Health Canada estimates 2.2 million cases of food borne illnesses each year in Canada, resulting in a social cost of $1.3 billion annually (4). In United States, each year, food borne diseases affect 6.5 to 33 million people, with medical costs and productivity losses that have been estimated at 9.3 to US $12.9 billion (5). In 1998, although many factors like Bacillus cereus and Clostridium perfringens were underreported, 12,330 food poisoning incidences due to Brucella ssp., 120 cases due to Clostridium botulinum, 30,269 cases due to Salmonella Typhi and 1,457 cases due to Shigella ssp. were reported in Turkey (6). While most foodborne diseases are not reported and well documented in Turkey, based on the Turkish Statistical Institute report, 26,772 people were hospitalized from foodborne diseases between 2000 and 2002, resulting in 509 deaths (7). Since the reporting of foodborne illnesses to a specified agency is not obligatory in Turkey, data on foodborne infections and intoxications are inaccurate (8).

Choices in foods consumed at home and methods of food preparation are changing because of several factors: an increased demand for meals that are convenient to prepare and food that requires minimal processing, an increasing number of women in the workplace and a limited commitment to food preparation (9). All those involved in the handling and preparation of food have a significant role in the effort to reduce the prevalence of foodborne diseases (10). International studies have identified that consumers often implement unsafe food-handling behaviours during domestic food preparation (10). An observation study, conducted by Daniels

(11) concluded that 99% of the participants observed within the study made at least one major hygiene error while preparing each meal and that such errors are frequently compounded by cross contamination. Food-handling behaviors among consumers are an important variable with respect to decreasing the threat of foodborne illness, particularly among those at high risk. Most cases of foodborne illness are preventable if food protection principles are followed throughout the food chain, from production to consumption. The need for enhanced food safety education has been known in developed countries with the launch of national initiatives to find ways to effectively educate consumers, especially the young, who prepares food. The changing demographics and lifestyle, as well as emergence of resistant and exceptionally hazardous strains of food borne micro-organisms, create a situation that could lead to major outbreaks of life threatening food borne illness (12).

Data from other surveys, indicate that food mishandling is more acute in some consumer groups than in others. Specifically, young adults, men, and individuals with education beyond high school are more likely to engage in risky food handling than others. Byrd-Bredbenner et al (13) reported that young adults, particularly males, engage in unsafe food-handling practices, putting them at increased risk for food-borne disease, and participants were observed performing only 50 percent of the recommended behaviours. Also, Turconi et al. (14) found that knowledge about food safety is very poor among adolescent Italian population. According to their study, the most important topics which students incorrectly answered are related to food toxinfection and to food preserving. Woodburn and Raab (15), showed that respondents were not good at identifying either the food borne illness or the groups of people particularly at risk for food poisoning. They also found that 40% of the 100 Oregon food preparers either believed that contaminated foods could not be made safe to eat or they did not know how to do so. After observing 108 consumers during all stages of the purchase, preparation, cooking and storage of the one of four recipes, Worsfold and Griffith (16) saw multiple examples of poor food handling practices leading to greatest potential for crosscontamination and subsequent food poisoning. A total of 58% of the consumers stored chilled ingredients above 5^0C, 66% did not wash hands before work, 41% did not wash vegetables, and 60% used a single board for all cutting tasks. On the other hand, a study found that food safety was rated as significantly more important, when food shopping, by main meal planners who had one or more household members belonging to higher risk groups (15).

Earlier studies in adults have indicated that food safety knowledge tends to increase with age and practice: females have higher scores than males, and respondents under the age of 35 have shown the greatest need for additional food safety education (17, 18). Furthermore, respondents from urban areas tend to have lower scores than those from rural areas (19) and the "occasional cooks" (often men and young adults) or well-educated people and those with a high income tend to report more unsafe food-handling behaviors (20, 21) However, only a handful of studies have been conducted to explore the food safety knowledge, perceptions, and practices among younger populations and children (22, 23). Despite these scientific facts, little is known about the food safety practices of adolescents who prepare meals at home. Most studies have examined the food safety practices and knowledge of the population as a whole with minimal analysis of subpopulations at risk (e.g., adolescents). In addition, studies have examined only selected practices to cook, cool, and thaw at home. To prepare food, however, adolescents need to use an array of food safety practices (9, 24, 25). It should be also noted that adolescents food safety practices and knowledge are important in preparation of their own food, as well as that of others for whom they may care and prepare food; this could include younger siblings, other children, grandparents, or other adults. Adolescents learn by observation of others, and this could lead to the transferal of safe or unsafe food-handling practices and knowledge. The limited research related to food safety knowledge, practices, and attitudes of adolescents in literature indicates food-handling problems need to be addressed. The aim of this study was therefore to investigate the actual level of food safety knowledge and relevant practices in food handling among adolescents.

2. Material and Methods

2.1. Participants

The participants were 1183 females and 891 males, a total of 2074 randomly selected adolescents aged between 16 and 18 years (mean age 16.51, standard deviation 0.65 years). Adolescents were selected from twenty public and eleven private high schools in Ankara, capital city of Turkey. Measurements and data collection were conducted during a 10 month period between April and November 2009. The study data was collected by 22 interviewers, each of whom distributed 100 questionnaires. Interviewers were trained, postgraduates students, who visited selected university in Ankara, Turkey. The study took place during the school schedule with participants completing the questionnaires in their classrooms or school laboratories in groups of 20 to 30 students under the supervision of the researchers. The study was completely anonymous and voluntary and no incentive was offered for participation. Each group took approximately an hour to complete the study. The objective of the study was briefly explained to adolescents by interviewers. Items in the questionnaire were explained when necessary and administered at one sitting as far as possible.

2.2. Instrumentation

The questionnaire was tested in a pilot study by 100 participants during January through March 2009, resulting in minor modifications with the question wording. The revised questionnaire was divided into three sections: (1) a demographic section, (2) food safety knowledge, and (3) food safety attitudes and practices. Each questionnaire took aproximately 20 minutes to administer. Ten questions were related with demographic characteristics of adolescents (etc., education level, age, gender, history of food poisoning). Food safety knowledge questions were related to the key issues identified by authorities to be important in food safety (5,16,26) check foods, cook to proper temperatures, chill promptly, separate raw and cooked foods, and wash your hands. The questionnaire included 21 questions each with five possible answers. To reduce the response bias, the multiple choice answers included ‘‘have no idea’’. The score range was between 0 and 21. The scores were converted to 100 points. The score below 50% of food safety knowledge questionnaire is accepted as poor knowledge.

The food safety attitudes and practices questionnaire (FSAPQ) was prepared based on the previous research conducted by Bruhn and Schutz (18). The questionnaire included 25 questions related to food safety attitudes and practices toward food safety. Adolescents were asked to indicate their level of agreement to the statements using a four-point rating scale (4 =strongly agree, 3 = agree, 2=disagree, and 1=strongly disagree). The score range was between 0 and 100. The factorial validity of FSAPQ was tested with the Principal Component factor analysis with varimax rotation. Kaiser-Meyer-Olkin (KMO) of 0.81 indicated a high sampling adequacy for the factor analysis. Bartlett’s test of sphericity, which tests whether the correlation matrix is an identity matrix, yields a high chi-squeare value of 12663.62 and significance level of 0.000. This indicates that the factor model is appropriate. Principal Component Analysis with varimax rotation determined 2 factors which are Food Safety Attitudes and Food Safety Practices. The analysis of data revealed 2 factors that in total, explain 62.8% of the variance among the scale items. Factor loadings ranged between 0.45 and 0.81. Construct validity was assessed by principal component factor analysis with varimax rotation and reliability was tested by Cronbach’s alpha coefficient (cronbach alpha=0.89). The test-retest reliability ranged from .90 (Food Safety Attitudes) to .96 (Food Safety Practices).

2.3. Statistical analysis

All statistical analyses were conducted using SPSS for Windows (version 11.0, 2001, Chicago, IL). Mean responses and percentages of responses in each category were calculated and presented in a tabular form. Mean and standard deviation values were used to evaluate the scores. In addition, in terms of the correlation between variables (etc., age, education) and the scores of food safety knowledge and attitudes scores. Internal consistency reliability was assessed with Cronbach’ alpha coefficient. For each item, the correlation with its own domain and with other domains was calculated. A value >0.70 is conventionally considered acceptable. Test–retest reliability was determined (n=100) with the

intraclass correlation coefficient (ICC) between the questionnaire completed by the same subject at the initial visit and 1–2 weeks later, and values ≥0.60 were considered statistically significant. Construct validity was investigated by the association of questionnaire scores. We expected to detect strong correlations between scales of similar content and moderate correlation between interdependent measures. Pearson's correlation coefficient was used to examine the correlation between these instruments and other variables. For statistical analysis, p values <0.05 were considered statistically significant.

3. Results and discussion

Most adolescents were not informed about food safety. About, 8.0% of adolescents have experienced foodborne illnesses in the last year. However, minority of respondents were aware of Brucella (28.9%), Staphylococcus aureus (5.4%), Salmonella (4.5%), Shigella (7.8%) and Clostridium perfringens (1.5%). Less than 1% of respondents were aware of other pathogens (etc., Yersinia enterocolitica, Clostridium botulinum). Food safety knowledge and attitudes scores of adolescents was 37.8±16.4 (100 possible points) and 62.2± 22.7 (100 possible points), respectively.

Most frequently incorrectly answered food safety knowledge questions were related to temperature control, cooling and thawing practices. Approximately, twenty-two percent of adolescents had correctly answered according to FDA Food Code, that the temperature of the cooked meat products should be kept at or above 63 ^{0}C (Table 1). Also, majority of adolescents (43.7%) believed that one could tell if food was contaminated with food poisoning bacteria, resulting in being unsafe to eat, by taste checks. Many adolescents were not aware of the basic temperature control requirements for the control of microbial hazards. About, 83% thought that freezing killed all bacteria. Twenty-two percent correctly answered that the temperature of the food in a refrigerator should be at or below 4 ^{0}C. The majority of adolescents (61.7%) knew the reason for seperating cooked and raw foods, and 50.4% of adolescents knew that sandwich with chicken could be a vehicle for food poisoning. About, 46% of adolescents knew that UHT milk was sterile, however, 31% thought that pasteurised milk was sterile. Almost the half of adolescents (48.4%)

Table 1. Knowledge of food safety of adolescents-selected ıtems (N = 2074)

No.	Query	Response	%
1	*At which temperature must the cooked meat products be kept at?*	25^{0}C	5.7
		47^{0}C	8.0
		63^{0}C	***22.5***
		99^{0}C	48.5
		No idea	15.3
2	*Which one of the following is steril?*	***UHT milk***	***46.1***
		Yoghurt	12.8
		Pasteurized milk	31.3
		Butter	3.7
		No idea	6.1
3	*Which of the following temperatures do bacteria readily multiply at?*	-10^{0}C	7.2
		25^{0}C	***39.2***
		75^{0}C	27.8
		120^{0}C	14.2
		No idea	11.6
4	*At body heat 37 ^{0}C what will food poisoning bacteria do?*	Die	5.7
		Do not grow	28.1
		Grow quickly	***32.3***
		Grow slowly	21.4
		No idea	12.5
5	*The temperature inside a refrigerator should be at or below which temperature?*	10^{0}C	11.7
		4^{0}C	***22.0***
		0^{0}C	28.5
		-12^{0}C	34.8
		No idea	3.0
6	*If food is contaminated with food poisoning bacteria you can normally tell by?*	Tasting it	43.7
		Smelling it	21.4
		Looking it	6.5
		None of these	***18.5***
		Not sure	9.9
7	*Which is a common symptom of food poisoning?*	Headache	21.9
		Diarrhoea	***48.4***
		Rash	13.6
		Constipation	11.9
		No idea	4.2
8	*Which one of these foods is high risk foods?*	Cracker	15.8
		Sandwich with chicken	***50.4***
		Pizza with cheese	14.6
		Bread	6.8
		No idea	12.4
9	*At freezing temperature -18 ^{0}C what will food poisoning bacteria do?*	All of die	68.7
		Do not grow	8.1
		Some of die	***10.3***
		Grow slowly	5.4
		No idea	7.5
10	*Why should raw and cooked foods be seperated?*	Food will go off quicker	16.7
		The flavour will be affected	13.8
		The texture will be affected	5.6
		To stop bacteria transfer	***61.7***
		No idea	2.2
11	*Which bacteria can be cause of foodborne disease?*	Salmonella	4.5
		Brucella	28.9
		Staphylococcus aureus	5.4
		Shigella	7.8
		Clostridium perfringens	1.5
		All of these	12.8
		Other	1.0
Bold indicated that correct answer			

Table 2. Pearson's correlations of food safety knowledge scores, food safety attitudes and practices scores, age and education level of participants, education level of father and mother

	Food Safety Knowledge Scores	Education Level Of Mother	Education Level Of Father	Age
Food Safety Attitudes and Practices Scores	0.271**	0.107**	0.021	0.106**
Food Safety Knowledge Scores		0.192**	0.142**	0.072**
Education Level of Mother			0.587**	0.019
Education Level of Father				-0.142**

** *Correlation is significant at the 0.01 level*

* *Correlation is significant at the 0.05 level*

Table 3. Consumer attitudes of safe food handling (n = 2074)

Statement	Strongly Agree	Agree	Disagree	Strongly Disagree
1. For greater safety, meat products should be cooked until they are no longer pink	45.5	42.7	7.8	4.0
2. Cooked food should be cooled before refrigeration or freezing	41.8	40.3	11.1	6.8
3. Leftover foods (potential hazardous foods) can be safely kept at room temperature several hours	41.6	44.0	8.4	6.0
4. Freezing of meat or poultry will destroy bacteria that causes food-borne illness	80.6	13.7	1.7	3.9
5. I don't use opened or damaged food packages	45.8	38.0	10.2	6.0
6. Use raw eggs in salads, desserts, and drinks, like egg nog.	6.5	9.4	33.1	51.1
7. When purchasing frozen foods, I check their expiration date	5.9	4.6	26.8	62.7
8. Tap water is considered safe by the major health and safety organizations	54.5	30.3	6.6	8.6
9. Taste leftovers to check if they are still safe	17.2	31.2	32.0	19.6
10. Raw milk is more healthy and nutritious than pasteurized milk	3.8	1.9	13.7	80.6
11. Freezing food can be thawed at room temperature	44.0	43.6	7.4	5.0
12.Washing hands with soap and water before eating food is necessary to prevent food poisoning	33.2	12.4	49.6	4.8

knew that diarrhoea was a symptom associated with food poisoning.

Table 2 outlines the correlations between food safety knowledge scores, food safety attitudes and practices scores, age of participants, education level of father and mother. The food safety knowledge of adolescents were positively correlated with food safety attitudes, education level of mother, education level of father and age of participants ($p<0.01$). Also, food safety attitudes and practices scores of adolescents were positively correlated with education level of participants, education level of mother and age ($p<0.01$).

The responses of the adolescents to the attitude questions about food safety are presented Table 3. On the other side, more than 50% of the adolescents had negative attitude and disagreed with statement "washing hands with soap and water before eating food is necessary to prevent food poisoning". The rate of negative attitude was also more than 85% of the adolescents on the statement "freezing food can be thawed at room temperature". Over 80% indicated that freezing does kill all bacteria that cause foodborne illnesses and 54.5% believed that tap water are considered safe by major health and safety organizations. Most adolescents, (84.2%) disagreed or strongly disagreed to use raw eggs in salads, desserts, or drinks. Minority of adolescents disagreed to taste to determine if leftovers were safe; however about 48% strongly agreed or agreed to taste for determining safety.

The responses of the adolescents to the food safety practice questions are presented Table 4. More than 75 % students reported that they didn't wash their hands with soap and water before preparing and eating foods and after contacting with animals.

Table 4. Consumer practices of safe food handling (n=2074)

Statements	Strongly Agree	Agree	Disagree	Strongly Disagree
1.Do you always wash your hands with soap and water before eating your food?	3.7	1.1	17.7	77.5
2.Do you always wash your hands with water and soap before preparing food?	2.8	1.0	15.3	80.9
3. Do you always wash your hands after touching to animals?	2.5	1.3	16.2	80.0
4. Do you eat cooked food left at room temperature for 6 h if it is covered?	52.0	15.8	17.6	14.6
5. Do you share your plates and cups with other people?	60.2	10.5	7.6	21.7
6. Do you drink raw cow or goat milk?	5.3	9.6	5.1	80.0
7. Do you eat raw white cheese prepared from un-pasteurized milk?	65.4	6.8	5.2	22.6
8. Do you eat raw eggs?	16.9	10.8	25.6	46.7
9. Do you eat raw meat?	18.0	9.8	19.6	52.6
10. Do you eat half-cooked meat?	74.8	15.6	6.8	2.8
11. Do you just wipe fresh vegetables and fruits before you eat them?	34.0	55.9	5.1	5.0
12. Do you pick up vegetables or fruits from the plants and eat them without washing on field trips?	50.0	33.4	11.9	4.6
13. Do you always wash fresh vegetables and fruits in tap water before eating?	34.0	55.9	5.1	5.0

Also, approximately 25 % eat raw egg and meat. The precentages of adolescents drinking raw cow or goat milk (strongly agree= 5.3%; agree=9.6%). Almost half of the adolescents stated that they eat cooked food left at room temparature for 6 h if it is covered. Also, more than half of the adolescents share their plates and cups with other people.

The global incidence of foodborne illnesses is difficult to estimate but it has been reported that in 2000 alone 2.1 million people died from diarrhoeal diseases. A great proportion of these cases can be attributed to the contamination of food and drinking water. The surveillance of foodborne disease outbreaks have been fairly well-established in developed countries but in spite of that only a small percentage of actual cases i.e. less than 10% in industrialized countries are recorded in official statistics. In the case of developing countries it could be even less than 1% (27). Although the public is increasingly concerned about food-related risks, the rise in food poisoning cases suggests that people still make decisions of food consumption, food storage and food preparation that are less ideal from a health and safety perspective. The percentage of cases arising from food preparation practices in the home may be especially under-represented in outbreak statistics, due to many factors. Studies have estimated that between 50 and 87% of reported food-borne disease outbreaks have been associated with the home. Common mistakes identified comprise serving contaminated raw food, raw food of animal origin, and the practice of poor hygiene (28).

In general, the results reveal low knowledge of Turkish adolescents on some important factors related to food safety. For example, over 75% of the adolescents reported not washing their hands (77.5%) before having a meal. Also over 85% of the adolescents lack the knowledge that some bacteria are cause of foodborne diseases. The overall percentage mean score 37.8% for knowledge is considered poor. Girls have better hygiene behavior than boys, perhaps because they are more involved in meal preperation and cooking food at their home. A large scale survey study on young adults with education beyond high school in USA, showed that 60% of the participants have knowledge on food-borne diseases (13). A similar result of knowledge score was reported in a study on college students of University of Missouri, USA (29). Our results are similar to those of Turconi et al. (14) who found, in a sample of 889 Italian adolescents attending high schools, that adolescents have very poor knowledge about food safety.

Furthermore, certain demographic groups, such as men and adults aged between 9 to 29 years, have

been reported to have more improper food-handling behaviors (30). Spangler (44) documented more potential of high nutrition risk among older African-Americans than older white participants of congregate and home-delivered meals, because of their lesser education and income resources. Unsafe food-handling behaviors have also been reported by occasional food preparers, a group that might include many home-delivered meal providers (31). Our findings indicated that minority of adolescents have experienced foodborne illnesses in the last year. The prevalence of self-reported food poisoning history was found to be 8.4% among adolescents in current study. Also, few adolescents were aware of food pathogens (etc., Salmonella, Brucella, Yersinia enterocolitica, Clostridium botulinum). However, the true occurrence of foodborne diseases in this population is likely to be underreported because symptoms of foodborne diseases are often thought to be caused by flu (32). Furthermore, the importance of young adult food-handling behaviors becomes clear as their current and/or future roles as caregivers for household members at increased risk, such as young children and aging parents, is realized.

Raab and Woodburn (33) pointed out that there is a disparity between food safety knowledge and selfreported practices. In a study of the knowledge and behaviour of hamburger meat in 1439 consumers in Texas, Mcintosh et al. (34) concluded that while better-educated people tend to choose healthy and safety as their reason for cooking preference, these respondents are more likely to prefer their hamburgers to be less well cooked. Thus, the reasons for cooking preferences may be unaffected by either knowledge or mass media exposure. Furthermore, many individuals may not associate what they know about the risks of improperly cooked hamburger with their own practices. Attitudes, an important factor together with knowledge and enforcement, ensure a downward trend of foodborne illnesses. The necessary link of positive behaviour, attitudes and continued education of food handlers towards the sustainability of safe food handling practices has been highlighted (35). A generally negative attitude toward correct handling of food, safe storage practices, and cross-contamination control was to be found among adolescents in our study.

Foods vary in composition, so no single cooking temperature is going to give the culinary quality desired and the safety needed for all food; there are various combinations of time and temperatures needed to inactivate pathogenic vegetative bacteria (36). Since temperature treatment is frequently the critical control point a production process, the issue of poor temperature understanding could be a major hindrance of effective food safety (26). In this study, there was lack of knowledge among the adolescents about the critical temperatures of hot or cold ready-to-eat foods, acceptable refrigerator temperature ranges, and cross-contamination.

Consistent with previous research on cooling practices in the general population, this study identifies the use of two inappropriate (store in larger containers and allow food to remain at room temperature for an unacceptable period of time) and two appropriate cooling practices (break down and store in smaller or shallower containers and refrigerate within an appropriate amount of time) by the adolescents (27,38). In our study, 80% of adolescents incorrectly thought that cooked food should be cooled to room temperature before refrigeration or freezing. These findings are comparable to Williamson (38) in which a nationwide sample of consumers let roasted chicken sit on the counter until it cooled completely before refrigerating; only 32% of consumers used small shallow containers to refrigerate leftovers; and 14% and 18% indicated uncertainty or no concern avout the safety of cooked poultry or meat left unrefrigerated for over 4 hours. Improper cooling and hot holding were factors in about 25% of the outbreaks. The items specifically related to poor personal hygiene and cross-contamination accounted for about 10% and 3% of reported outbreaks, respectively. The results from our study indicated that the majority of respondents thawed meat improperly who thawed foods at room temperature. This critical violation is comparable to the proportion of respondents of other studies who thawed foods at room temperature: 41.6% in Badrie et al. (37), 56% in Kennedy et al. (39), and 45.2% in Surujlal and Badrie (40).

The food safety knowledge of adolescents were positively correlated with food safety attitudes, education level of participants, education level of mother, education level of father and age. In another study, significant differences were found in food safety perceptions for age, gender, household income, education and employment in the food in-

dustry. In addition, a significant relationship has been determined between the perception of safe food by consumers and their behavior (41).

In an assessment of the food safety behaviour of young adults, most of participants did not washing the cutting board with soap and water after slicing raw chicken (18). Whereas, cutting boards used to prepare raw meat can be used to prepare salad or other uncooked food, transferring disease-causing bacteria and other agents from the meat to the salad. Less than half of the respondents (38.0%) strongly agreed there is a strong possibility of poisoning when using the same cutting board for cutting chop vegetables and raw meat, and 17.9% strongly disagreed that this does not affect potential poisoning in our study. This compares to previous research in which 54.0% said they would wash a cutting board with soap and water between using is to cut raw meat and chop vegetables (38). Similarly, among Canadians, 68.0% recognized that chopping raw vegetables and uncooked chicken with the same knife and cutting board without cleaning was an unsafe practice (42). Hillers et al. (43) suggested that knives, cutting boards and food preparation surfaces should be washed with hot water and soap after contact with raw poultry, meat and seafood. They summarized behaviour related to cross-contamination as the second most important behaviour leading to outbreaks of Campylobacter jejuni, Salmonella serotypes other than Enteritidis, and Yershinia enterocolitica.

As a conclusion the findings of this study demonstrated that adolescents have lack of food safety knowledge. Food safety education efforts designed to solve this problem could be targeted to young adults; however, little is known about this population's food safety knowledge. Therefore, food safety training should be provided for all adolescents at schools. A need for relevant and motivating food safety education exists in this group. Although computer programs, internet, television and other mass media, and using interactive educational media like videos, computer games. Efforts to improve knowledge and, ultimately food safety behaviors, are needed to safeguard the health of this population and enable them to fulfill the role of protecting the health of their future families. Consumers would benefit from home food safety education, including information about temperature control, correct home food preparation practices and cross-contamination.

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Designing a hospital performance assessment model based on balanced scorecard

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Abstract

Introduction: Balanced scorecard is one of the most successful and widely used models of performance assessment in healthcare organizations, especially in hospitals. The model is a framework for designing a set of performance measures for organization strategies. The research was conducted with the aim that it yields a balanced scorecard model for Iranian social security hospitals for performance assessment.

Methods: In this adaptive and descriptive research, ten balanced scorecard models which have successful experiences were studied. A model for Iranian social security hospitals was designed and validated it by using expert's survey in DELFI method. Independent t-test was used to identify significance of expert responses. Data were analyzed using SPSS software.

Results: In the first section of the proposed model, a mission statement was defined as a template for Iranian social security organization hospitals. In the second section, 5 perspectives were defined including clinical perspective, patient perspective, internal processes perspective, financial perspective and employee growth perspective. According to research findings, the mean score was 11.5 for clinical perspective, 11.1 for patient perspective, 11.3 for internal processes perspective, 10.2 for financial perspective and 11.3 for employee growth perspective. Twenty seven measures were designed for these perspectives two of which were excluded. P value ($p<0.05$) was calculated with t-test for 95% confidence interval.

Conclusion: The model can be implemented one or all hospitals of social security and also be used for comparing hospitals performance. Because of the dynamic nature of balanced scorecard, the model is a flexible framework that could be adjusted by local situations based on differences in targets.

Key words: Organizational Management, Process Assessment, Social Security, Hospitals, Iran.

Introduction

Performance measurement is receiving increasing attention around the world. In many organizations today, regardless of their size or type, performance assessment and how it is monitored are major concerns. Perhaps The Balanced scorecard (BSC) is the best known performance measurement model (1). The model was introduced based on the results of a study by Kaplan and Norton as a measurement tool (2). A group of indicators are arranged in several perspectives in this tool, which permitted the recognition of the causes of the performance. Kaplan and Norton wanted to overcome the boundaries of using only financial indicators and provide information for managers on the drivers of future performance (3). They described that the performance measurement system should provide managers with sufficient information to address the following questions:

- How do we look to our shareholders (financial perspective)?
- What must we excel at (internal business perspective)?
- How do our customers see us (customer perspective)?
- How can we continue to improve and create value (innovation and learning perspective)? (4)

The BSC was a response to the fact that there is not a single performance indicator that could show the performance of a complex organization such as health care organizations specifically hospitals (5). Later, this measurement model was converted to a system for managing and implementing strategies (4). For this purpose, strategy was placed in

the heart of the model (4). This change converted it as a strategic management tool (3).

Advantages of The BSC were explained as:

- Clarify and gain consensus about strategy,
- Communicate strategy through the organization,
- Align departmental and personal goal to the strategy,
- Link strategic objectives to long-term target and annual budgets,
- Identify and align strategic initiatives,
- Perform periodic and systematic strategic reviews, and
- Obtain feedback to learn about and improve strategy (4)

In the service industry, we have some resources with intangible nature. In the context, measurement of performance becomes more complex and financial indicators could not provide necessary information to evaluate the organizations. In addition, the purpose of organizations in the service industry as Non-for-profit organizations, in particular hospitals, is achieving their particular mission. Consequently, a lot of non-profit organizations lack even the simplest financial indicators, such as net income and they have many non-financial indicators which measure the quantity and quality of services (3). Another challenge is Methodological issues related to selection of their indicators. Most of them may not have sufficient insight for relation of indicators with their mission. Use of indicators that have not effectiveness for target population is the worst of all (5).

Because of the usefulness of The BSC as a generic model and its strengths such as delivering information of strategy, focus on organization's current and future, balancing internal and external perspectives, acting as an integrating tool, and serving as a dynamic process used to performance assessment, it is deployed by many health care organizations especially hospitals (6,7). Balanced view of hospital performance by using four (or more) perspectives helps to integrated mission, strategy, resource allocation, operational processes, and outcomes as a system (7).

Many hospitals and health systems are developing The BSC for performance assessment (6, 7, 8). Increasing competition in the health care industry, information technology systems, the public demand for more information, reduction in information overload for managers and focus on critical factors are impellents for hospitals using The BSC (7, 8).

Iranian Social Security Organization (ISSO) is a social insurer organization. It is a non-governmental Institution and provides 18 services, in the form of short-term and long-term obligations in insurance and Medical section. ISSO was established in 1975 according to the law of 1975. Initial efforts were started from 1932. Finally, the law was revised in 1989 and it required the ISSO to provide health care services itself directly. Coverage of ISSO was equal to over 27 million people of Iranian social workers and their families. The ISSO provides medical services as second provider in Iranian health sector (9).

Medical services are divided into two sections:

- First, Direct system: Medical care and medicines are provided directly to covered patients through medical facilities belonging to the ISSO. Medical services are provided through 73 hospitals and 270 medical clinics owned by the ISSO.
- Second, indirect system: Medical services are purchased through public and private hospitals and clinics, as well as through university hospitals and contracted-out physicians.

Sixty hospitals out of 73 are certified by ISO 9001 certification. These hospitals have a process-based approach.

In the case of hospitals in general, there are numerous contributions regarding performance assessment as measurement tools which facilitate the identification of indicators (10).

However, these contributions are limited to the identification of non-strategically related indicators. The classic indicators utilized by hospitals can be grouped as:

- Annual statistical report: it includes clinical and Para-clinical indicators e.g. outpatient visits, inpatient, rates for mortality (11).
- Annual economical report: it include Service utilization indicators: e.g. rates for medical consultations, surgical interventions, exploration and diagnostics, average stay per patient, number of available beds, average

bed occupation, number of annual admissions and discharges, occupancy rates per service, and average rotation of beds (12).

This research aimed to design a balanced scorecard model for Iranian social security hospitals for performance assessment.

Methods

The study was conducted as an adaptive and descriptive research. First, a mission for the ISSO's hospitals was defined according to social security laws, based on policy statement in hospitals that is certified by ISO 9001 and other requirements. Second, ten balanced scorecard models which have successful experiences were studied.

The data collection was started with review literature and a series of semi-structured interviews were conducted between hospital managers to determine their perceptions about the selection and implementation of a new performance measurement system across the hospitals. In addition, the managers in medical deputy of ISSO were also interviewed. A model for Iranian social security hospitals was designed. It was prepared in a questionnaire format. The questionnaire had three sections: 1- short description of the model, 2- mission section, and 3- perspectives and related indicators with a brief definition for each. We sent it to 60 hospitals with ISO 9001 certification and 20 managers in medical deputy of ISSO. All of them had master in science or Ph.D., and over 5 years of experience in the field. The scales consisted of self-report items scaled in a Likert scale. The Mission section consisted of five question related to proposed mission. The scales consisted of self-report items scaled in a five-point Likert scale (1 = completely disagree to 5 = completely agree). The questionnaire was validated by using 15 expert's survey in DELFI method. The reliability coefficient for this questionnaire was relatively high (Cronbach's Alpha= 0.94).

In the final section, several questions related to the proposed Perspectives and indicators were designed. Each question was assessed based on four criteria including: relevance to mission, importance, measurable, and possibility of intervention. The scales consisted of self-report items scaled in a three-point Likert scale. The one-sample T-test was used for analysis. The hypothesis was failed to reject that the sample mean does not differ significantly from the hypothesized number (75% of total scale). If significance is less than 0.05, then the test is significance at 95% confidence. This was the standard criterion used. Data were analyzed using SPSS software package.

Results

Our findings are categorized in four sections. First, models used to the comparative study are introduced. Second, mission related findings are presented. Third, perspectives of the ISSO's BSC model are described. Finally, findings about indicators are presented.

First, in a comparative study, ten balanced scorecard models which have successful experiences were studied and the proposed ISSO's BSC model was designed. These models and their perspectives are presented in Table 1. These models are generic BSC model (2), Canadian Institute for Health Information model (13), Singapore Hospital's model (14), Barberton Citizens Hospital model (8), The Netherlands national health service (NHS) model (15), St. Luke's Hospital model (7), The NHS performance assessment framework (16, 17), European Regional Office of world health organization (WHO) (18, 19), and a proposed model for Iranian ministry of health (20).

Second, out of the 80 questionnaires sent out, 54 completed questionnaires were returned, representing a response rate of 67.5 percent. The average age of respondents' work experience was 12.4 years. Only 32% of repliers were female and 68% of them were male. The ISSO's hospitals mission statement is designed as a template. It was in the following form:

…hospital's name... hospital as a general/special non-governmental hospital in the

…province name… province under direction of ISSO's medical deputy provide health care services for all patients/clients with priority of social insureds and their families. We integrate our attempts for performing the mission with the following policies:

- Continuous improvement in health care quality and safety

Table 1. Ten BSC models and their Perspectives used in the comparative study

Model	Perspectives	Author(s)
Generic BSC model	1. Financial, 2. Consumer, 3.Internal business processes , 4.learning and growth.	Kaplan and Norton, 1992
Canadian model	1. System Integration and change, 2.Patient satisfaction, 3. Clinical Utilization and Outcomes, 4.Financial performance and condition.	Canadian Institute for Health Information, 2007
Barberton Citizens Hospital model	1. People, 2. Service, 3. Quality, 4. Finance, 5. Growth.	Josey & Kim, 2008
The Netherlands model	1. Consumer, 2.Financial, 3.Internal business processes, 4.Innovation.	Asberoek, et al. 2004
Singapore Hospital's model	1. Customer; 2. Supplier; 3. Process; 4. IT system; 5. Learning and Growth; and 6. Overall.	Kumar, Ozdamar, 2005
The NHS performance assessment framework	1. Health improvement, 2.Fair access, 3.Effective delivery of appropriate health care, 4.Efficiency, 5.Patient experience of the NHS, 6.Health outcomes of NHS health care.	Chang, 2007
European WHO model	1. Clinical effectiveness, 2.Safety, 3.Patient centeredness, 4.Production efficiency, 5.Staff orientation, 6.Responsive governance.	WHO European Office, 2003; VEILLARD, et al. 2005
Performance ratings for NHS Trusts	1. Clinical focus, 2. Patient focus, 3. Capacity and capability focus.	Snelling, 2003; Patel, chaussalet, Millard, 2008
St. Luke's Hospital	1. Financial, 2. Customer satisfaction, 3. Growth and development, 4. Clinical and administrative quality, 5. People.	Olden & Smith, 2008
Iranian ministry of health	1. Patients and Customers, 2. Financial, 3. Internal business processes, 4.Learning and Growth.	Begloo, 2008
Proposed ISSO hospital's model	1. Clinical results, 2.Ppatients, 3.Internal processes, 4.Financial, 5.Employee growth	

- Optimization of current resources and facilities utilization
- Team working for satisfying our patients/ clients
- Responsibility for environment and employee health and safety.

The findings showed that respondents agreed with the statement of mission (mean response 3.91 from 5). The score for Continuous improvement in health care quality and safety policy was 4.43. Optimization of current resources and facilities utilization gained 4.44 scores. Team working for satisfying our patients/clients policy received 4.39 scores. Responsible for environment and employee health and safety policy gained 4.07 scores. Mission statement and its policies was significant in 95% confidence interval ($p<0.05$).

Third, five perspectives are presented in the ISSO's BSC model. They are clinical perspective, patient perspective, internal processes perspective, finance perspective and employee growth perspective. These perspectives were common in ten comparative models (>60%). According to the research findings, clinical perspective gained the highest score (11.5 from 12). The mean score of patient perspective was 11.1 and internal processes perspective 11.3. Finance perspective gained the lowest score (10.2). The mean score of employee growth perspective was 11.3. Mission statement and its policies were significant in 95% confidence interval ($p<0.05$).

Finally, 27 indicators are defined in the ISSO's BSC model. Six indicators in clinical perspective, 3 in patient perspective, 7 indicators in internal processes perspective, 5 indicator in finance perspective and 6 indicators in employee growth perspective were defined. The perspectives and their indicators are presented in Table 2. Two of them, big surgery percent in internal processes perspective and percent of preventive maintenance (PM) cost of total budget in finance perspective, were not accepted ($p> 0.05$).

Table 2. Perspectives and their related indicators in The ISSO's BSC model

Perspective	Indicator	N	Mean	Std. Deviation	t	Sig. (1-tailed)
clinical perspective	Readmission rate	54	10.24	1.737	5.250	.000
	Percentage of caesarian sections	54	10.44	1.355	7.833	.000
	Hospital acquisition infection rate	54	10.65	1.771	6.837	.000
	Patient safety culture	54	9.8333	1.38387	4.425	.000
	Sentinel event rate	54	9.6667	1.76977	2.768	.008
	Mortality rate	54	10.0556	1.74201	4.453	.000
patient perspective	Patient satisfaction	54	10.6481	1.84450	6.566	.000
	Rate of Patient complaints	54	10.7593	1.19646	10.805	.000
	Mean waiting time in emergency department	54	9.7963	1.77381	3.299	.002
process perspective	Length of stay	54	10.5185	1.66813	6.689	.000
	Outpatient per doctor	54	9.9815	1.73195	4.164	.000
	Cancelled operations	54	10.3519	1.63865	6.062	.000
	Big surgery percent	54	9.2778	2.38246	.857	.395
	Inpatients per doctors	54	9.8519	1.35155	4.632	.000
	Employee productivity	54	10.0185	1.56000	4.798	.000
	Bed occupancy	54	11.1481	1.32334	11.929	.000
finance perspective	Income per inpatient	54	10.3889	1.70921	5.971	.000
	Income per outpatient	54	10.1667	1.93039	4.441	.000
	Cost coverage	54	10.8519	1.36544	9.966	.000
	Preventive maintenance (PM) cost of total budget	54	9.2963	1.99650	1.091	.280
	Current cost per bed	54	10.6296	1.75151	6.837	.000
employee growth perspective	Training expenditures per capita	54	11.0556	1.69813	8.895	.000
	Sickness absence rate	54	10.5370	1.17703	9.596	.000
	Employee satisfaction	54	11.2407	1.19646	13.762	.000
	Percutaneous injuries	54	10.3519	1.88497	5.270	.000
	Training expenditures	54	10.2963	1.90956	4.988	.000
	Information technology (IT) efficiency	54	10.2222	1.84970	4.856	.000

Discussion

An organization's mission is its purpose and scope of operations (21). According to the 1989 law, ISSO was required to provide health care services directly to cover of Iranian social workers and their families (9). The BSC model newly added the mission perspective to the model (22). Bart and Hupfer have identified as many as 25 items that may warrant inclusion in an organization's mission statement (23). It was maintained that mission statement differs from vision statement and values statement and it has aimed to separate these statements. Begloo A.G. said we could not define mission, vision and value statements for all hospitals (20). Bart and Hupfer had not separated these statements and mixed as a statement for Canadian hospitals (23). Mission in the service industry is located on the top of these models (22, 24). Some models such as Barberton Citizens Hospital model, The NHS performance assessment framework, European WHO model and St. Luke's Hospital defined their mission explicitly (8, 16,18,19, 7). The mission statement was defined and definition of vision statement referring to each hospital. Policy statement in the ISSO's hospitals was a great advantage for the research.

Four perspectives in the generic BSC model have been provided as a template and it could be changed by designers (22, 24). This could be done by changing one of the four traditional BSC perspectives or adding a new one (7). The perspectives must be related to each other and it integrated all attempts to reach the mission.

Models in the comparative research showed that the numbers of perspectives are varied from

3 to 6. The ISSO's model is designed in five perspectives. These are clinical perspective, patient perspective, internal processes perspective, finance perspective and employee growth perspective. A study of 139 hospitals had shown that clinical quality, efficiency, patient safety, customer perspective, financial perspective, and employee perspective are common perspectives (7).

Indicators must translate the strategic objectives of hospitals. Designing an indicator is a complex process. The purpose of the measure, frequency of measurement and data source has to be considered. (25) Indicators must present the cause and effect relationship in the implementation of the hospital's mission (22). Twenty seven indicators were designed that 25 of which are approved. The average indicators in the comparative study were 29. A study of 139 hospitals showed that about 30 indicators used (7). Most designers agree with 20-25 indicators. However, up to 30 indicators may be preferred (24). Each hospital should set its targets individually. The targets must be set on the past performance. They must be attainable. The targets clearly represent what a company wants to achieve and the desired result of a performance measure and these can be set by more than 20 per cent (24).

Conclusion

Balanced scorecard is one of the most successful and widely used models of performance assessment in healthcare organizations, especially in hospitals. The model is a framework for designing a set of performance measures for organization strategies. Many researches have been done for developing a suitable BSC model (25). Experience suggests that the BSC model is valuable for performance assessment. The research has presented a model based on BSC format which can be used for performance assessment in ISSOs hospitals. The model was based on a comparative study with ten successful models that were previously implemented in hospitals. The ISSO's hospitals mission statement is designed as a template. The ISSO's model is designed in five perspectives. These are clinical perspective, patient perspective, internal processes perspective, finance perspective and employee growth perspective. The proposed model can be implemented a hospital or all hospitals of ISSO and also can be used for comparing hospitals performance. Because of dynamic nature of balanced scorecard, the model is a flexible framework that could be adjusted by local situations based on differences in situations.

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An empirical study of nurses' emotional involvement

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Abstract

Objective: This research was undertaken to identify the key elements of emotional involvement in nurses through the use of a set of individual, job related and attitudinal factors.

Methods: The study was conducted as a statistical-empirical cross-sectional study. The methodology used to achieve our research objective is based on the binary logistic regression model. This statistical technique determines the probability of an event occurring -emotional involvement in this case- as compared to the probability that the opposite attitudinal state will occur. A sample involving 260 nurses was collected from the 5th European Working Conditions Survey, 2010.

Results: 230 nurses and 30 male nurses took part in the 5th European Working Conditions Survey-2010, providing information about their working environment and employment situation. 75.4% of those nurses who participated in the research proved to have a high level of emotional involvement in their workplace. There is a positive relationship between job involvement and several occupational factors.

Conclusions: As a result, it was discovered that the likelihood of feeling involved with the nursing profession increases if accompanied by three fundamental work conditions: a) employment stability with a permanent contract, b) the performance of challenging and complex tasks, and c) the opportunity to take part in organizational decisions. It is suggested that Human Resources managers should act in accordance with these organizational guidelines in the company set-up so that their nurses feel more involved and integrated in their profession.

Key words: job involvement, personal commitment, working conditions, nurse.

Introduction

In today's working environment, the management of Human Resources represents the most important sustainable competitive advantage in an organization. Product innovations can be duplicated, but the synergy of a company's workforce cannot be replaced. For this reason, it is not sufficient to merely attract talented employees; retaining them is imperative for success. In this sense, the management of emotional well being in the workplace is no longer a marginal aspect, but instead has become a key strategic and business management factor due to its ability to reorient organizations to further the fulfillment of their mission. This statement is even more important for organizations composed mainly of employees like nurses who perform complex tasks. In theory, job involvement is necessary for nurses' professional growth. It is assumed that the higher the level of involvement, the higher the degree of professional growth. Individuals who are involved, and who perceive opportunities for growth in their jobs, have less intention of quitting and are less likely to suffer burnout (1). Consequently, as Chih Ho points out, listening to and understanding the views of employees and using this information to satisfy their needs are essential steps in reinforcing commitment in a workforce (2).

Job involvement reflects the central role of an individual's performance because it represents the degree to which job performance affects an employee's self-esteem (3). The current research focuses its interest on this dimension of the performance-self-esteem contingency, which will be denominated emotional involvement (4,5,6). Emotional involvement implies a process where objective and subjective elements such as tasks, responsibilities, feelings and job performance interact with each other, generating a greater or lesser extent of involvement, which ultimately affects psychological well being and self-confidence. The analysis of the emotional

dimension of job involvement is in accordance with the studies of Feldman and Blanco (7). These authors highlight the importance of efficient emotion management in organizations given that emotions play a social role affecting the work environment in many ways, not only on an individual level. Emotional involvement forms an essential and integral part of the nursing profession as it directly affects the quality of patient care (8). A recent study (stepwise regression analysis) examines the effects of workplace factors on the job involvement of healthcare employees in a public hospital. It reveals that job involvement significantly modulates the relationship between the perception of workplace factors and quality of patient care (9).

Macey and Schneider argue that some aspects of work are intrinsically motivating and will thus affect the extent to which individuals are willing to invest their own personal energy in their tasks (10). Scientific literature defines several theoretical models for understanding the relationship between job involvement and its antecedent and outcome variables, such as the Expectancy Theory (11), the Integrated Theory (12), the Motivational Approach (13) and the Causality Theory (5). We have focused on the Integrated Theory, which reveals that job involvement is related to three types of variables: individual, job related and attitudinal factors.

The individual characteristics that are related to job involvement refer as much to demographic factors (age, gender, level of education, marital status…) as to personality traits: internal or external locus of control, self-confidence, sense of responsibility, etc. (5,12,14,15,16,17).

Other studies highlight that the phenomenon of job involvement emerges as an answer to the work conditions that the organization offers employees, focusing their interest on the five basic job dimensions of the Hackman y Oldham model which deal with the characteristics of the workplace (18): task variety, task identity, task significance, job autonomy, and feedback (1, 5, 18, 19, 20, 21, 22, 23, 24, 25, 26). This research concludes that the coherence between the characteristics of the workplace and individual expectations results in an affective reaction, which increases the level of employee job involvement.

Finally, some authors have analyzed the link which exists between job involvement and other outcome variables like job satisfaction that reveal positive and significant relationships in most cases (21, 24, 27, 28, 29, 30, 31, 32).

Methods

Design and sample

Data used in this research have been obtained from the 5th European Working Conditions Survey, carried out in 2010 by the *European Foundation for the Improvement of Living and Working Conditions*. The survey provides insight into the working environment and employment situation throughout the 27 EU Member States as well as in Turkey, Croatia, Norway, Macedonia, Montenegro, Albania and Kosovo. The target population under study were those aged 15 years and over (16 and over in Spain, the UK and Norway) who are employed and reside in the country being surveyed. The sample is a multi-stage, stratified, random sample. The total number of interviews in 2010 was 43,816. In light of the objective of this investigation, we obtained a sub-sample of 260 nurses, 75.4% of whom reported feeling job involvement (N=196), while 24.6% admitted they did not feel involvement (N=64).

In order to measure the dependent ***variable*** – the emotional dimension of job involvement-an item from the 5th European Working Conditions Survey has been used which is related to psychological well-being. Respondents were only asked one question about their individual perception regarding this topic: *are you emotionally involved in your work*? The nurses who were involved in their job were coded as 1 while those who felt alienated were coded as 0.

The codes and classification of various explanatory variables are shown in the following three categories:

- ***Individual characteristics*****:** *Marital status* (0: Single; 1: In a stable relationship), *Level of education* (0: Secondary studies, 1: University education) and *Sex* (0: Male; 1: Female).
- ***Job related factors***: Length of service (0: less than 1 year; 1: between 2 and 5 years; 2: between 6 and 10 years; 3: over 10 years), Expectations of career growth (0: No; 1: Yes), Monotonous tasks (0: Yes; 1: No), Complex tasks (0: No; 1: Yes), Flexibility in work methods (0: No; 1: Yes), Intellectual challenges in the workplace (0: No;

1: Yes), Emotional demands in the workplace (0: No; 1: Si), Support of superiors (0: No; 1: Sí), Colleague support (0: No; 1:Sí), Type of contract (0: Temporary contract, 1: Long-term contract), Position (1: Head nurse, 0: Nurse), Stress (0: Yes, 1:No), Participation in decision-making (0: No, 1:Yes).

- ***Attitudinal variables***: Satisfaction with work conditions (0: No; 1: Yes) and pay level satisfaction (0: No; 1: Yes).

Statistical Analyses

The evaluation of data obtained as a result of the study was conducted with IBM SPSS 20 (Statistical Package for Social Science). The methodology used for the fulfillment of our objective in this paper is based on the binary logistic regression model, a specific type of dichotomous response regression model. This statistical technique determines the probability an event has of occurring – emotional involvement in this case – compared to the probability of the opposite occurring; an attitudinal state (job alienation). Job alienation and involvement are two superficial phenomena of a single object, two polarized reflections of one aspect. When job involvement decreases to a certain extent, it will trigger job alienation (13).

Results

All the subjects in the sample were nurses (80.4%) or head nurses (19.6%), from the public

Table 1. Distribution of Nurses involved/alienated in their workplaces according to Socio-demographic and working characteristics

Characteristics	Socio-demographic and work-related factors Nurses involved in their workplace (N=196)		Socio-demographic and work-related factors Nurses who feel alienated in their workplace (N=64)	
	Number (n)	Percentage (%)	Number (n)	Percentage (%)
Gender				
Woman	174	88.78%	56	87.5%
Man	22	11.22%	8	12.5%
Age				
15-24 years old	9	4.59%	4	6.25%
25-39 years old	81	41.33%	31	48.43%
40-54 years old	88	44.89%	26	40.63%
55 years old or older	18	9.18%	3	4.69%
Level of education				
Secondary school	32	16.33%	41	64.06%
University education	164	83.67%	23	35.94%
Employment contract				
Long-term contract	173	88.27%	15	23.44%
Temporary contract	23	11.73%	49	76.56%
Position				
Head Nurse	44	22.45%	7	10.94%
Nurse	152	77.55%	57	89.06%
Sector				
Public	146	74.49%	39	60.94%
Private	32	16.33%	10	15.63%
Others	18	9.18%	15	23.44%
Job satisfaction				
Yes	162	82.65%	52	81.25%
No	34	17.35%	12	18.75%
Stress				
Yes	16	8.16%	28	43.75%
No	180	91.83%	36	56.25%

sector (81.5%) and private sector (18.5%). 88.5% were women and 11.5% men. The average age was 40.02 years. Finally, 21.2% had secondary education and 78.8% had completed studies at university.

Table 1 compares some of the main socio-demographic characteristics of nurses involved (N=196) and those who feel alienated from their work (N=64). Furthermore, it can be observed that there is no difference regarding gender, age or level of satisfaction. However, emotional involvement is even more acute among nurses who have university studies (83.67% compared to 35.94%), permanent contracts (88.27% compared to 23.44%), personnel under their supervision (22.45% compared to 10.94%), who work in the public sector (74.49% compared to 60.94%) and who do not suffer stress in their daily work (91.83% compared to 56.25%) as opposed to nurses who feel alienated in their workplace.

Table 2 presents the results of the estimation carried out through a logistic regression using those factors that determine the level of involvement of nurses in their respective jobs. The contrast statistic applied to assess the validity of the model (Hosmer-Lemeshow analysis; the Chi-square test: 1.013; Sig. 0.603), on the whole, points out that there are enough reasons to accept its validity, that is to say, to affirm that the set of job related variables taken into account in the general model of our research can satisfactorily explain whether a nurse is emotionally involved in his/her work and to what degree.

It should also be highlighted that the variables used give the model a significant ability for generalization, which indicates its efficiency for the purpose of prediction. The logistic regression model correctly classifies 80.4% of the individuals under consideration, increasing to 93.2% for those nurses who feel involved with their profession. The general model shows how the probability an employee has of being emotionally involved with work increases among those individuals who have greater job stability -are employed under a long-term contract–, who perform highly complex tasks and who participate in decision-making processes related to their jobs.

Thus, the variables related to the job are those that predetermine the development of attitudes such as job involvement, and become the critical variables for understanding the phenomenon under study. Therefore, any individual and attitudinal variables are decisive for the development of feelings of job involvement in the nursing staff studied.

Nevertheless, each of the three job-related factors which are significant in measuring the probability of more or less emotional involvement has a different impact from the others, as indicated by the analysis of confidence intervals obtained in the corresponding *odds ratios* (see Table 2). The variable with the greatest influence in emotional involvement is that of job stability. The probability of nurses with permanent contracts feeling involved with their profession is 736.0% compared to their colleagues with short-term contracts (CI: 2.257-23.996).

Moreover, carrying out complex tasks triples the probability of developing feelings of emotional involvement in nursing personnel, reaching an *odds ratio* coefficient of 3.046 and a confidence interval ranging from 1.156 to 8.021.

Finally, the logistic regression model also highlights that participation in decision-making contributes to the development of feelings of involvement. The OR corresponding to this variable (2.518 with a confidence interval between 0.990 and 6.404) suggests that nurses who can express their opinions about the content and development of their jobs are quite possibly more motivated and, perhaps due to this, develop a greater degree of emotional involvement in their work.

Table 2. Logistic regression: factors that determine job involvement (Confidence intervals for the odds ratio)

	Variables in the model				Odds ratios 95% C.I. for OR		
	B	S.D.	Wald	Sig.	OR	Lower	Upper
Type of contract (0: Temporary; 1: Long-term)	1.996	0.603	10.958	0.001	7.360	2.257	23.996
Complex tasks (0: No; 1: Yes)	1.114	0.494	5.081	0.024	3.046	1.156	8.021
Participation in decisions (0: No; 1: Yes)	0.923	0.476	3.759	0.053	2.518	0.990	6.404
Constant	-2.068	0.804	6.613	0.010	0.126		

Discussion

The nursing profession involves great responsibility in the life, health and care of others (33). In order to successfully compete in the healthcare environment, and attract and retain the most qualified and experienced nurses, it is important for organizations to implement strategies that increase job commitment (34). In this research, 75.4% of nurses describe themselves as emotionally involved in their profession. The overall rate of job involvement was detected to be 56.8% (35) or 25.3% (36) in previous studies carried out on this issue in Europe and only about one third of the American workers are involved in their work meaning they are emotionally disconnected from their workplaces and are less likely to be productive (37). According to these results, it is thought that nurses' rate of personal job commitment is higher than average when compared to that of all employees in any occupation in any other sector of activity.

Lodahl and Kejner conducted a research using 137 nurses, revealing how the age of nurses correlated positively with job involvement ($r=0.26$, $p<0.01$) (3). Chuang demonstrated that nursing staff with varying education levels enter their jobs with varying levels of personal commitment (38). Staff with higher educational levels generally showed higher levels of job involvement. Abboushi also found that education had a positive relationship with job involvement (39). Tang found out that exist a statistically significant relationship between age and job involvement (16). Morrow, McElroy and Blum argued that position within an organization is a good predictor of job involvement because, "higher level positions provide more stimulating and challenging tasks and therefore the opportunity for greater involvement" (40). In spite of these evidences, when sets of independent variables grouped into three categories were compared in our research, it was determined that nurses' sociodemographic features and attitudinal factors do not influence job involvement. These results are similar to those studies that concluded that job involvement is even more predictable when taking into account job-related factors (1, 12, 26, 41). Although sociodemographic features do not influence in the state of involvement of our logit regression model, the results of the descriptive analyses suggest that nurses emotionally involved in their workplace have a university education, enjoy better work stability, work in the public sector, take on supervisory tasks and suffer lower levels of stress (Table 1).

Stepwise regression analysis of the data reveals that the employees' type of contract influences the feelings towards the content of the work. Thus, nurses' probability of feeling job involvement increases among those who have a long-term contract. Cuyper et al.'s study reveals that work involvement among employees who have a certain amount of independence in their jobs is much more intense when the worker has a permanent contract linking him/her to the company (42). Permanent contracts contribute to the nurse's feeling of security, and are at the same time perceived to be a sign of the organization's confidence in its employees. In this context the emotional relationship of the worker with the professional activity undertaken goes beyond a strictly business relationship, adding a further commitment that will also be reflected in the company's performance. A recent study shows that involvement in one's work explains a great deal of individual endeavor. (43).

The complexity of the work to be done also determines the level of emotional involvement. This result coincides with the study of Brown, who observed a positive correlation between emotional involvement in one's job and the complexity of the work at hand (5). Thus, taking on more stimulating and challenging tasks implies greater opportunities for encouraging nursing personnel's personal commitment.

Finally, the logistic regression model indicates that participating in important decisions explains the increase in the commitment of nurses to their work. It should be kept in mind that the opinion of workers with respect to their work activity (for example, in the establishment of self-evaluation criteria) stimulates work involvement (5,12,17,44,45). In the future, unless organizations are able to meet a range of employee needs, employees cannot be expected to be highly involved to their work (46).

Conclusions

The present study has important implications for initiating changes in the hospital system where no systematic study has yet been conducted to determine the effects of workplace factors on the job involvement of healthcare professionals.

The multidimensional model obtained in this research identifies the profile of the nurse who is emotionally involved in his/her work. The probability of feeling emotional involvement in the nursing profession is conditioned by three fundamental variables: a) job stability through permanent contracts, b) the carrying out of complex tasks, and c) the chance to participate in organizational decisions. The findings of the present study have implications for those organizations, which are attempting to enhance organizational performance through increased job involvement. A deep understanding of job involvement and its antecedent influences has the potential to enrich a fundamental aspect of human experience at workplace and contribute to heightened productivity in organizations. It is suggested that those in charge of personnel management take these parameters of organizational design into account to encourage nurses to feel more involved in the exercise of their profession. This study provides a theoretical and empirical basis for further study of nursing issues in Europe.

Limitations of the study

Despite the scientific interest in the findings mentioned, some methodological limitations should be considered. The first limitation of our study was the small simple size and the fact that the sample was self-selected. Secondly, job involvement has been measured through self-awareness and, therefore, the corresponding bias in the key variable must be assumed. Finally, the casual relationship between emotional involvement and the variables taken into account in our study must be relativized, as the data under study are cross-sectional and not experimental. Future studies need to be conducted with larger samples and a longitudinal study.

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Enuresis: regional primary boarding school in sinop, the northest point of Turkey

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Abstract

Introduction and Aim: Enuresis is a urine voiding impairment and it means repeated involuntary urine voiding. While enuresis more commonly occurs in children, it can also occur in adults. According to DSM IV, enuresis is repeated involuntary voiding of urine into bed or clothes. Involuntary voiding of urine which has the frequency of at least twice a week for at least 3 consecutive months is a significant symptom. This study aims to determine the enuresis prevalence and the factors affecting enuresis among the students of regional primary boarding schools in Sinop.

Materials and Methods: This descriptive study was conducted on the students of nine Regional Primary Boarding Schools (RPBS) dependent on Province National Education Directorate of Sinop between 1 October 2010 and 1 October 2011after the required verbal and written permissions were taken to carry out this study. The target population of this study was 1500 students who were studying in the nine Regional Primary Boarding Schools (RPBS) dependent on Province National Education Directorate of Sinop and agreed to enroll in the study, and the sample selection was not performed.

Results: 55 % of the respondents were male and 45 % of the respondents were female. The age of 51% of the respondents were 9-12, that of 40.3% were 13-16, and that of 8.7% were 5-8. 92.4% of the respondents were from the villages. It was found that 93.3% of the children lived with their parents while 71% of children lived with elders of family. It was also reported that parents of 30.5% of the children were relative, and 1.9 % of the children had stepfathers while 2.8% of children had stepmothers. As a result of the study, the frequency of enuresis was found as 11.7%. The rate of nocturnal enuresis frequency was found as 7.1% while that of diurnal enuresis was found as 4.6 %. In the evaluation of the age groups of the children in the study, nocturnal enuresis frequency was 13.8% in the age group 5-8 while diurnal enuresis frequency was 10.8%, which were significantly higher than that of other age groups.

Conclusion: As a result, nurses play a significant role in solving the enuresis problem which can affect the whole lives of children. It is important to assess both children and their families as a whole in this respect.

Key words: Students, Enuresis, Diurnal, Nocturnal.

Introduction

Enuresis is a voiding urine impairment and means involuntary repeated voiding of urine. While enuresis more commonly occurs in children, it can also occur in adults. According to DSM IV, enuresis is repeated involuntary voiding urine into bed or clothes. Involuntary voiding of urine which has the frequency of at least twice a week for at least 3consecutive months is a significant symptom. To be diagnosed as 'enuretic', a child must be at least five years old. Enuresis can be divided into two types: involuntary voiding urine at night and involuntary voiding urine during daytime. Involuntary voiding urine at night is called nocturnal enuresis, while involuntary voiding urine during the daytime is called diurnal enuresis. Nocturnal enuresis is a more common type. While nocturnal enuresis occurs more frequently in males, diurnal enuresis occurs more frequently in females.

If the enuresis of a child has continued since he was born, the condition is called primary enuresis (primary urinary incontinence). If a child begins wetting after he has established urine control for six months or a year, the condition is called secondary enuresis (secondary urinary incontinence)(1).

Genetic predisposition, improper toilet training, low socio-cultural level, bad living conditions are among ethological factors of enuresis. To be dia-

gnosed with enuresis, a child should be checked for especially whether or not he has any organic pathology. If he doesn't have, enuresis should be suspected. The children with enuresis usually show psychiatric symptoms. It is reported that 20 % of children with enuresis have a learning disability, and psychic problems such as hyperactivity. It is also reported that that the psychic problems associated with stressful life events such as the birth of sibling, the first week of school, and fear more commonly appear in the secondary enuresis (1).

The aim of this study is to investigate the enuresis prevalence and the factors affecting enuresis among the students studying in Regional Primary Boarding Schools in Sinop.

Materials and methods

This descriptive study was conducted on the students of nine Regional Primary Boarding Schools (RPBS) dependent on Province National Education Directorate of Sinop the study was carried out between 1 October 2010 and 1 October 2011 after the necessary verbal and written permissions were obtained.

The target population of this study was 1500 students accepting to enroll in the study who were studying in the nine Regional Primary Boarding Schools (RPBS) dependent on Province National Education Directorate of Sinop, and the sample selection was not performed.

The Information Form consisting of 37 questions, which was developed by the researchers, was used to collect the data. The information form included questions to collect information about urine voiding, and demographic features of students. Data were collected through the interview with students by their teachers during the periods in which they were studying in the school.

SSPS 10.0 packet program was used in the evaluation of the data. In the statistical analysis percentage and chi square tests were used, and the results were evaluated in confidence interval 95% and on the significance level of $p< 0.05$.

Results

Results were divided into two categories: the findings about socio-demographic features of the students, and the findings about the urination frequency and its reasons. After the evaluation of the socio-demographic features of the respondents, it was reported that 55 % of the respondents were male and 45 % of the respondents were female. The age of 51% of the respondents was 9-12, that of 40.3% was 13-16, and that of 8.7% was 5-8. 92.4% of the respondents were from the villages. It was also found that 93.3% of the children lived with their parents while 71% of the children lived with elders of family. It was reported that parents of 30.5% of the children were relative, and 1.9 % of the children had stepfathers while 2.8% had stepmothers. As a result of the study, the frequency of enuresis was found as 11.7%. The rate of nocturnal enuresis frequency was found as 7.1% while that of diurnal enuresis was found as 4.6 %.

It was determined that mothers of %84.5 of children and fathers of %77.7 of the children were not literate, while %94.1 of the mothers was housewives and 41.4 % of fathers were workers. It was also reported that 59.4 % of the families had incomes under 500, 00 TL and 27% of families had incomes between 500.00 – 1000 TL (Table 1).

When the features of children concerning family and school were analyzed in the findings of the respondents about the frequency of involuntary voiding urine and its reasons, it was found that 49.1 % of the children visited their families every weekend while 45.1% of children scarcely visited their families. Moreover, it was determined that 94.2 % of respondents were boarders while 5.8 % of the respondents were not boarders, and 55.1 % of the respondents did not choose to study in the boarding school themselves while the families of 60.8% of the respondents chose the boarding school (Table 2).

As for the psycho-social features of the students, the students reported that 71.8% of them felt happy while 32.3% of them felt very anxious, and 35.9% of them usually felt alone. It was found that 67.5% of the children had a good relationship while 29.8% of the children had not good but not bad relationship and %2.7 of the children had a bad relationship with their schoolmates (Table 3).

When the school achievements were evaluated in terms of respondents' involuntary voiding urine, it was found that school performances of 33.3% , 7.9% and 19.5% of the children who involuntarily void urine at night were good, average and bad,

Table 1. Distribution of the Socio-Demographic Features of the Children in the Study

Features	The number	%
Age		
5-8	130	8.7
9-12	765	51.0
13-16	605	40.3
Sex		
Female	675	45.0
Male	825	55.0
Place of living		
Province	19	1.3
District	60	4.0
Town	35	2.3
Village	1386	92.4
Living with parents		
Yes	1399	93.3
No	101	6.7
Mother		
Alive	1471	98.1
Dead	29	1.9
Father		
Alive	1445	96.3
Dead	55	3.7
Mother		
Natural	1458	97.2
Step	42	2.8
Father		
Natural	1472	98.1
Step	28	1.9
Mother's educational level		
Not literate	1268	84.5
Primary school	120	8.0
Secondary school	24	1.6
High school	13	0.9
University	75	5.0
Father's educational level		
Not literate	1166	77.7
Primary school	185	12.3
Secondary school	63	4.2
High school	52	3.5
University	34	2.3
Mother's occupation		
Housewife	1412	94.1
Civil Servant	8	.5
Worker	40	2.7
Others	40	2.7
Father's occupation		
Housewife	104	6.9
Civil servant	67	4.5
Worker	621	41.4
Others	708	47.2
Income of Family		
5.000 and under	891	59.4
500-1000	405	27.0
1000-2000	130	8.7
2000 and above	74	4.9
Living with an elder of family		
Yes	1065	71.0
No	435	29.0
Relative parents		
Yes	458	30.5
No	1042	69.5

respectively. It was also found that school performance of 2.7%, 5.2% and 15.6% of the children who involuntarily void urine during daytime were good, average and bad, respectively(Table 4).

Table 2. Distribution of the Children According to the Family and School Features in the Study

Features	The number	%
How often do you visit your family?		
Every weekend	736	49.1
Scarcely	676	45.1
Not Boarder	88	5.8
Did you choose to study in the boarding school on your own?		
Yes	587	39.1
No	827	55.1
Not Boarder	86	5.8
Did your family choose the boarding school?		
Yes	913	60.8
No	501	33.4
Not boarder	86	5.8

Table 3. Distribution of the Children According to the Psychosocial Features

Features	The number	%
Do you usually feel happy?		
Yes	1077	71.8
No	423	28.2
Do you too often feel anxious?		
Yes	484	32.3
No	1016	67.7
Do you usually feel alone?		
Yes	539	35.9
No	961	64.1
How are your relations with your schoolmates?		
Good	1012	67.5
Average	447	29.8
Bad	41	2.7

In the evaluation of involuntary voiding urine features of the respondents in terms of age and sex, it was found that the rate of involuntary voiding urine at night in 5-8 age group children was 13.8% while the rate of during daytime was 10.8 %. These rates were higher than those of other age groups. As for sexes, the rate of involuntary voiding urine at night in male children was 7.6% while it was 6.4% in female children (Table 5)

Table 4. School Performances of the Students According to Urinary Incontinence in the Study

School performance	Urinary incontinence at night (Nocturnal enuresis)				Urinary incontinence during daytime (Diurnal enuresis)				Total	
	Yes		No		Yes		No			
	n	%	n	%	n	%	n	%	n	%
Good	32	33.3	64	66.7	18	2.7	655	97.3	673	44.9
Average	59	7.9	691	92.1	39	5.2	711	94.8	750	50
Bad	15	19.5	62	80.5	12	15.6	65	84.4	77	5.1

** Line percentage was written in Total.*

Table 5. Distribution of the Urinary Incontinence Features of the Children In Terms Of Age and Sex in the Study

Age	Urinary incontinence at night (Nocturnal enuresis)				Urinary incontinence during daytime (Diurnal enuresis)				Total	
	Yes		No		Yes		No			
	n	%	n	%	n	%	n	%	n	%
5-8	18	13.8	112	86.2	14	10.8	116	89.2	130	8.7
9-12	68	8.9	697	91.1	39	5.1	726	8.1	765	51.0
13-16	20	3.3	585	96.7	16	2.6	589	97.4	605	40.3
Sex	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Female	43	6.4	632	93.6	33	4.9	642	95.1	675	45.0
Male	63	7.6	762	92.4	36	4.4	789	95.6	825	55.0

** Line percentage was written in Total.*

Table 6. Distribution of urinary incontinence features of the children in terms of sleep in the study

Deepness of sleep	Diurnal enuresis						Nocturnal enuresis					
	Yes		No		Total		Yes		No		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Do you immediately wake up when you hear a sound or noise during sleep?												
Yes	40	4.3	893	95.7	933	62.2	66	5.3	1184	94.7	1250	83.3
No	29	5.1	538	94.9	567	37.8	40	16.0	210	84.0	250	16.7
Do you feel when you feel the need to void urine during sleep?												
Yes	67	7.2	866	92.8	933	62.2	54	4.0	1284	96.0	1338	89.2
No	39	6.9	528	93.1	567	37.8	15	9.3	147	90.7	162	10.8
Do you wake up and go to toilette when you need to void urine during sleep?												
Yes	55	4.4	1195	95.6	1250	83.3	74	5.5	1264	94.5	1338	89.2
No	14	5.6	236	94.4	250	16.7	32	19.8	130	80.2	162	10.8

** Line percentage was written in Total.*

When the involuntary voiding urine features of the children were evaluated in terms of sleep, it was found that the rate of nocturnal enuresis was 5.3% in those who woke up immediately after they heard a noise or sound while the rate was 16% in those who could not wake up. The rate of nocturnal enuresis was found as 4% in the children who felt the need for voiding urine during sleep while it was found as 9.3% in the children who could not feel (Table 6).

Discussion

When the study results were evaluated, it was found that general frequency of enuresis was 11.7%. The frequency of nocturnal enuresis was 7.1% while that of diurnal enuresis was 4.6%. In the study of Öge and colleagues, the frequencies of nocturnal enuresis and diurnal enuresis were found to be 11.6% and 0.8%, respectively. Moreover, Öge and et al. reported that this finding belon-

ging to children in Turkey was not much different from those of Europe and Middle East (2). Göv and Gönener also reported that nocturnal enuresis and diurnal enuresis were 76.7% and 9.2% in their study respectively, which supports the concerning research result (7). Moreover, this result complies with 12.6% nocturnal enuresis prevalence and 0.46% diurnal enuresis prevalence rates in the adolescents in the study of Bozlu and colleagues (3), in addition to the fact that nocturnal enuresis is more common than diurnal enuresis in society (1).

When the age groups of the respondents were analyzed, the frequency of nocturnal enuresis and diurnal enuresis were 13.8% and 10.8% in the age group 5-8, respectively, which were significantly higher than those of other age groups. In the literature, this result shows parallelism with the fact that nocturnal enuresis decreases when as a patient gets older (1, 4, 5).

The nocturnal enuresis rate were 7.6 % and 6.9% in male and female respondents while the diurnal enuresis rates were 4.9% and 4.4 % in female and male respondents, respectively. Although it was not statistically significant, it was found that nocturnal enuresis was higher in males while diurnal enuresis was higher in females. The fact that the frequency of enuresis is higher in males than females overlaps the result of the study of Görür and colleagues in Hatay (6) reporting that the frequencies of enuresis were 10.7% and 7.4% in males and females, respectively, as well as the result of Öge and colleagues' study reporting that the enuresis more commonly occurs in males than females. (2)

As for school performances of the children with nocturnal enuresis, 19.5%, 7.9% and 4.8% of respondents were found to be bad, average and good, respectively while 15.6%, 5.2% ,and 2.7 % of the children with diurnal enuresis were found to be bad, average, and good, respectively. It is clear that both enuresis types significantly affect the school performance. In their studies, Chang and colleagues (8) reported that the school performances of the children with enuresis were lower, and Gülsün and colleagues (9) reported that the children with enuresis could think that they had difficulty in maintaining their education, which show parallelism with the concerning research result (8,9).

When the deep sleep of the students involved in the study and enuresis were evaluated together, it was found that there was a statistically significant relationship between nocturnal enuresis and inability to get up immediately when hearing a noise or sound during sleep, inability to feel the need for voiding urine, and inability to wake up to go to toilet. Özer and colleauges (4), Akbaba and colleauges (5), and Kahriman and colleagues (10) reported a significant relationship between deep sleep and enuresis in their studies, which supports the concerning research result. Moreover, Bascom and colleagues (11) conducted a study to investigate the relationship between sleep-disordered breathing and enuresis. They found significant relationships between them and stated that it is important to pay attention to this risk for all the pediatric health team (4, 5, 10, 11).

Genetic predisposition is one of the etiological factors of enuresis (1). In our study, the enuresis history rate was found as %19.8 in the parents of the children with nocturnal enuresis while this rate was found as %12.9 in the parents of the children with diurnal enuresis. The relationship between parents and two enuresis types was statistically significant. Jarvelin and colleagues carried out a study including 3206 children with enuresis in 1988. According to this study, in the case that the father is enuretic after age 4, the risk for enuresis in the child increases by 7.1 times. However, in the cases of enuretic mother, the risk for enuresis in the child increases by 5.2 times. These findings support the concerning research result (12). Öge and colleagues (2) mentioned enuresis family history as one of the most important factor associated with enuresis and Ergüven and colleagues (13), Ünalan and colleagues (14), Kahriman and colleagues (10) reported that there was a significant relationship between enuresis family history and enuresis. These findings support the concerning research result (2, 10, 12, 13, 14).

Restlessness in the respondents is seen in the cases of both enuresis types. 10.5 % of the children with nocturnal enuresis expressed restlessness while 5.4% of the children reported that they did not experience any restlessness. 6.8 % of the children with diurnal enuresis expressed restlessness while 3.5% of the children reported that they did not experience restlessness. The number of the children with enuresis and restlessness was almost more than twice the number of the children

with enuresis but without restlessness. Moreover, the relationship between enuresis and restlessness was statistically significant.

While hardships of living and psychosocial factors can trigger the enuresis, the enuresis also affects the quality of live. In the study of Özçetin and colleagues, for instance, the quality of life of the children complaining involuntary voiding urine was 12.05 times worse than that of the children without the complaint of involuntary voiding urine *(15).*

In the study in which psychological factors of enuresis were studied, it was found that the enuretic children were less trustfully dependent than control group, and the cases of low self-respect and behavioral disorders were more than those of control group (16). Looking the psychodynamic explanations about enuresis in their study, Bodur and Soysal reported that a child experienced anxiety due to regressive reactions to the birth of sibling, death, separation or severe communication difficulties within family, and inability to use proper defense mechanism against anxiety, and he could express that anxiety with enuresis (17). Toros and colleagues reported that the increased level of anxiety, by causing the muscular response to the not-stable detrusor activity not to be sufficient, causes the enuresis to be more common in their study of biopsychosocial assessment of enuretic children (18). In the study of Özyürek and Demiray (١٩), which aimed to compare the anxiety levels of secondary school students who stayed in the dormitory or with their families, it was found that constant anxiety level was significantly higher in the children who were staying in dormitory than that of students who were staying with their families. These results show parallelism with the relation between restlessness and the enuresis frequency. In the study on developing the scales for anxiety resources in school-age children, the statement 'to think that I will not be a successful student' was determined as the most worrying statement in the scale. Adults' and peers' thoughts about oneself and school performance is very important for school-age children. Therefore, the fact that this anxiety can increase in school-age children is supported by the literature (7).

Primary evaluation of the children with enuresis which doesn't require any invasive and radiological treatment can be usually done by a doctor or a well-educated nurse easily (20). The descriptive management roles of nurses play an important role in children's effectively dealing with the enuresis problem, and nurses try to protect children's biopsychosocial health and educational achievements (21).

In the evaluation in terms of sex, as Canbulat and Yildiz stated, enuresis is significantly more common among males than females in the world (22). According to İnal, taking the distribution of students in regional boarding school into account (23), it can be offered that more studies can be carried out in the regional boarding schools, especially on male students of these schools, by reporting that the number of male students is higher than the number of female students.

As a result, nurses have a very significant role in the enuresis problem which can have a negative impact on the whole lives of the children. That is, they have important responsibilities for risk management and guidance to the current cases. Moreover, nurses can create awareness for enuresis in parents, as well as carefully following development and growth of children.

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Combined oral contraceptives and increasing cardiovascular risk: thromboembolism and hypertension

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Abstract

Background: Hormonal contraceptive pills are the most used reversible method for familiar planning in Brazil. The combined pill, with synthetic analogs of estrogen and progestin, is employed by 25% of Brazilian female population. Its use provokes an increase of blood pressure levels, takes patient to a hipercoagulability state and predisposes her to thromboembolic events.

Purposes: We aimed to describe mechanisms of hypercoagulability promoted by oral combined contraceptives, to analyze the relative risk of cardiovascular events within users and to list the most common circulatory pathologies in these patients.

Methods: Three virtual medical databases were surveyed (Pubmed/Medline, BVS/LILACS and Scielo). Twelve studies were selected: clinical trials, case reports and articles of indexed medical periodic originally published in Portuguese and English about synthetic hormones, oral contraception, coagulation disorders and cardiovascular morbimortality.

Results: Synthetic estrogen promotes an increase of some clotting factors' levels (VII, VIII, IX, X, XII, XIII and fibrinogen), such as a reduction of their inhibitors (S protein and antithrombin). Because of this, etinilestradiol is the component most related to venous thrombosis and ischemic diseases of brain and heart. It also improves the releasing of hepatic angiotensinogen, taking to a increase of blood pressure levels.

Conclusions: The prescription of oral combined contraceptives needs criteria, notably due to adverse effects of etinilestradiol. It is recommended to avoid the administration of these drugs for patients elder than 35 year-old or with risk factors. For these patients, the use of progestagen-only pills seems to be safer.

Key words: contraception, hormone, estradiol, thromboembolism.

Background

Oral contraceptives or birth control pills are known medications employed on familiar planning. They are the most used reversible method to avoid pregnancy in Brazil and worldwide. About 25% of Brazilian female population makes chronic use of this kind of medication. It is also the contraceptive method referred as the most know by women: 87.4% of them cited pills[1].

The hormonal contraceptives include four basic types: combination oral contraceptive pills (usually referred as COC or OCP), progestin-only pills, injectable and implants[2]. They are noted to work by three different mechanisms: the inhibition of ovulation by suppression of hypothalamus-pituitary-ovarian axis, through cancelling gonadotrophin releasing; the inhibition of sperm transport through the cervix by thickening the cervical mucus; the changes in endometrial lining, decreasing possibilities of implantation ("hostile endometrium theory")[3].

Young women should present low rates of stroke and thromboembolic events incidence. However, since the widespread use of oral contraceptives, around 1970, the incidence levels of these ischemic episodes became progressively greater. Several studies and clinical trials tried to

demonstrate the relationship between the use of hormonal contraceptive methods and an increased risk for some cardiovascular pathologies[4]. They disclosed effects of synthetic estrogens of contraceptives on disturbing the homeostatic balance of clotting factors, what, in last analysis, carries to developing of ischemic pathologies.

Efforts to decrease the risk of arterial thrombosis led to development of low-dose combined contraceptives, containing 50 or less micrograms of etinilestradiol. Industry also made efforts to develop new generations of drugs, especially on progestogen-only pills. Other synthetic progestogens like levonorgestrel composes a lineage called second-generation oral contraceptives, which promote a smaller influence on cardiovascular risk[5].

In addition to the influence of oral contraceptives on coagulation and clotting factors, the high effectiveness of synthetic hormone contained on these drugs changes the metabolism of mineralocorticoids and increase blood pressure levels[6], predisposing some patients to hypertension and amplifying even more their risk for cardiovascular injuries.

Methods

Three virtual medical databases were surveyed (Pubmed/Medline, BVS/LILACS and Scielo). The terms ued were "combined oral contraceptive", "etinilestradiol", "progestagen", "ischemic events", "cerebrovascular accidents", "deep-vein thrombosis" and "coagulation", separated or associated. This search returned 54 papers in 5 languages.

It was made a selection in between these results. Twelve studies were chosen: clinical trials, case reports and articles of indexed medical periodic originally published in Portuguese and English with similar purposes and relevant information. We reviewed this data in addition to reference lists of books and guidelines regarding to familiar planning, cardiology and gynecology.

Results and discussion

Three primary influences are related with the development of thrombus and are part of Virchow's triad: endothelial lesion, stasis or turbulence of blood flow and hipercoagulability. Etinilestradiol and synthetic progestogens, substances contained on combined oral contraceptives, are related with changes on third of these factors: hypercoagulability[2,3].

Synthetic estrogen promotes a strong increase of fibrinogen, VII, VIII, IX, X, XII and XIII clotting factors. In addition to this increase, occurs a reduction of S protein and antithrombin, their natural inhibitors[2]. This balance between pro-coagulant and anti-coagulant factors, with a major expression of the first, results in a hypercoagulability state that turns patients more susceptible for developing clots and having thromboembolic events, possibly taking them to death.

Etinilestradiol, the synthetic analog of endogenous estradiol employed on most of the contraceptive pills, is the isolated component that most predisposes the users of oral contraceptives to deep-vein thrombosis and cerebrovascular and myocardial ischemic diseases[5]. This predisposition represents an effective risk increase, but is not influenced by the augment of synthetic estradiol dose[6]. The progestin-like components of combined pills seem do not influence arterial events, what represents a slighter risk exposition for those patients using progestogen-only contraceptives[7].

Etinilestradiol, has an effect which is 1.000 times more powerful than the natural estradiol, considering similar quantities and concentrations[2]. Because of this, it has an important effect on stimulating liver to release hepatic angiotensinogen. Consequently, this angiotensinogen, independently on natural renin-angiotensin-aldosterone complex, takes to a systemic vasoconstriction and elevates the blood pressure levels[8].

Some of progestogens have a not well-established effect opposing to mineralocorticoid substances, notably aldosterone[9]. But the releasing of hepatic angiotensinogen provoked by oral contraceptives' etinilestradiol seems to overpass this anti-mineralocorticoid effect, increasing, therefore, the levels of arterial pressure. In a paradoxal way, the prescription and use of etinilestradiol and similar drugs in women after menopause have the opposite effect, relaxing vascular musculature, widening the lumen of blood vessels and resulting in a decrease of pressure[6,9].

Approximately 50-70% of stroke in women are embolic events[10]. The first report of stroke occurrence in women using oral contraceptives was

published in 1962, followed by many others[7]. Several pathologies can be related with chronic-use of hormones with objective on avoid pregnancy. Most of them have its origins on thromboembolic episodes. These events occur when a clot causes an occlusion of the lumen of an artery or a vein. The clinical signals will depend on where this clot is impacting blood flow and for how long it have been there, obstructing perfusion. Some of these pathologies, like ischemic cerebrovascular accidents or acute myocardial infarction, can take patients to death in minutes. Other conditions, although do not kill patient as fast as these, can cause several problems and disabilities.

For example, the chronic use of oral contraceptive pills accounts on 9-18% of all mesenteric thrombosis episodes in young women[8], on about 22% of pulmonary thromboembolism[12] and on over 60% of deep-vein thrombosis[13]. These are conditions who, if do not kill patient fast, can provoke several injuries.

Medical literature records disclose that the use of any type of oral contraceptives increases the risk of ischemic stroke[14]. The 2002 RATIO Study confirms the existence of a 2-fold risk rate for patients in chronic use of generic contraceptive pills compared with those who do not use. Obviously, the increase of risk rates is even more elevated when in combination with the presence of other clinical or lifestyle conditions, like smoking, systemic hypertension, hypercholesterolemia or obesity. In this study, almost all of the sample patients were Caucasian. That's why its findings probably should be limited to this ethnic group.

RATIO Study also revealed that this increase risk tendency for stroke in patients using contraceptives is observed in using of any type of oral contraceptives, even progestagen-only pills, which seem to be safer, due to lack of etinilestradiol and consequent minor pro-coagulation effects. In patients aged 18 to 29 years, Odds-ratio index was lower, probably due to high prevalence of oral contraceptives use on this age-group. 81% of this age-group women used hormonal therapy to avoid pregnancy, versus 78% of general sample[9].

The World Health Organization study, more recently, and many others, tried to find a relationship between estrogen and progestin dose and the increased cardiovascular risk for the users, but all of them failed on find a trend according to estrogen dose after adjustment of progestogen types[13,15]. In addition to this, some studies approaching the effect of hormonal contraceptives for ischemic strokes do not show important influence of estrogen dose[16]. Almost all of them are focused on comparison between second-generation and third-generation combined contraceptive pills[17].

Conclusion

Information about risks inherent to combined oral contraceptives can make doctors more attentive to its prescription and patient more conscious about potential risks of these chronic-use drugs.The prescription of combined contraceptives needs criteria, notably due to adverse effects of etinilestradiol, present in almost all of formulations.

Medical literature considers it is strongly recommended to avoid the administration of these drugs for patients elder than 35 year-old or with associated risk factors, such as hypertension, diabetes mellitus, hypercholesterolemia, smoking or alcohol. For these patients, the use of progestagen-only pills seems to be safer, due to minor influence of progestagen components on promoting hypercoagulability. Second-generation contraceptives are already widely available and represent, nowadays, the safest option on oral contraception.

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Effects of hyperoxic air on simple visual matching task performance and blood oxygen saturation of ADHD children

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Abstract

This study attempted to identify the effect of hyperoxic air on simple visual matching task performance and blood oxygen saturation (SpO_2 (%)) of Attention Deficit Hyperactivity Disorder (ADHD) children. Sixteen boys (mean age=12.8, SD=1.4 year) who were diagnosed as ADHD and are under treatment, participated in the study. Two subsets of simple visual matching tasks with similar difficulties were developed. The experiment consisted of visual matching tasks performed under two conditions: normal air (21% oxygen) and hyperoxic air (92% oxygen). The experiment consisted of three phases, which included the Adaptation phase (1 min.) after oxygen administration, the Control phase (2 min.) that maintained a stable condition before the task, and the Task phase (2 min.) that performed simple visual matching task. SpO_2 was measured during all the phases. There was a significant increase in accuracy rate in the presence of 92% oxygen compared with the 21% oxygen condition. When 92% oxygen in the air was supplied, the SpO_2 increased compared to that under the 21% oxygen condition. This result supports the hypothesis that hyperoxic air increase oxygen saturation level in the blood, lead to more available oxygen to the brain, thus increase cognitive performance of ADHD children.

Key words: Hyperoxic air, Simple visual matching task, Cognitive performance, Blood oxygen saturation, ADHD children

Introduction

There have been reports that hyperoxic air has a positive influence on cognitive abilities of healthy young adults, such as visuospatial and verbal ability, memory, n-back tasks, and addition tasks (1, 2, 3, 4, 5, 6, 7, 8, 9). Supply of hyperoxic air increased blood oxygen saturation (SpO_2) and improved cognitive abilities by increasing the percentage of correct answers (1, 2, 3, 4, 6, 7, 8, 9). However, these previous studies focused on healthy young adults, and there were no reports on changes in cognitive ability in patients with cognitive problems, such as Attention Deficit Hyperactivity Disorder (ADHD) patients.

It was reported that ADHD children have the difficulty in cognition because they have some problems relating to attention, problem solving, memory, and language (10, 11). The ADHD children have a trouble in maintaining the level of attentiveness appropriate for their age (12). Due to distraction as well as less concentration, they tend to move one activity to another activity with ease (12). In addition, they tend to be readily distracted and forgetful (12, 13). Therefore, it can be expected that the supply of hyperoxic air may have a positive effect on cognitive performance in ADHD children who have cognitive problems.

The purpose of this study was to investigate how hyperoxic air affects the cognitive ability of the ADHD children. For this purpose, due to the supply of hyperoxic air, changes in blood oxygen saturation (SpO_2) and cognitive performance were measured. In this study, a simple visual matching task which relates to attention and problem solving with a low level of difficulty was used as a cognitive task for ADHD children.

Methods

Sixteen boys (mean age=12.8, SD=1.4 year) who were diagnosed as ADHD by a psychiatrist and are under treatment, participated in this study. They had no disease and abnormality in a respiratory system and a periphery vascular flow system.

The subject boys were diagnosed as ADHD at the average age of 9.4 (SD=1.6) years and are all taking medicine these days. Before experiments, their parents' consents were obtained by providing a full explanation of the experimental procedures. All experimental procedures were performed under the provisions of our Institutional Review Committee.

The oxygen supply equipment (F501S, OXUS Co., Korea) that provides 21% or 92% oxygen in the air at a constant rate of 5L/min was used for this study. In order to maintain a steady flow and constant concentration, oxygen was administered to the subject through a mask. The subjects were not informed about the level of oxygen concentration.

Two subsets of simple visual matching tasks with similar difficulties were developed. This task was self-developed simple visual matching task, which is similar to the visual matching task for the effect of hyperoxic gas (5) and based on other tasks for simple visuospatial cognition studies (3, 14, 15, 16, 17). Each subset consisted of 24 items. As shown in Figure 1, each item involved a simple cognitive task in which an identical figure on the left was selected from four examples.

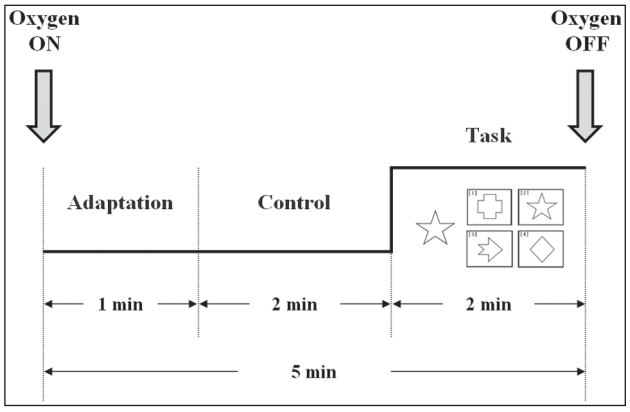

Figure 1. Experimental procedure.

The experiment consisted of two runs of the simple visual matching task, one with 21% oxygen and the other with 92% oxygen level. Each subject was instructed to complete two runs and the order of administration of the two oxygen concentrations was counterbalanced. As shown in Figure 1, each run consisted of three phases, a total of 5 min with Adaptation phase (1 min.) after oxygen administration, Control phase (2 min.) that had a stabilization period before starting the simple visual matching task, and Task phase (2 min.) that performed simple visual matching task. During the simple visual matching task, 24 items were presented at 5 sec interval. The simple visual matching tasks were presented using E-prime (Psychology Software Tools Inc., USA). Items were presented on a monitor and the subjects were asked to press the response button via keyboard to correctly identify the number of the item presented on the monitor. The two simple visual matching tasks were counterbalanced across high and low oxygen levels. The second run was carried out 1 h after the first run.

The accuracy rate (number of correct answers/ total number × 100%) and the mean response time on the visual matching test for the participants under the different conditions (21% and 92% oxygen) were calculated. A paired t-test (PASW ver. 18.0) was used with the condition (oxygen administration level) as an independent variable to verify a significant difference in the accuracy rate and in the response time.

Blood oxygen saturation (SpO_2 (%)) was measured for all phases using a pulse oximeter (8600 Series, NONIN Medical Inc., USA) on the left index finger of the subject. The mean of SpO_2 for each subject were calculated for each phase. To investigate if there was any statistical difference under the two oxygen concentration conditions and between each phase for SpO_2, the repeated measures ANOVA (PASW ver. 18.0) was employed with conditions (21%, 92%) and phases (Control, Task) as independent variables. Since Adaptation phase was an adaptation period after oxygen supply, it was excluded in the analysis.

Results

The mean accuracy rate was 91.1 (SD=8.0) and 96.4 (SD=5.0) for 21% and 92% oxygen administration, respectively. The paired t-test showed a significant difference in the accuracy rate between the two experimental concentrations ($t=-2.48$, $df=15$, $p=0.026$), as shown in Figure 2(a). The mean response time was 1891.2 (SD=306.7) msec and 1980.7 (SD=485.8) msec for 21% and 92% oxygen administration, respectively. There were no significant differences between the two concentration levels ($t=-0.976$, $df=15$, $p>0.05$).

Figure 2(b) shows means of SpO_2 of each phase (Control, Task) under two different levels of oxygen administration (21%, 92%). As shown in Table 1,

the repeated measures ANOVA using condition and phase as independent variables showed a significant difference in conditions ($p<0.001$). The SpO_2 of 92% oxygen administration increased significantly, compared to that of 21% oxygen administration. However, there was no significant difference in phases and interaction effect between condition and phase.

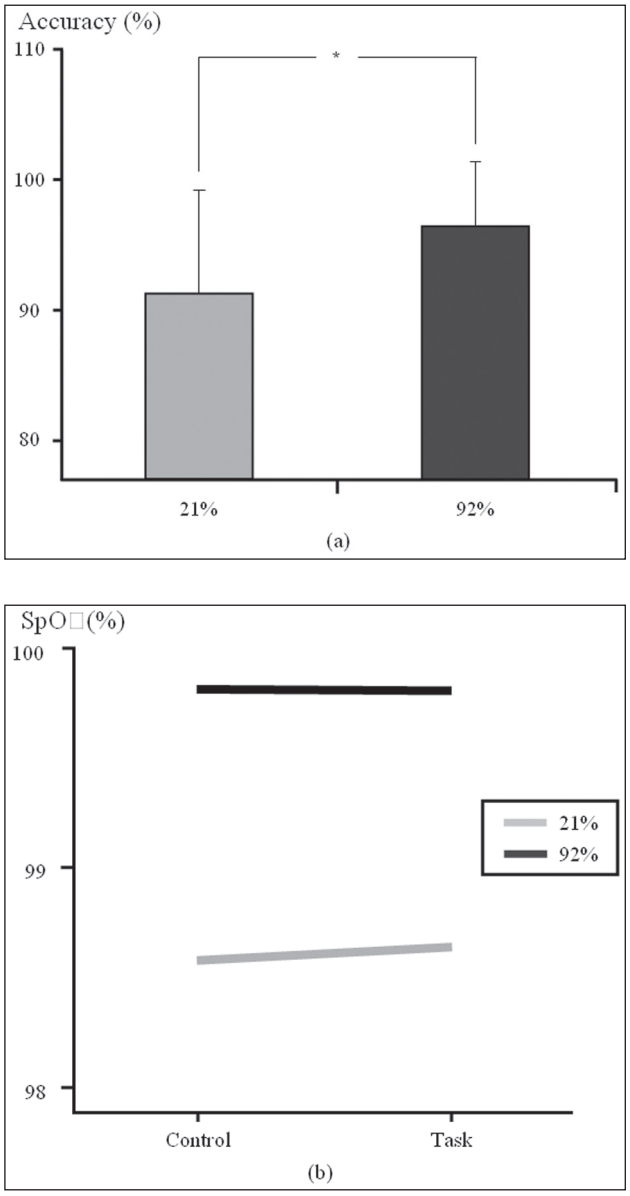

Figure 2. Change of (a) accuracy rate and (b) blood oxygen saturation (SPO_2) due to the amount of oxygen administration

Discussion

Several published studies have reported that the administration of highly concentrated oxygen compared to 21% oxygen administration increased blood oxygen saturation (SPO_2) and increased the performance ability (accuracy) of given tasks for healthy young adults (1, 2, 3 ,4, 6, 7, 8, 9). It was also reported that using functional Magnetic Resonance Imaging (fMRI) highly concentrated oxygen administration compared to 21% oxygen increased the amount of brain activation due to the increase of oxygen supply to the brain area which is closely related with cognitive processing, and from this there was an increase in cognitive ability (15, 18). From these findings it could be concluded that hyperoxic air increase oxygen saturation level in the blood, lead to more available oxygen to the brain, thus increase the ability of cognitive processing for healthy young adults.

In this study, the improvement of cognitive performance such as the increase of accuracy rate was observed for ADHD children with a high oxygen administration, which is consistent with the previous studies for healthy young adults (1, 2, 3, 4, 6, 7, 8, 9). This study also showed that for the ADHD children, same as the previous results for healthy young adults, hyperoxic air induced increase in SpO_2. As shown in previous studies (1, 2, 3, 4, 5, 6, 7, 8), increased SpO_2 by highly concentrated oxygen administration may have a positive effect in cognitive ability of ADHD children. It is well understood that an increase in fuel (e.g. glucose) supply leads to an upgrade in adenosine triphosphate (ATP) production at times of high demand. Its increased production may enable improvements to be made in information processing during the performance of cognitive tasks. In order to metabolise the fuel, the brain needs more oxygen. Such improvements would be manifest as cognitive enhancement (8). Therefore, we conclude that brain metabolism associated with cognitive processing becomes more pronounced, suggesting a need for a transient increase in the concentration of oxygen.

Table 1. Statistical analysis of blood oxygen saturation (SPO_2)

	Source	Type III Sum of Squares	df	Mean Square	F	Sig.
SpO_2	Condition	23.004	1	23.004	51.960	.000
	Phase	.005	1	.005	.086	.774
	Condition × Phase	.015	1	.015	.263	.615

In conclusion, this study provides the possibility that the supply of hyperoxic air can positively affect the cognitive performance of the ADHD children. A further study needs to be performed for effect of hyperoxic air on the cognitive processing of the ADHD children using a brain analysis based on fMRI. It is also necessary to study various cognitive abilities of the ADHD patients, such as memory and language.

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A study aimed at psycho-social factors which cause organizational stress and the methods of coping with stress among the workers in the healthcare sector

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Abstract

Objective of the Study: Organizational stress can emerge as a result of the quality of an organizational role depending on the quality of the responsibility, as well as on work and working environment, human relations in the workplace, organizational structure and atmosphere. In order to reduce the effects of organizational stress which arise depending on various causes, different ways of coping with stress is expressed. In our time it is seen that organizational stress is one of the serious problems faced in health sector.

Methodology: In this study it was intended to search the situations of confronting organizational stress, reasons for organizational stress and ways of coping with the stress of healthcare workers in a hospital selected in Zonguldak. In order to accomplish this aim, a questionaire related with organizational stress was used.

Results: The conclusion of the study reveal that 61.3% of the healthcare workers are in 21 – 38 year age group, 65.5% constituted by women, 34.5% are nurses, 55.7% said they incurred organizational stress. Concerning the methods for coping with stress it is envisaged that 59.3% of the healthcare workers relax by sharing their problems with the people they confide in, 53.1% occupied himself/herself with other things to get away from the cause which created stress, 51.0% tried to remain calm in spite of all are among the other findings.

Conclusion: By making some arrangements within the structure of the organization reducing the organizational stress is likely to be possible.

Key Words: Organizational stress, factors of organizational stress, ways of coping with stress, health sector.

Introduction

Organizational stress is characterized as a concept focused on intensely, especially recently and subject to a lot of researchs (1,2). At the present day, the rapid changes that take place in working life and technological advances result in the workers' confrontation with stress frequently (3). When studies about organizational stress are examined, stress is defined as a factor that causes the productivity and effectiveness of workers to drop as it influences both psychology and physiology of workers negatively (4, 2). As it is understood from the definition, the level of organizational stress is present in the matters concerning not only workers but also organizations (2).

When dealt with stress from the perspective of workers, it is seen that most of their time is spent in the working environment. Because of this, it is argued that the environment of the organization is effective on the stress levels of those who live in this medium and also their social relationships (4). Another conclusion drawn from this analysis is particularly in researches made in recent years, the workers confess that they have the opinion that they feel stressed in an increasing rate (5). Apart from these explanations, becoming aware of the gradual increase of the unwanted effects of organizational stress on the health and well-being conditions of the workers have also appealed to the studies made on the subject (4). Organizational stress, besides causing health problems to the workers also cause the productivity and performance of the workers to fall. Thus it reveals the importace of the true nature of the issue from organizational perspective more clearly (5). With the effects it has caused to come up, organizational stress level

concerns not only an issue of the individual but also takes placed among the issues that concerns the organization closely, it has lost the quality of being a problem that workers may solve alone (2).

When the studies are analysed, it is seen that organizational stress emerges depending on various factors (3, 6, 7). These can be lined up as stress factors sourced at work and working environment, organizational role, organizational structuring and atmosphere and human relations at work. Stress sourced from work and working environment are factors such as monotony of the work implemented, technological changes and suffering from adaptation problem, the ergonomic property of the working conditions (ventilation, noise and others) which is far from meeting the expectations and excessive work load. In prospect of the stress factors that come out from organizational role, not to have the chance to take part in organizational decisions, role conflict, communication problems, inconsistency between authority and responsibility rise to the foreground. In view of the methods developed to prevent stress, it is seen that there are organizational and individual methods of classification (3,7).

As a matter of fact, in the light of the organizational methods applied to fight against the organizational stress, a variety of methods such as taking precautions to ameliorate the atmosphere of the organization and working environment, avoiding over centralization, adaptation to enriching work, consultancy given on the subject of stress has to stand in the foreground (7). It is also focused on observing the changes by means of maintaining the working environment under control, eliminating the factors that will cause stress to workers, providing social support against stress, training on the subject of stress management, initiation to prevent work accidents and implimenting arrangements towards the ergonomic characteristics of the organization as the other methods used in coping with stress (8).

From the individualistic point of view to be able to fight against organizational stress, it is emphasized that before all else relaxing, positive and logical thinking characteristic must be attained (1, 7, 8). This view takes place among the ideas defended in contributing in solving the problems of the workers, and parallel to this stress will become lesser and lesser (1). It is observed that, when workers are confronted with incidents, they resort to changing their smoking, drinking, eating habits and display an intravert, passive (submissive) behaviour or over reaction to protect the psychological and social integrity. Apart from these, some relaxation techniques (massage, physical exercises, social activities etc.), arrangement of work by paying attention to time management, using effective communication methods are emphasized also to be influencial in reducing stress (8).

In the health industry, the workers face greater organizational stress than other industries due to the intense nature of the work such as caring for severe and fatal patients, the duty of moral support for the patients and their families. Furthermore, lack of resources at times effect the service provided and cause the uneven distribution of work; which altogether result in high stres levels and agitation among workers. The stress experienced at organizational level not only has negative effects on the worker's output and performance but also, brings forth questions on the status given to services in health industry. This may cause the stressed worker to reduce his or her performance, to be late to for work, to skip working days or quit compeletely. This situation results in losing experienced workers and further has negative effects on the worker's quality of life (9). There is an increasing number of research targetting these problematics, in particular within the health industry.

Therefore, this study aimed to determine the situations of healthcare workers who encounter organizational stress, the reasons for organizational stress and the ways to cope with the stress.

Methods

This research aims to investigate and determine the situations in which health workers face organizational stress, the reasons for the stress and their methods of coping with it. The research deals with all administrative and health workers (n=259) of a public hospital in the city of Zonguldak. The data collection begins shortly after the workers were informed of the research and necessary permission was obtained. The research took place between April and May 2010 with 205 questionnaires returned. Among the questionaires 11 were not included due to incomplete information. The percentage of retur-

ned questionaires is 75.0%. Following research on existing literature, the survey is used to determine the health industry workers' current situation in terms of organizational stress. The survey investigates the worker's social-demographic characteristics, the factors which they think, cause the organizational stress and their ways of coping with stress. A rating scale of 5 is used in the section of the survey which focuses on determining the factors that cause organizational stress, indicating (5) as the very often, (4) as often, (3) as sometimes,(2) as rarely and (1) as very rare. In this section of the survey, a high number result indicates a negative evaluation and a low number indicates a positive evaluation on the part of the workers. SPSS 13.0 statistics software was used in analising the data obtained from the survey. The analysis made use of defining statistics such as frequency and percentages. The findings reached through the analysis are presented in a table and commented upon.

Results

Table 1 reveals that 61.3% of the workers represent the 21-38 age group, 65.5% were female, 68.0% were married, 36.6% had vocational school level education, 34.5% were nurses, 54.6% had worked in the industry ≤1-14 years, 68.6% had worked in their related jobs ≤1-11 years, 55.2% worked 45 hours or more per week, 70.1% had an income of 1001-2000 TL per month, 55.7% did experience organizational stress at work and 35.1% evaluated the organizational stress they experience.

Table 2 reveals hospital workers' views on stress factors affecting their job and working environment. 29.4% of workers evaluated low income or salary, 35.5% long working hours, 26.8% risks related to the job and health issues, had 'high' effect on organizational stress. Some 31.4% evaluated lack of equipment and tools, 33.0% monotony of tasks, 26.3% heating and illumination problems, 28.9% difficulty in relationships, 27.8% responsibility of meeting deadlines, 33.5% hectic job condition and 22.2% lack of staff rooms, had 'moderate' effect on organizational stress. Hospital workers' 28.4% evaluated crowded and noisy working environment had low effect, whereas 33.0% evaluated frequent changes in shifts had 'very low effect' on organizational stress.

Table 1. Distribution of Workers in Relation to Individual Characteristics

Variables	Number	%
Age		
21-38 age group	119	61.3
39-62 age group	75	38.7
Sex		
Female	127	65.5
Male	67	34.5
Marital Status		
Married	132	68.0
Single	62	32.0
Education Level		
Primary school	9	4.7
High school	67	34.5
Vocational school	71	36.6
Undergraduate	34	17.5
Postgraduate	13	6.7
Job		
Doctor	13	6.7
Nurse	67	34.5
Administrative staff	31	16.0
Other health worker	51	26.3
Supporting service staff	32	16.5
Total Working Period		
≤1-14 years	106	54.6
15-37 years	88	45.4
Total Working Period in the Job Related		
≤1-11years	133	68.6
12-28 years	61	31.4
Weekly Working Hours		
40 hours	87	44.8
45 hours and more	107	55.2
Monthly Income (TL/ Turkish Lira)		
501-1000 TL	42	21.6
1001-2000 TL	136	70.1
2001-3000 TL	5	2.6
3001-6000 TL	11	5.6
The Individual's Organizational Stress Situation in Working Environment		
Yes	108	55.7
No	20	10.3
Sometimes	66	34.0
Organizational Stress Level		
Very often	24	12.4
Often	25	12.9
Sometimes	68	35.1
Rarely	51	26.3
Very rare	26	13.4
Total	**194**	**100.0**

Table 2. Distribution in Relation to the Effect of Factors Causing Stress at Work and the Working Environment (n=194)

Factors	Number	%
Lack of Necessary Equipment and Tools		
Very high	18	9.3
High	38	19.6
Moderate	61	31.4
Low	47	24.2
Very low	30	15.5
Income or Salary		
Very high	53	27.3
High	57	29.4
Moderate	35	18.0
Low	30	15.5
Very low	19	9.8
Long Working Hours		
Very high	29	14.9
High	44	22.7
Moderate	65	33.5
Low	31	16.0
Very low	25	12.9
The Monotony of Tasks		
Very high	14	7.2
High	42	21.6
Moderate	64	33.0
Low	44	22.7
Very low	30	15.5
Noisy and Crowded Working Environment		
Very high	34	17.5
High	36	18.6
Moderate	48	24.7
Low	55	28.4
Very low	21	10.8
Poor Heating and Lighting Conditions in the Working Environment		
Very high	21	10.8
High	28	14.4
Moderate	51	26.3
Low	43	22.2
Very low	51	26.3
Frequent Changes in Shifts		
Very high	8	4.1
High	32	16.5
Moderate	38	19.6
Low	52	26.8
Very low	64	33.0
Difficulty in Relationships		
Very high	27	13.9
High	49	25.3
Moderate	56	28.9
Low	37	19.1
Very low	25	12.9
Responsibility of Meeting Deadlines		
Very high	15	7.7
High	42	21.6
Moderate	54	27.8
Low	44	22.7
Very low	39	20.1
Hectic Job		
Very high	30	15.5
High	52	26.8
Moderate	65	33.5
Low	32	16.5
Very low	15	7.7
Risks Related to the Job and Health Issues		
Very high	47	24.2
High	52	26.8
Moderate	45	23.2
Low	26	13.4
Very low	24	12.4
Lack of Staff Rooms for Breaks		
Very high	36	18.6
High	33	17.0
Moderate	43	22.2
Low	42	21.6
Very low	40	20.6
Total	**194**	**100.0**

Table 3 reveals hospital workers' views on stress factors caused by colleague relationships. 27.8% of workers evaluated not being appreciated by line manager and 28.4% evaluated gossip in the workplace, as a 'very high' effect on stress. 30.9% evaluated not receiving personal support from colleagues, 24.2% evaluated competition and promotion ambitions and 37.6% evaluated obligation to follow rules established by colleagues, as a 'moderate' effect on stress.

Table 4 reveals workers' views on stress caused by organizational roles. 26.8% evaluated that organizational goals and politics not being met has 'high' effect on stress, whereas, 35.6% expressed the intensity of responsibilities, 27.8% expressed unequal distribution of tasks and responsibilities and 26.3% expressed the possibility of making mistakes, having a 'moderate' effect. 27.3% evaluated not working in the field trained for had low effect

and 28.4% evaluated not being informed of tasks outside the field and being exempted, had very low effect on stress in relation to organizational roles.

Table 3. Distribution in Relation to the Effect of Factors in Colleague Relationships that Cause Stress in the Job (n=194)

Factors	Number	%
Line Manager not Appreciating the Work		
Very high	54	27.8
High	48	24.7
Moderate	49	25.3
Low	21	10.8
Very low	22	11.3
Lack of Personal Support from Colleagues		
Very high	17	8.8
High	43	22.2
Moderate	60	30.9
Low	47	24.2
Very low	27	13.9
Gossip in the Work Place		
Very high	55	28.4
High	51	26.3
Moderate	41	21.1
Low	25	12.9
Very low	22	11.3
Competition Among Workers and Problems Related to Promotion Ambitions		
Very high	21	10.8
High	39	20.1
Moderate	47	24.2
Low	42	21.6
Very low	45	23.2
Being Obliged to Follow Rules Established by Colleagues		
Very high	16	8.2
High	27	13.9
Moderate	73	37.6
Low	43	22.2
Very low	35	18.0
Total	**194**	**100.0**

Table 5 reveals the workers' views on stress caused by organizational structure and environment. 32.0% of the workers evaluated disagreeing with the executive team, 29.4% evaluated not being able to be part of decisions and 26.3% evaluated not being able to criticize executive practices, had a 'high' effect on stress. 27.8% evaluated working in an unstable environment, 25.8% not being supported by executive team while making decisions, 33.0% evaluated intense surveillance, 34.0% evaluated excessive disciplines and imposition and control and 32.0% evaluated obligation of making important decisions, had 'moderate' effect. 26.3% evaluated sensing opposition while performing tasks, had 'low' effect on stress caused by organizational structure and environment.

Table 4. Distribution of Workers' Views on Stress Caused by Organizational Roles (n=194)

Factors	Number	%
Responsibilities of Tasks and their Intensity		
Very high	22	11.3
High	46	23.7
Moderate	69	35.6
Low	33	17.0
Very low	24	12.4
Unequal Distribution of Tasks and Responsibilities		
Very high	50	25.8
High	51	26.3
Moderate	54	27.8
Low	27	13.9
Very low	12	6.2
Possibility of Making Mistakes		
Very high	25	12.9
High	34	17.5
Moderate	51	26.3
Low	50	25.8
Very low	34	17.5
Working Outside the Field Trained for		
Very high	20	10.3
High	27	13.9
Moderate	46	23.7
Low	53	27.3
Very low	48	24.7
Sensing that Organizational Goals and Politics are not Met		
Very high	24	12.4
High	52	26.8
Moderate	51	26.3
Low	40	20.6
Very low	27	13.9
Not being Informed of Tasks Outside the Field, Exemption		
Very high	11	5.7
High	34	17.5
Moderate	40	20.6
Low	54	27.8
Very low	55	28.4
Total	**194**	**100.0**

Table 5. Distribution of the Workers' Views on Stress Caused by Organizational Structure and Environment (n=194)

Factors	Number	%
Working in an Unstable Working Environment		
Very high	23	11.9
High	44	22.7
Moderate	54	27.8
Low	41	21.1
Very low	32	16.5
Disagreeing with the Executive Team		
Very high	24	12.4
High	62	32.0
Moderate	36	18.6
Low	40	20.6
Very low	32	16.5
Not getting Support from Executive Team in Decision Making		
Very high	32	16.5
High	46	23.7
Moderate	50	25.8
Low	39	20.1
Very low	27	13.9
Not being Part of Decisions		
Very high	24	12.4
High	57	29.4
Moderate	45	23.2
Low	41	21.1
Very low	27	13.9
Intense Surveillance and Control		
Very high	8	4.1
High	29	14.9
Moderate	64	33.0
Low	56	28.9
Very low	37	19.1
Excessive Discipline and Imposition		
Very high	9	4.6
High	19	9.8
Moderate	66	34.0
Low	57	29.4
Very low	43	22.2
Obligation to make Important Decisions		
Very high	15	7.7
High	32	16.5
Moderate	62	32.0
Low	50	25.8
High low	35	18.0
Sensing Opposition While Performing Tasks		
Very high	11	5.7
High	43	22.2
Moderate	41	21.1
Low	51	26.3
High low	48	24.7
Not being able to Criticise Executive Practices		
Very high	32	16.5
High	51	26.3
Moderate	48	24.7
Low	37	19.1
Very low	26	13.4
Total	**194**	**100.0**

Table 6 reveals that workers cope with stress in a variety of methods. 59.3% discussed problems with colleagues, 53.1% occupied themselves with other tasks to escape the problem, 51.0% tried to stay calm despite all, 41.8% insisted on solving the problem, 39.7% tried to undermine the problem causing stress, 34.5% talked to the individuals who cause the problem to try and solve the situation for the better. In addition, the following findings were; (in decreased percentage) 'I evaluate my own role in the problem that causes stress' (34.0%), 'I console myself by praying and worshipping' (26.3%), 'I take on activities that relaxes me (such as painting, music etc.)' (24.2%), 'I exercise' (20.1%), 'I sleep more at times of stress' (16.5%), 'I increase smoking and alchohol intake' (14.4%), 'I take support from a professional' (13.9%), 'I eat more' (13.4%), 'I choose to accept the situation as it is' (11.9%), 'I take a vacation to stay away from the workplace' (10.8%). In addition, 4.1% of workers who contributed to the research, express that neutral approaches and equal distance from other workers might have a positive effect on organizational stress.

Discussion

As a conclusion, 33.0% of the workers indicated that the work was monotonous, 31.4% equipment was inadequate, 27.8% no appreciation by the employers, 30.9% not receiving personal support from the colleagues, 27.8% uneven distribution of duty and authority, 29.4% not being able to take part in decision making, 34.0% extreme dicipline and pressure, 33.5% intense work load and 33.5% long working hours were among the factors that they think cause organizational stress. The foremost method of coping with stre-

Table 6. Distribution of Workers' Views on Methods of Coping with Stress

Factors	Number*	%
I discuss problems with colleagues that I trust	115	59.3
I occupy myself with other tasks to escape the problem causing stress	103	53.1
I try to stay calm dispite all.	99	51.0
Having faith in a solution for the problem, I insist on solving the cause of stress	81	41.8
I try to undermine the problem causing the stress	77	39.7
I talk to the individuals who cause the problem to try and solve the situation for better	67	34.5
I evaluate my own role in the problem that causes stress	66	34.0
I console myself with prayer and worship	51	26.3
I take on activities that relaxes me (such as painting, music etc.)	47	24.2
I exercise	39	20.1
I sleep more in times of stress	32	16.5
I increase smoking and alcohol intake.	28	14.4
I take support from a professional	27	13.9
I eat more	26	13.4
I choose to accept the situation as it is	23	11.9
I take a vacation to stay away from the workplace	21	10.8

** Health Workers replied more than once*

ss emphasised was 'I try to relax by sharing my problems with people I confide in' (59.3%). This is followed by findings such as; 'I try to get involved in other work' (53.1%) and 'I try to stay calm despite everything' (51.0%). In a survey made on 300 healthcare workers by Okutan and Tengilimoglu (7), 48.0% revealed that the activity of work implemented influenced them and their health negatively, and also emphasized that factors such as lack of equipment and tools, heavy work load, responsibility of meeting deadlines, shortage of promotion aspirations etc. cause stress. On the other hand, the methods of managing stress are staying back until the distressed conditions disappear, trying to give the best decission possible, avoiding revealing their stress and trying to decide by consulting the family and friends.

According to a study made by Aydin (3) on service sector it is indicated that inefficient salary and wage, the structure of work and extreme work load, irregular working hours were among the reasons of organizational stress. Hence in the literature findings such as heavy work load, employing the worker in unsuitable jobs, lack of communication, uneven functioning of the feedback mechanizm and so forth which gives rise to stess also exist (4).

When the examples related to organizational stress in the health sector are analysed, it is seen that findings about the sources of stress for hospital managers and methods of their managing stress is formed around authority and duty, over work load and deadline pressure, supervision and coordination problems, personnel behaviour, relations with colleagues and the monotony of the job. It is emphasized that improving the working conditions, accomplishing positive dialogues between the workers, empowering authority, achieving planned implimentation of the activities by adopting time management, constitute the ways of managing stress (10).

In another survey accomplished by Sunter et al. (9) it is noted that the inadequate working conditions of village/neighbourhood clinics with respect to quantity and quality increases the stress of the healthcare workers and it is expressed that it is possible to solve this problem by taking some precautions. According to the survey of Işikhan et al. (11) on healthcare workers the work stress points of the medical doctors and nurses show high levels. The survey drives attention to lack of appreciation for the healthcare workers, the unjust criteria of promotion, the inconsistency of duty and authority, conflicts, ambiguity of roles, long and tiresome working hours, shortage of equipment as factors that cause stress.

Working effective and productive in health sector, achieving health services as an expected consequences and raising the satisfaction level of both the ones who offer healthcare services and

those who receive the health services depend on eliminating of the factors that cause stress in health sector which result from either individual or organizational factors. On this account, it is thought that some precautions taken directed to putting an end to organizational stress will have positive outcomes. Therefore:

- Contributive administrative structure must be adopted and workers' opinions must be taken into consideration by the leading manager,
- Opportunity must be given for the problems to be settled in due course by achieving an effective communication within the organization,
- The motivation of the workers must be upgraded by means of improving the working environment,
- Care must be given to the even distribution of the work load and by clarifying terms of duties, the tension which ambiguity of roles gives rise to is to be reduced,
- Workers must be informed about stress and ways of dealing with stress, programs which improve health must be arranged and social support must be provided,
- Care must be given to bring about the positive organizational atmosphere and extreme centralized structure and unnecessary control must be avoided.

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Role of glycated hemoglobin in the care of diabetes mellitus

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Abstract

Introduction: Persistently high glycemic levels are extremely harmful to the organism and can lead patients to several complications of diabetes mellitus. Glycated hemoglobin represents the glycemic levels for what patient is chronically exposed.

Methods: Two virtual databases were surveyed in two languages: Portuguese and English. 12 articles were selected and reviewed.

Results and discussion: The HbA1c is used since 1958 in the assessment of glycemic control in diabetic patients. It is formed by a chemical reaction between hemoglobin A and acarbohydrate. Each percentage point of glycated hemoglobin represents approximately 35mg/dL in patient's averageglycemia.

Conclusion: The glycated hemoglobin should be measured at least twice per year in patients with diabetes in general. In case of change of hypoglycemic therapy, this frequency should be doubled.

Key words: glycated hemoglobin, diabetes mellitus, complications, glycemia.

Introduction

Since the middle of last century, the mortality profile of the world population has suffered progressive changes. A major reason is the rise of chronic and degenerative diseases in relation to infectocontagious. Diabetes mellitus and its complications figure prominently among these potentially incapacitating or lethal injuries.

Diabetes is a multifactorial disease, resulting from the interaction of environmental and genetic factors. It is characterized by persistent hyperglycemia, which is caused by insufficient secretion or inadequateperipheral action of insulin. The medium and long term complications of diabetes mellitus can be very harmful, like microvascular, macrovascular and neuropathic pathologies, which can lead the patient to renal failure, vision problems, amputations, myocardial infarctions and cerebrovascular events[1].

Type 2 diabetes had an estimated prevalence of 3.3% of the Brazilian population in 1998. Ten years later, in 2008, this rate was 5.3%, reflecting the current epidemic of obesity, the unhealthy life habits and the wider access to diagnostic testing[2]. In Brazil, diabetes, including its typical complications,is one of the 10 leading causes of death and fifth most frequent reasons for hospitalization[3].

In medical literature there is a consensus to say that persistently high levels of glucose in the blood of patients with diabetes mellitus are extremely harmful to the organism[1,2,4]. It is this lack of glycemic control that results in the complications already mentioned. In individuals with diabetes mellitus, glycated hemoglobin is a good parameter for monitoring the rates of blood glucose to which the patient is chronically exposed, which may be representative of a greater propensity to develop classic complications of this disease[2].

The objective of this study is to collect information from specialized literature about the glycated hemoglobin, its diagnostic significance and its role in the follow-up of diabetic patients, including the assessment of disease complications.

Methods

This article results from a literature review performed between March and April 2012. We searched two databases: SciELO (Scientific Electronic Library Online) and Medline. For the final composition of the manuscript, were also used reference books about biochemistry and laboratory medicine.

The medical databases were searched from 28 to 30 March 2012, with the descriptors "glycated hemoglobin", "glycosylated hemoglobin", "glycohemoglobin", "glycemic control" and "complications of diabetes mellitus", in addition to their

corresponding terms in Portuguese. As results, the search returned a total of 41 articles, of which only 12 were selected for final review.

Results and discussion

The glycated hemoglobin, glycosylated hemoglobin or HbA1c has been used since 1958 as a parameter for assessment of glycemic control in diabetic patients[3]. These terms refer to a group of substances formed from the chemical reaction established between the hemoglobin and a carbohydrate.

Using this tool became even more accepted and widespread since 1993, when they were released two important clinical studies about the impact of glycemic control in the establishment of chronic complications of diabetes mellitus[5]. The Diabetes Control and Complications Trial (DCCT), in 1993, and United Kingdom Prospective Diabetes Study (UKPDS), in 1998, demonstrated that maintaining the glycated hemoglobin levels below 7% leads to a significant reduction in the risk of typical complications of this disease[6].

The diabetic patient must follow therapeutic targets, which vary according to the guidelines consulted. With respect to the concentration of glycated hemoglobin in peripheral blood, the American Diabetes Association (ADA) indicates values lower than 7%, while the Brazilian Diabetes Society (SBD) suggests an index below 6.5%[2].

The A1c fraction of glycated hemoglobin, routinely required in the laboratory evaluation of patients with diabetes, represents a glucose residue bounded to the terminal amino group (valine residue) of one or both of the hemoglobin A beta chains[7]. This bound between glucose and HbA results from a reaction not mediated by enzymes called glycation. According to the standardized nomenclature of chemical compounds, the correct designation of this compound is glycated hemoglobin, rather than glycosilated hemoglobin, as commonly used[8].

The membrane of erythrocytes is very permeable to glucose, what allows the hemoglobin inside to be in contact with a sugar concentration very close to that observed in plasma. The glycation of hemoglobin chains occur in proportion to blood glucose. We can therefore say that the concentration of glycated hemoglobin depends on the rate of glucose medium and the half-life of red blood cells[5]. Thus, considering a half-life of red blood cells about 120 days, the evaluation of the glycated hemoglobin levels can provide an estimate of average blood glucose levels for a period of 60 to 90 days before the laboratory examination[9].

The most used method to measure the concentration of glycated hemoglobin is the high performance liquid chromatography (HPLC)[10]. According to this method, the reference values for non-diabetic individuals are between 4% and 6%. However, high levels of HbA1c do not represent the diagnosis of diabetes mellitus, but high average glycemic levels.

We can roughly estimate, based on glycated hemoglobin levels, the average blood glucose of the patient within the validity period of the examination. According to the study Diabetes Control and Complications Trial (DCCT), each percentual point of glycated hemoglobin represents about 35mg/dL in blood glucose levels, for the average patient[11]. The result of this estimation is recorded in Table 1.

Table 1. Average glycemia and correspondent glycated hemoglobin levels

PeripheralHbA1c levels	Average 120-days glycemia
4%	65 mg/dL
5%	100 mg/dL
6%	135 mg/dL
7%	170 mg/dL
8%	205 mg/dL
9%	240 mg/dL
10%	275 mg/dL
11%	310 mg/dL
12%	345 mg/dL

However, for an authoritative interpretation, it must be taken into account that the average blood glucose of the most recent period influences more strongly the levels of glycated hemoglobin. Therefore, it is considered that half of the value of A1c corresponds to the 30 days preceding the examination, 25% to the previous month and the remaining 25%, to two months earlier[12], as shown in Table 2.

Table 2. Estimated chronological distribution of glycated hemoglobin

Pre-test period	Representative fraction
30 days	50%
60-30 days	25%
120-60 days	25%

Conclusion

The glycated hemoglobin test is the most widely accepted for monitoring long-term average glycemia, as well as to evaluate the risk of chronic complications of diabetes mellitus. In adults, it is considered that A1c levels above 7% represent a higher risk for such problems. Measurement of hemoglobin A1c should be performed at least twice per year in patients with diabetes in general. In case of changes in the hypoglycemic therapy, this frequency should be doubled.

Like the laboratory parameters in general, the reference values for glycated hemoglobin vary widely according to the methodology of the measurement. The associations of laboratory medicine have, however, made efforts in order to adopt a standardization of such methods.

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Nutritional behaviors in pre-diabetic patients and differences in stages of change" decisional balance" self-efficacy and process of change based on trans-theoretical model in Yazd-Iran

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Abstract

Objective *(Background):* Impaired fasting glucose (IFG) and Impaired glucose tolerance (IGT) are considered to constitute "pre-diabetes."[1] and are now recognized as pre-diabetes states. [2] which is characterized by elevated blood glucose levels with either fasting plasma glucose between 100 and 125.[3] Pre-diabetes prevalence varied by age, sex, and race/ethnicity, and there was considerable discordance between measures of pre-diabetes.[4] Subjects with IFG/IGT have an increased risk of developing diabetes and a higher prevalence of cardiovascular disease than normoglycemic individuals.[5] Men and women with pre-diabetes were significantly older; had significantly higher BMI.[6]Research suggests that PD is associated with an increased risk of developing diabetes.[3] Obesity-associated diabetes in adolescents is increasing throughout the world.[7] The Stages of Change Model has been used in interventions as a way of assessing and measuring participants' readiness for change. [8] Therefore, pre-diabetes is a condition in which primary prevention efforts through lifestyle modification are particularly important.[9]This study identifies pre-diabetes related characteristics of individuals at different stages of readiness to change to healthy eating. The objective of the current study is to determine nutritional behaviors of Pre-Diabetic persons based on Trans-theoretical model and relationships between nutrition behaviors and BMI among a population of Pre-diabetes adults in Yazd - Iran. Achieving glycemic control in patients with pre-diabetes through lifestyle and pharmacologic interventions can effectively prevent or delay the development of diabetes and its associated complications. The first step, however, is to identify patients at risk.

Research design and methods: Stage based differences in demographic, eating related, health care utilization, were examined in a sample of 220 pre-diabetic individuals aged thirty and above from health centers Yazd City. Validity of questionnaires was assessed by face & content method. Test retest and internal consistency methods were used for reliability of stages of change questionnaire and for nutritional knowledge scale respectively. The internal consistency of knowledge scale was high (Cronbach alpha= .73). Data was analyzed using SPSS17 using central indexes tests. We used fasting plasma glucose test to assess the IFG and pre-diabetes and used the Trans-theoretical Model (TTM) to estimate the nutritional behaviors. The TTM has recently provided insight into dietary changes regarding reducing fat, increasing fiber and losing weight. Participants completed validated questionnaires to assess the constructs of the TTM. This assessed where the patient was in the stage of change cycle, motivation to nutritional behaviors, how easy they thought this would be and attendance rate. Inclusions criteria were ability to read and understand Persian. A 5-point Likert scale was used; 1 being not at all confident and 5 being very confident.

Results: For pre-diabetic participants, sex, percent calories from fat, carbohydrate and protein differed across stages. Those in Pre-action stages were more likely than action and Social support was highest for those in the contemplation stage and lowest for those in the action stage. The majority of participants were in the Pre-action stages.

Conclusions: These data validate the Trans-theoretical Model, where those in the action stages displayed healthier eating. Pre-contemplators and contemplators were a heterogeneous group and may need individually tailored interventions. Nutritional Behavior is important in preventing diabetes. It is, therefore, important at all levels of diabetes prevention.

Key words: Stages of Change Model, Trans-theoretical Model, Nutrition, Pre-diabetes

Background

Pre-diabetes broadly refers to an intermediate stage between completely normal glucose levels and the clinical entity of type 2 diabetes, encompassing both IFG and impaired glucose tolerance (IGT). As defined by the American Diabetes Association (ADA), pre-diabetes is a FPG of at least 100 mg/dl but less than 126 mg/dl, which is frequently termed IFG.[10] The progression from pre-diabetes to type 2 diabetes occurs over many years, strong evidence to support intervention to delay the progression from pre-diabetes to diabetes.[10] By definition, pre-diabetes is a condition where one has fasting blood sugar levels above normal (blood sugar between 100-125 mg/dl) but the blood sugar levels are not high enough to diagnose diabetes (fasting blood sugar above 126 mg/dl). recognition of pre-diabetes is important to identify individuals who have risks that can be modified to improve outcomes.[11] Pre-diabetes was highly prevalent among adults.

The macronutrient composition and the caloric content of our diet are major determinants of glucose homeostasis and there is a continuously growing list of foods, nutrients or individual compounds that have been associated with an increased or reduced incidence of diabetes mellitus. These include fat, carbohydrates, fiber and other micronutrients or individual dietary compounds, which have been shown to either promote or prevent a progression towards a Pre-diabetes.

The trans-theoretical model of behavior change the 'Stages of Change' by Prochaska & Di Clemente (1982) has become one of the most influential theoretical models within health psychology. The model proposes that people move through 5 stages of "readiness to change" (the Stages of Change), as they adopt a new behavior.[12] Characterized by treating behavior change as a dynamic process, it has recently been applied to diabetes mellitus.[13] Prochaska *et al*. TTM is the most widely used stages of behavior change theory in the field of health promotion. The model has been successfully applied to a variety of health-related behaviors, including smoking, physical activity and nutrition habits.[14]The evidence for using stage-based interventions is rated as suggestive in the areas of fruit and vegetable consumption and dietary fat reduction. Valid and reliable staging algorithms are available for fruit and vegetable consumption and dietary fat intake, and are being developed for other dietary behaviors. Few assessment tools have been developed for other TTM constructs.[15] Basic research has generated a rule of thumb for at-risk populations: 40% in precontemplation, 40% in contemplation, and 20% in preparation. Across 12 health behaviors, consistent patterns have been found between the pros and cons of changing and the stages of change.[16] Systematic reviews in this field show how the TTM has been widely applied to multiple health-change behaviors, such as substance abuse, diabetes mellitus, or exercise. However, more recently, there has been growing interest in applying the TTM to weight management in overweight and obese patients.[17]The trans-theoretical model is useful for understanding the decision-making process involved in dietary behavior change.[18]

Core constructs

The model is composed of four constructs: (1) *stages of change,* the temporal readiness to modify health behavior; (2) *decisional balance,* the relative importance of the perceived pros and cons of change; (3) *situational, self-efficacy,* confidence in one's ability to modify behavior across positive social, negative effect, and difficult situations; and (4) *processes of change,* the experiential and behavioral strategies individuals use to progress through the stages of change.[19]According to the TTM, health behavior change involves progression through five stages: (1) pre-contemplation, no intention of changing behavior in the foreseeable future (defined as the next 6 months); (2) contemplation, intending to change within the next 6 months; (3) preparation, intending to change within the imme-

diate future (defined as the next month); (4) action, behavior change has been made within the past 6 months; and (5) maintenance, changes have been made and sustained for 6 months or longer.[19] Each stage of change tends to be characterized by the use of specific processes. Experiential strategies are used most frequently by individuals in the contemplation and preparation stages of change. Behavioral processes are used most frequently by individuals in the action and maintenance stages. This model is referred to as "Trans-theoretical" because it encompasses many theories of behavior change.[20] Stages of change lie at the heart of the TTM.[21] They are the common strategies or techniques, emerging from a comparative analysis of various psychotherapeutic approaches (Prochaska, 1979) that can be used to change behavior. For example, `consciousness raising', from the Freudian tradition, involves gaining an awareness or understanding of the problem, and `reinforcement management', from the Skinnerian tradition, involves increasing the rewards for the healthy behavior, and reducing the rewards for the unhealthy behavior. Other processes involve self-reappraisal, supportive relationships, and commitment. Research across a number of behaviors (including smoking, weight control, psychological distress, exercise, alcohol abuse) demonstrates that precontemplators infrequently use all processes, that use of those processes which involve gaining insight and understanding (experiential processes, or emotional or cognitive strategies) increases in contemplation and peaks in the preparation stage, while those in action and maintenance are more likely to use behavioral processes.[22]

Process of Change

Processes of change are the experiential and behavioral activities that people use to progress through the stages. It is important for all practitioners of population health to understand these progressions. Ten processes have received the most empirical support in our research to date.[21]

- *Consciousness Raising*- Consciousness raising involves increased awareness about the causes, Consequences, and cures for a particular problem behavior. [21]
- *Dramatic Relief* -Dramatic relief initially produces increased emotional experiences followed by reduced affect or anticipated relief if appropriate action is taken.[21]
- *Environmental Reevaluation* - Environmental reevaluation combines both affective and cognitive assessments of how the presence or absence of a personal habit affects one's social environment. It can also include the awareness that one can serve as a positive or negative role model for others. [21]
- *Self-Reevaluation* - Self-reevaluation combines both cognitive and affective assessments of one's self-image with and without a particular unhealthy habit.
- Self-reevaluation. During interaction with a patient, the provider might ask, "Imagine you were free from smoking. How would you feel about yourself?"[21]
- *Self-Liberation* -Self-liberation is both the belief that one can change and the commitment, as well as the recommitment, to act on that belief. Encouraging patients to make New Year's resolutions, public testimonies, or a contract are ways of enhancing willpower. The provider might say, "Telling others about your commitment to take action can strengthen your willpower. Who are you going to tell?"[21]
- *Social Liberation*- Social liberation requires an increase in social opportunities or alternatives, especially for patients who are relatively deprived or oppressed. [21]
- *Counter conditioning* -Counter conditioning requires learning healthy behaviors as substitutes for problem behaviors.[21]
- *Helping Relationships* - Helping relationships combine caring, trust, openness, and acceptance, as well as support for healthy behavior change. Rapport building, a therapeutic alliance, supportive calls, and buddy systems can be sources of social support that healthcare providers could offer. [21]
- *Reinforcement Management* - Reinforcement management provides consequences for taking steps in a positive direction. While contingency management can include the use of punishment, we found that self-changers rely on reward much more than punishment. So, we recommend that healthcare providers emphasize reinforce-

ment because a philosophy of the stage model is to work in harmony with how people change naturally.[21]

- *Stimulus Control* -Stimulus control removes cues for unhealthy habits and adds prompts for healthier alternatives. [21]

Decisional Balance

Decisional balance was a variable in the construct validity regression models. It reflects the perceived balance of benefits (pros) compared with costs (cons) of engaging in a behavior change along the SOC continuum. The pros have been demonstrated to increase progressively and the cons to decrease as the SOC moves toward action for a variety of health-related behaviors. Decisional balance was assessed by asking respondents how important each of the listed pros and cons(4 pros and 4 cons items) was in their decision to nutritional behaviors using five-point Likert scales ranging from -2 (*not at all important*) to 2 (*very important*).

Self-efficacy

According to Bandura, "perceived self-efficacy is defined as people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances. It is not concerned with the skills one has." Self-efficacy theory suggests that goals should be attainable in the near future, because immediate success can provide motivation and enhance efficacy. [23] Self-efficacy was assessed by asking respondents to rate on five-point Likert scales ranging from -2 (*very difficult*) to 2 (*very easy*), how difficult or easy they find it to eat according to the situations, for each of dietary behaviors.

The relevant model tenet for the instrument development reported here states that the concepts of SE, decisional balance, knowledge, and contextual factors are predictive of stage of change (SOC) and actual nutritional behaviors participation. The concepts of SE (confidence or temptation in the face of challenging circumstances), decisional balance (weighing pros and cons), and SOC (pre-contemplation, contemplation, preparation, action, and maintenance) are from the Trans-theoretical Model (TTM). Conceptually based models such as the TTM have demonstrated explanatory ability (40%-80%) for a variety of health behaviors. The SE concept is associated positively with mammography screening and other health-related behaviors (e.g., condom usage, contraceptive usage, drinking and driving, smoking cessation, and vegetable and fruit consumption).[24]

Self-efficacy (confidence to perform the new behavior) and decisional balance (relative importance of the perceived pros and cons of adopting the new behavior) constructs are shared by a number of continuum theories (e.g. social learning theory, theory of planned behavior, health belief model). The pros and cons of change are the individual's perceptions of the actual consequences of changing high-risk behaviors. In the TTM, self-efficacy is conceptualized not only as confidence in ability to change the risk behavior, but also as temptation to continue the risk behavior.[22]

Relationship between Stages and Process of Change

One of the earliest empirical integrations was the discovery of systematic relationships between the stages people were in and the processes they were applying. This discovery allowed an integration of processes from theories that were typically seen as incompatible and in conflict. For example, the Freudian theory relied almost entirely on consciousness raising for producing change. This theory was viewed as incompatible with Skinnerian theory that relied entirely on reinforcement management for modifying behavior. But self-changers did not know that these processes were theoretically incompatible and their behavior revealed that processes from very different theories needed to be emphasized at different stages of change. This integration suggests that, in early stages of population health management, efforts should support the application of cognitive, affective, and evaluative processes to progress through the stages. In later stages, these programs should rely more on commitments, conditioning, rewards, environmental controls, and support to progress toward maintenance or termination.[21]

The application of TTM in the diabetes context has been defended on the grounds that persons with diabetes who have been classified within the action or maintenance stages have been observed to display healthier eating patterns than those at other stages. [25]

The concept of pre-diabetes has been discussed since the 1950's. After 1980, WHO expert guidelines on the classification of diabetes according to its stages of development became common. These guidelines also included statistically significant risk groups with diabetes likely to develop in the future. The term Impaired Glucose Tolerance (IGT) was officially introduced by WHO in 1979, with an additional category referring to changes in glucose metabolism to be included later on--the Impaired Fasting Glucose - IFG. The term pre-diabetes mellitus began to be used again after 2000, and after 2003 diagnostic criteria to delimit diabetes and pre-diabetes came into use.[26]

Obesity is associated with an increased risk of developing insulin resistance and type 2 diabetes mellitus (T2DM). It is important to note the progressive nature of pre-diabetes and T2DM when obesity is not treated.[27] Knowledge of the risk factors and protective factors associated with type 2 diabetes is essential for the development of prevention strategies. Diet is thought to have an important influence on the development of diabetes. [28] Although diet and nutrition are widely believed to play an important part in the development of Type II (non-insulin-dependent) diabetes mellitus, specific dietary factors have not been clearly defined. Much controversy exists about the relations between the amount and types of dietary fat and carbohydrate and the risk of diabetes.[29]

Data analysis

Data was analyzed using SPSS version 17. Noar and Zimmerman suggested that contemplation/preparation stages might be comparable to positive behavioral intentions.[30] *T*-tests and chi-square tests were used to test for differences in demographic characteristics between all stages. Analysis of variance was conducted to determine differences across stage for each construct.

Measures

TTM measures for dietary behaviors were used. Participants were classified into one of the five stages of change for dietary behaviors using a validated staging algorithm. The construct of self-efficacy was assessed using a seven-item Likert scale of the temptation to eat foods across a variety of challenging situations. The two constructs of decisional balance were measured with a eight-item, five-point Likert scale that assessed the relative importance given to the pros and cons when making a decision whether to dietary behaviors. The processes of change were quantified using 60 items that assessed the frequency of process use. This scale included 10 constructs: (i) consciousness raising (CR) about unhealthful dietary behavior, (ii) dramatic relief (DR), using feelings to help motivate healthful dietary behavior; (iii) environmental reevaluation (ER), assessing the impact unhealthful dietary behavior has on others; (iv) self-reevaluation (SR), reassessing thoughts and feelings about oneself as a person with unhealthful dietary behavior; (v) social-liberation (SO), becoming aware of changes in the environment that influence dietary behavior patterns; (vi) self-liberation (SL), recognizing choices and making a commitment to healthful dietary behavior; (vii) helping relationships (HR), seeking and accepting support from others to healthful dietary behavior; (viii) reinforcement management (RM), rewarding oneself or being rewarded for healthful dietary behaviors; (ix) counter conditioning (CC), substituting other thoughts and healthful dietary behaviors in place of unhealthful ones, and (x) stimulus control (SC), avoiding situations, places or things that trigger excess consumption of foods .

BMI

Height and weight measurements were taken by trained research staff using standardized protocols. [31]adults wore light clothing and no shoes. Adults ' weights were measured to the nearest 0.1 kg using a digital scale and heights were measured to the nearest 0.1 cm using a free-standing portable stadiometer. Body mass index (BMI) was calculated as weight (kilograms) divided by height (meters) squared. Weight status (obese, overweight, and normal weight) was defined using international definitions for Adults.

Nutrition behaviors

The nutrition behaviors chosen for analyses were selected because of the available evidence in Yazd health centers, which indicates these behaviors as correlates of overweight, obesity and Pre-diabetes. *Daily consumption* was assessed with the question, participants were asked about their

usual daily *consumption* separately with the Food recall in the last 3 days and Food frequency, 'How many serves of food do you usually eat each day?' *Fast food/takeaway food consumption* was assessed with the question, 'How often do you usually eat food from a takeaway? Consumption of *snacks* that were high in fat or high in sugar was assessed with questions about the frequency of eating fried foods or chocolates, sweets, or ice cream and ets. *Soft drink consumption* was estimated with questions: 'In the last3 days (including time spent at home), on how many days did you have regular (non-diet) soft drinks?' and how many glasses or cans of soft drinks did you have? Average soft drink consumption was estimated by multiplying the number of days soft drinks were consumed by the previous day's consumption and then averaged over the previous 3 days.

A weight-control strategy might include: choosing low-fat, low-calorie foods, eating smaller portions, drinking water instead of sugary drinks, being physically active [32]

Results

In our sample, approximately (34.5%) was classified as pre-contemplators, (32.3%) as contemplators, (15.9%) in preparation, (7.3%) in action and (10%) in maintenance. (75%) of persons were female and (25%) male. (47.7%) were overweight, (32.3 %) Obesity grade 1, (8.6 %) Obesity grade 2, (0.9 %) Obesity grade3 and only (10.5%) were normal weight. (65.5 %) have primary education, (21.8 %) secondary and (12.7%) an academic degree. Decisional balance in 61.4% of participants was high and 12.3% was excellent. Self -efficacy in (31.4 %) of participants was high and (58.2%) was excellent. Process of change behavior in (o.9%) was low, (13.2%) average, (63.2%) high and (22.7%) was excellent . Examination of the nutritional correlates of BMI in our sample found inverse relationships between BMI and consumption of high-fat/high-sugar foods and positive relationships between BMI and eating 5 or more food a day. Patients aged 50–80 years had a lower rate than those aged 30–50 years. Overweight Patients had higher rate than those with normal weight. Adherence to the prescribed diet (<30% caloric intake from fat, ~55% from CHO, and ~15% from protein and <300 mg·d™1 cholesterol intake) was monitored with 3-day food records by a study dietician but in our study were 30-50% caloric intake from fat, 40-60% from CHO, and 10-15% from protein.(see Fig 1,2,3) Participants in action-maintenance stages evidenced higher pros, self-efficacy, and fruit and vegetable consumption and significantly lower cons than did, participants in pre-contemplation and contemplation-preparation stages. Also, participants in action-maintenance stages used processes of change more frequently than did those in pre-contemplation-contemplation-preparation stages. The use of experiential and behavioral processes within these stages did not differ significantly, as posited.

Dietary applications of the TTM have found individuals in action and maintenance stages to have higher self-efficacy than those in pre-action stages of change. An examination of the use of change processes across nine problem areas found that experiential processes were used more in the earlier stages (pre-contemplation through preparation), whereas behavioral processes were used more in later stages of change (action and maintenance).[19]

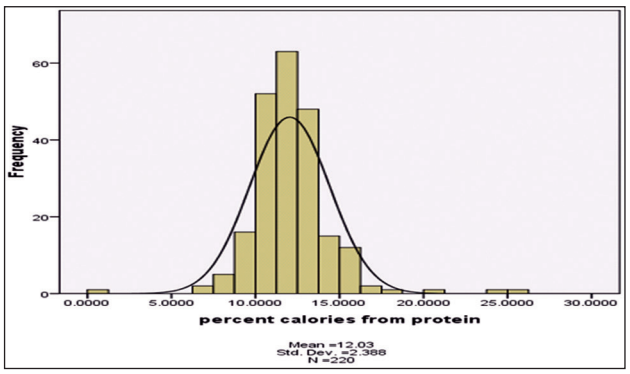
The measurement structure of decisional balance, relative magnitude of the pros and cons within stages, and shifts in the pros and cons across stages were consistent with theory. Across behaviors, the average increase in pros was greater than the average decrease in cons from pre-contemplation to action stages.[18]

Conclusion

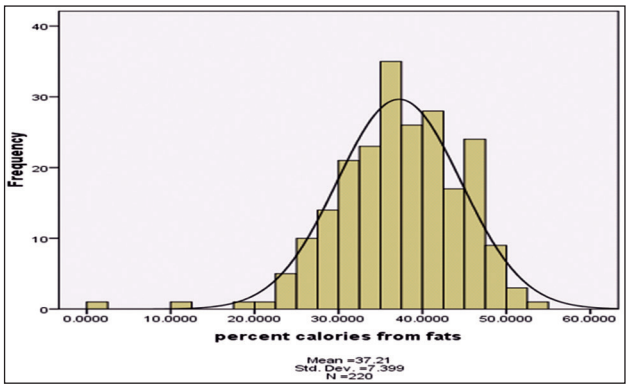
Evidence from this study would suggest that the stages of change model may help identify motivated patients if used as a questionnaire tool. Stage theories specify an ordered set of 'stages of readiness to change' into which people can be classified and identify the factors that can facilitate movement from one stage to the next. If eating behavior change follows a stage process, then nutritionists could identify the predominant stage or stages in a population and focus resources on those issues most likely to move people to the next stage (e.g. from no intention of changing, to thinking about changing). In addressing this question, the review draws on the defining characteristics of stage theories as clarified by Weinstein et al.

(1998), provides an in-depth coverage of methodological considerations, and a detailed summary table of dietary studies applying the TTM. Specific recommendations are made for improving the accuracy of dietary stage classifications.[33] Elements of the trans-theoretical model offer promise in developing effective health behavior change interventions.[34]. Differences across stage of change were found for nutritional behaviors, self-efficacy, pros of more nutritional behaviors and processes of change. Nutritional behaviors, self-efficacy and the pros of more healthy nutrition were greater in the maintenance than contemplation stage. Stage differences in processes were: consciousness raising (increased contemplation to action), self-liberation (increased contemplation to maintenance), helping relationships (increased preparation to maintenance), counter conditioning (increased contemplation to preparation, action and maintenance) and reinforcement management (increased contemplation and preparation to maintenance). Experiential processes were used more than behavioral processes in the preparation stage. The Trans-theoretical Model is a dynamic theory of change and it must remain open to modifications and enhancements as more students, scientists, and practitioners apply the stage paradigm to a growing number of diverse theoretical issues, public health problems, and at-risk populations.[21] The term "pre-diabetes" has recently been adopted internationally to describe many of these conditions, but no national or international management guidelines have been published.[35]

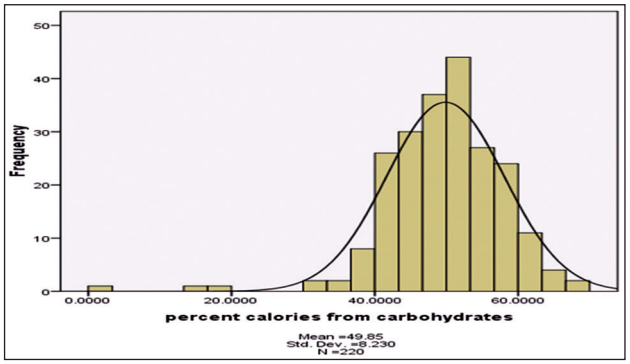
Little research has given consideration to how people's weight control behaviors may moderate the relationships between nutrition and body mass index (BMI) in large cross-sectional studies.[31] Studies from around the world have shown that dietary modification for the prevention of T2DM can be successful; however which dietary factors are important remains to be fully elucidated. Indeed there is now overwhelming evidence to conclude that lifestyle modification can prevent or delay the onset of T2DM.[36] It is widely accepted that obesity is the single most important risk factor for T2DM; being overweight, having abdominal fat distribution, and obesity account for around 90% of all T2DM cases. Guidelines emphasis the need to maintain a healthy weight (BMI <25 kg/m^2) or for those overweight to reduce weight to prevent T2DM.[36] The Diabetes UK 2011 guidelines place an emphasis on carbohydrate management and a more flexible approach to weight loss, unlike previous guidelines which were expressed in terms of recommendations for individual nutrient intakes.[37]Almost everyone who develops type 2 diabetes develops pre-diabetes first. But not everyone who has pre-diabetes -defined as having levels of glucose (a type of sugar in the blood) that are higher than normal but not yet diabetic - ends up with diabetes. In fact, changing your lifestyle can significantly delay or even prevent type 2 diabetes.[38]



Picture 1



Picture 2



Picture 3

Table 1. Stage of change (SOC), Process of Change Behavior (POCB), Decisional Balance (DB) and Self Efficacy (SE)

(SE) **Self Efficacy**	(DB) **Decisional Balance**	(POCB) **Process of Change Behavior**		**stage of change**(SOC)					**Total**
				1*	2**	3***	4****	5*****	
Low	excellent	POCB	low	1					1
		Total							1
Average	average	POCB	low	1	0				1
			average	1	1				2
			high	1	0				1
		Total							4
	high	POCB	average	3	0	0	1		4
			high	4	5	2	0		11
		Total							15
	excellent	POCB	average	1	1				2
			high	1	0				1
		Total							3
High	very low	POCB	excellent	1					1
		Total							1
	low	POCB	high					1	1
		Total							1
	average	POCB	average	1	0	0	0	0	1
			high	3	3	0	1	1	8
			excellent	0	0	1	0	0	1
		Total							10
	high	POCB	average	1	4	0	0	1	6
			high	18	11	7	2	1	39
			excellent	1	2	0	0	0	3
		Total							48
	excellent	POCB	high	4	1	0			5
			excellent	1	2	1			4
		Total							9
Excellent	average	POCB	average	3	1	0	0	1	5
			high	3	9	6	1	3	22
			excellent	5	4	4	2	0	15
		Total							42
	high	POCB	average	3	3	2	0	0	8
			high	12	10	5	6	8	41
			excellent	3	7	6	3	4	23
		Total							72
	excellent	POCB	average	0	1	0		0	1
			high	3	5	1		1	10
			excellent	1	1	0		1	3
		Total							14

**1= Pre contemplation **2=Contemplation ***3=Preparation ****4= Action *****5= Maintenance*

Table 2. Stage of change (SOC), sex, Decisional Balance (DB) and Self Efficacy(SE)

(DB) Decisional Balance	(SE) Self Efficacy	SOC stage of change		sex		Total
				male	female	
very low	high	stage of change	1*		1	1
		Total				1
low	high	stage of change	5* * ***		1	1
		Total				1
average	average	stage of change	1	2	1	3
			2**	0	1	1
		Total				4
	high	stage of change	1	1	3	4
			2	0	3	3
			3* * *	0	1	1
			4* * **	0	1	1
			5	0	1	1
		Total				10
	excellent	stage of change	1	2	9	11
			2	4	10	14
			3	3	7	10
			4	0	3	3
			5	1	3	4
		Total				42
high	average	stage of change	1	1	6	7
			2	1	4	5
			3	1	1	2
			4	1	0	1
		Total				15
	high	stage of change	1	5	15	20
			2	4	13	17
			3	1	6	7
			4	0	2	2
			5	1	1	2
		Total				48
	excellent	stage of change	1	3	15	18
			2	7	13	20
			3	3	10	13
			4	4	5	9
			5	3	9	12
		Total				72
excellent	low	stage of change	1		1	1
		Total			1	1
	average	stage of change	1	1	1	2
			2	0	1	1
		Total				3
	high	stage of change	1	1	4	5
			2	2	1	3
			3	0	1	1
		Total				9
	excellent	stage of change	1	0	4	4
			2	2	5	7
			3	0	1	1
			5	1	1	2
		Total				14

**1 = Pre contemplation **2 = Contemplation ***3 = Preparation ****4 = Action *****5 = Maintenance*

Table 3. Stage of change (SOC), Body Mass Index (BMI), Decisional Balance (DB) and Self Efficacy (SE)

(DB) **Decisional Balance**	(SE) **Self Efficacy**	(SOC) **stage of change**		**Body Mass Index(BMI)**					**Total**
				20-24.99	25-29.99	30-34.99	35-39.99	>40	
very low	high	stage of change	1*		1				1
		Total							1
low	high	stage of change	5*****				1		1
		Total							1
average	average	stage of change	1	1		1	1		3
			2**	1		0	0		1
		Total							4
	high	stage of change	1		3	1	0		4
			2		1	1	1		3
			3* * *		1	0	0		1
			4* * **		1	0	0		1
			5		0	1	0		1
		Total							10
	excellent	stage of change	1	0	4	5	2	0	11
			2	1	6	4	2	1	14
			3	2	3	4	1	0	10
			4	1	1	0	1	0	3
			5	0	2	1	1	0	4
		Total							42
high	average	stage of change	1	0	4	3			7
			2	1	3	1			5
			3	1	0	1			2
			4	0	0	1			1
		Total							15
	high	stage of change	1	1	13	5	0	1	20
			2	2	6	7	2	0	17
			3	0	2	5	0	0	7
			4	0	2	0	0	0	2
			5	0	1	0	1	0	2
		Total							48
	excellent	stage of change	1	2	10	4	2		18
			2	4	8	7	1		20
			3	1	10	2	0		13
			4	0	4	4	1		9
			5	4	6	2	0		12
		Total							72
excellent	low	stage of change	1			1			1
		Total							1
	average	stage of change	1		2				2
			2		1				1
		Total							3
	high	stage of change	1		2	2	1		5
			2		2	1	0		3
			3		1	0	0		1
		Total							9
	excellent	stage of change	1	0	2	1	1		4
			2	1	2	4	0		7
			3	0	0	1	0		1
			5	0	1	1	0		2
		Total							14

1 = Pre contemplation **2 = Contemplation ***3 = Preparation ****4 = Action *** 5 = Maintenance*

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Menstrual syndrome comparison of athletes and non-athletes

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Abstract

Purpose: Exercise was often recommended for the PMS management but in the literature there are some discrepancies. Based on this reason the purpose of this study was to evaluate the PMS status of the athletes and non-athletes.

Methods: 288 athletes (age 20.47±0.15 years; menarche age 13.48±0.10 years; height 168.42±0.61 cm; weight 58.90±0.63 kg) and 242 non-athletes (age 20.32±0.19 years; menarche age 12.97±0.16 years; height 163.35±0.53 cm; weight 55.57±0.69 kg) were participated the study. The athletes' mean sports age was 11.03±0.12 years and they have a training at least 4 days a week for 2 hours [handball n=36; basketball n=59, volleyball n = 99, football n=40; taekwondo n = 54]. Demographic Data Questionnaire and Menstrual Distress Questionnaire (MDQ) (1) were used to collect data. In order to compare the syndrome scores of athletes and non-athletes Mann Whitney U test and for the comparison of menstruation characteristicsChi-square test was used.

Results: The mean number of menstruation in a year, frequency of menstruation and length of menstrual flow was compared between athletes and non-athletes and no significant differences were found ($p>0.05$). PMS scores were compared in each menstruation phase, and premenstrual PMS scores were found significantly higher in non-athletes than athletes ($p<0.05$). Menstrual and inter-menstrual PMS scores were not found significantly different between these two groups ($p>0.05$). The pain, water retention, negative affect and control scales show significantly higher scores in non-athletes than athletes in premenstrual phase ($p<0.05$ and $p<0.01$). Only the arousal scale scores were found significantly higher in athletes than non-athletes in premenstrual and menstrual phases ($p<0.05$).

Conclusion: Findings of this study show that exercise is another way to relieve premenstrual symptoms and exercise can be the most useful therapy for PMS. Exercise seems to be the best non-pharmacologic agent to overcome the symptoms of PMS.

Key Words: Menstrual syndrome, athletes, non-athletes.

Introduction

The repeated rhythmic changes occurevery month in the sexuallyactivewomen for the purpose of sexual reproduction and fertilization. These changes include the amount of secreted hormones and events that occurin the sexual organs. Thisrhythmicchangeis calledmenstruation (2). Menstruation is a woman's monthly bleeding (3).

The adolescent can present with a wide variety of menstrual dilemmas and disorders (4).Physical symptoms such as headache, blood pressure, and bloating and emotional symptoms such as depression and anxiety have all been shown to fluctuate throughout the menstrual cycle (5). Premenstrual Syndrome (PMS) is used to describe an array of predictable physical, emotional, cognitive, affective and behavioral symptoms that consistently occur cyclically during the last part of the luteal menstrual cycle and resolve quickly at or within a few days of the onset of menstruation (4, 6, 7).

PMS symptoms occur 1 to 2 weeks before your period (menstruation or monthly bleeding) starts. The symptoms usually go away after you start bleeding. PMS can affect menstruating women of any age and the effect is different for each woman. For some people, PMS is just a monthly bother. For others, it may be so severe that it makes it hard to even get through the day (8).Many women experience PMS symptoms, particularly physical symptoms such as breast tenderness and swelling, at some time in their reproductive years, but do not perceive these symptoms as either distressing or debilitating (9). Most females of reproductive age will note some PMS symptoms, while 3%-8% report severe enough emotional features (10, 11).

Common symptoms of PMS are fatigue, irritability, bloating, anxiety, breast tenderness, mood swings, depression and food cravings, but more than 200 symptoms have been associated with the condition (12). PMS goes away when your monthly periods stop, such as when you get pregnant or go through menopause (8).

There is a wide range of treatment options available, ranging from lifestyle modifications through hormonal treatment to selective serotonin re-uptake inhibitors (13). Non-pharmacologic management with some evidence for efficacy include cognitive behavioral relaxation therapy, aerobic exercise, as well as calcium, magnesium, vitamin B6 L-tryptophan supplementation (14) or a carbohydrate intake (15). Exercise as an approach to treatment of specific conditions is often overlooked in the practice of conventional medicine (16). Some studies suggest that exercise is helpful for PMS, and experts recommend physical training as a first-line treatment strategy (17).

Previous studies show inconsistent data about the effect of physical activity on PMS. Some of the studies defended a positive effect (16, 18, 19,20, 21, 22,23). Some studies show no association (24, 25, 26). Kritz-Silverstein et al (1999) examined the association of obesity, cigarette smoking, alcohol consumption, and exercise with the prevalence of menstrual cycle disorders. Obesity, exercise, and alcohol consumption did not show consistent associations with menstrual symptoms or cycle disorders (26). Some studies show increased risk of PMS among the exercising females (27, 28). In the study of Deuster et al. (1999), women with PMS were 2.9 times more likely to be physically active than women without PMS (27). Exercise was often recommended for the PMS management but in the literature there is some discrepancies. Based on this reason the purpose of this study was to evaluate the PMS status of the athletes and non-athletes.

Method

288 athletes (age 20.47±0.15 years; menarche age 13.48±0.10 years; height 168.42±0.61 cm; weight 58.90±0.63 kg) and 242 non-athletes (age 20.32±0.19 years; menarche age 12.97±0.16 years; height 163.35±0.53 cm; weight 55.57±0.69 kg) were participated the study. The athletes' mean sports age was 11.03±0.12 years and they have a training at least 4 days a week for 2 hours [handball n=36; basketball n=59, volleyball n=99, football n=40; taekwondo n=54].

Demographic Data Questionnaire and Menstrual Distress Questionnaire (MDQ) (1) were used to collect data. MDQ questionnaire was adapted to Turkish society in 1992 and the reliability coefficients was found 0.71-0.91 (29). Characteristics of participants were investigated using Demographic Data Questionnaire. These included age, sports age, weight, height, sports branch, training time, menarche age, number of menstruation in a year, frequency of menstruation (day) and length of menstrual flow (day). The data were collected byface-to-face surveymethod.

The MDQ requires subjects to rate their symptoms using a five-point Likert type scale (0-4) ranging from "no experience of symptoms" to "very severe" over 47 symptoms. Each subject made these ratings separately for the menstrual (during menstrual flow), premenstrual (the week before the beginning of menstrual flow), and inter-menstrual (remainder of cycle) phases of her most recent menstrual cycle.

The eight scales of the MDQ are pain (6 symptoms), water retention (4 symptoms), autonomic reaction (4 symptoms), negative affect (8 symptoms), impaired concentration (8 symptoms), behavioral change (5 symptoms), arousal (5 symptoms) and control (6 symptoms). Each scale (8 scales) scores were calculated separately, and then the total scores were calculated.

The data obtained from the research were analyzed in SPSS version 19.0 package program. In order to compare the syndrome scores of athletes and non-athletes Mann Whitney U test and for the comparison of menstruation characteristics Chi-square test was used. Mean and Standard Error was given in tables.

Results

Menstrual cyclist characteristics were given in table 1. The mean number of menstruation in a year, frequency of menstruation and length of menstrual flow was compared between athletes and non-athletes and no significant differences were found ($p>0.05$).

Table 1. Menstrual Cyclist Characteristics of Athletes and Non-Athletes

Menstrual Cyclist Characteristics n (%)		Athletes n (%)	Non-Athletes
Number of menstruation in a year	8 and lower	20 (6.9)	24 (9.9)
	9-11	100 (34.7)	62 (25.6)
	12 and upper	168 (58.4)	156 (64.5)
		p = 0.236	
Frequency of menstruation	21-30 day	242 (84.0)	212 (87.6)
	30-90 day	46 (16.0)	30 (12.4)
		p = 0.408	
Length of menstrual flow (days)	2-5 days	208 (72.2)	158 (65.3)
	6 and over	80 (27.8)	84 (34.7)
		p = 0.224	

Table 2. Scores of PMS in Each Phase of Menstruation

Phases		Score	p value
Premenstrual	Non-Athletes	46.89±2.64	0.017*
	Athletes	37.76±2.64	
Menstrual	Non-Athletes	58.19±2.89	0.270
	Athletes	53.65±3.11	
Inter-menstrual	Non-Athletes	17.80±1.82	0.421
	Athletes	15.25±1.73	

**p<0.05*

PMS scores were compared in each menstruation phase and premenstrual PMS scores were found significantly higher in non-athletes than athletes ($p<0.05$). Menstrual and inter-menstrual PMS scores were not found significantly different between these two groups ($p>0.05$).

The mean and standard errors for the eight scales in each phase were shown in Table 3. The pain, water retention, negative affect and control scales show significantly higher scores in non-athletes than athletes in premenstrual phase ($p<0.05$ and $p<0.01$). Only the arousal scale scores were found significantly higher in athletes than non-athletes in premenstrual and menstrual phases ($p<0.05$).

Discussion

The current study examined the premenstrual syndrome of athletes and non-athletes. The two groups' menstrual cyclist characteristics such as number of menstruation in a year, mean frequency of menstruation, length of menstrual flow were found similar. The average menstrual cycle is 28 days long. Cycles can range anywhere from 21 to 35 days in adults and from 21 to 45 days in young teens (3). In the present study 84% of athletes and 87% of non-athletes frequency of menstruation was between 21-30 days.

In the current study the PMS scores were found higher in non-athletes than athletes in premenstrual phase. But in menstrual and inter-menstrual phases no significantly differences were found in total PMS scores between two groups. This finding coincides with the results of previous studies (16, 20, 22). Khademi et al (2008) assessed the PMS symptoms between swimmer and non-swimmer female students. In their study 140 subjects were swimmers, 140 were normal sedentary controls. PMS occurred in 36.2% and 22.8% of non-swimmers and swimmers, respectively. The prevalence of PMS was found to be lower in swimmers than non-swimmers (16). Bayram (2007) compared the PMS symptoms of basketball players and sedentary females. She found the PMS scores of sedentary females significantly higher at each of the three menstrual, premenstrual and inter-men-

Table 3. Scores of Menstrual Syndrome in Each Scales of Menstruation

Scales	Phases	Subjects	Score	P value
Pain	Premenstrual	Non-Athletes	8.18±0.42	0.046*
		Athletes	7.03±0.47	
	Menstrual	Non-Athletes	10.29±0.44	0.753
		Athletes	10.45±0.53	
	Inter-menstrual	Non-Athletes	2.20±0.29	0.866
		Athletes	2.02±0.26	
Water Retention	Premenstrual	Non-Athletes	6.17±0.30	0.001**
		Athletes	4.68±0.31	
	Menstrual	Non-Athletes	6.12±0.31	0.015*
		Athletes	4.99±0.31	
	Inter-menstrual	Non-Athletes	1.78±0.25	0.374
		Athletes	1.25±0.17	
Autonomic reaction	Premenstrual	Non-Athletes	2.29±0.25	0.678
		Athletes	2.31±0.26	
	Menstrual	Non-Athletes	3.41±0.31	0.200
		Athletes	3.71±0.30	
	Inter-menstrual	Non-Athletes	0.82±0.15	0.943
		Athletes	0.91±0.27	
Negative affect	Premenstrual	Non-Athletes	9.99±0.68	0.025*
		Athletes	7.65±0.66	
	Menstrual	Non-Athletes	12.06±0.67	0.374
		Athletes	11.31±0.76	
	Inter-menstrual	Non-Athletes	2.97±0.43	0.956
		Athletes	2.58±0.38	
Impaired concentration	Premenstrual	Non-Athletes	5.58±0.51	0.167
		Athletes	4.51±0.53	
	Menstrual	Non-Athletes	7.38±0.61	0.398
		Athletes	6.82±0.69	
	Inter-menstrual	Non-Athletes	2.14±0.32	0.798
		Athletes	2.07±0.37	
Behavioral change	Premenstrual	Non-Athletes	5.40±0.41	0.081
		Athletes	4.52±0.46	
	Menstrual	Non-Athletes	7.43±0.46	0.628
		Athletes	7.27±0.55	
	Inter-menstrual	Non-Athletes	1.95±0.23	0.315
		Athletes	1.81±0.29	
Arousal	Premenstrual	Non-Athletes	2.83±0.29	0.024*
		Athletes	3.85±0.32	
	Menstrual	Non-Athletes	3.08±0.31	0.026*
		Athletes	3.84±0.34	
	Inter-menstrual	Non-Athletes	3.72±0.34	0.109
		Athletes	3.99±0.33	
Control	Premenstrual	Non-Athletes	4.09±0.34	0.049*
		Athletes	3.16±0.33	
	Menstrual	Non-Athletes	5.23±0.38	0.121
		Athletes	4.46±0.42	
	Inter-menstrual	Non-Athletes	1.43±0.21	0.225
		Athletes	1.04±0.20	

*$p<0.05$ **$p<0.01$

strual phases (22). Aganoffand Boyle (1994)examined the effects of regular, moderate exercise on mood states and menstrual cycle symptoms. Regular exercisers ($N = 97$), and a non-exercisers ($N = 159$), completed the Menstrual Distress Questionnaire (MDQ) and the Differential Emotions Scale (DES-IV). The regular exercisers obtained significantly lower PMS scores (20).

Aerobic exercise has shown some beneficial effect when used in the treatment of PMS (20). Steege and Blumenthal (1993) evaluated the effects of aerobic exercise and strength training on premenstrual symptoms in 23 healthy premenopausal women. Premenstrual symptoms were assessed at baseline and following 3 months of exercise participation. Results showed that while participation in both exercise conditions was associated with general improvement in many premenstrual symptoms, subjects in the aerobic exercise group improved on more symptoms, especially premenstrual depression than non-aerobic exercise group (23). Regular exercise was found to be effective for relieving symptoms of PMS (19, 20, 30, 31). The efficacy of exercise may be related to release of endorphins, counteracting possible declines in endorphin levels in the luteal phase (6, 32).

In the study of Pinar et al (2011) and Demir et al (2006) the frequency of PMS decreases in those who do exercise regularly, but this difference was not statistically significant (24, 25). In the study of Lustyk (2004) based on premenstrual symptoms, women were divided into high and low PMS groups. While exercise volume and intensity did not impact any of the variables assessed, women with high PMS who reported exercising "sometimes" had more stress than women who reported exercising "often" or "never" (33).Conversely, our results are different than the results of mentioned studies which reported no significant differences between PMS scores of exercising and non-exercising group.

In the present study the prevalence of each scale scores were compared between athletes and non-athletes. The pain, water retention, negative affect, arousal and control scales show different mean scores between two groups ($p<0.05$ and $p<0.01$).

Pain scale showed higher mean scores in non-athletes during the premenstrual phase.It means that non-athletes have more pain than athletes. This finding coincides with the results of previous studies (20, 22). Bayram (2007) have found frequency ofdysmenorrhea 59% in athletes and 76% in sedentary females (22). It's known that complaints of abdominal pain, backache and headache were experienced by some women (29). Regular exercise training appears to ameliorate the problem of abdominal cramps, probably due to lowering the levels of prostaglandins (34). Dysmenorrhea is chronic, cyclic, pelvic, spasmodic pain associated with menstruation in the absence of identifiable pathology and is typically known as menstrual cramps or period pain. The notion that exercise might help to relieve pain associated with menstruation is not new. Behavioral interventions such as exercise may not only reduce dysmenorrhea, but also eliminate or reduce the need for medication to control menstrual cramps and other associated symptoms (35). Some studies showed exercises can reduce the incidence dysmenorrheal (35, 36, 37).Dusek (2001) used questionnaires to determine the dysmenorrhea in 72 active female athletes and 96 sedentary control group aged between 15 and 21. They found prevalence of dysmenorrhea was twofold lower in athletes than in the control group (38). These previous studies support our findings that the prevalence of menstrual pain is higher in non-athletes.

The other significantly different scale score was water retention. Non-athletes' water retention scores were higher than athletes in premenstrual and menstrual phase. In the previous studies, symptoms such as weight gain, swelling in the abdomen and joints and painful breasts were experienced by females (29, 39, 40). Prior et al (1987) evaluated exercise effect on premenstrual symptoms. Six months of exercise training was associated with decreased premenstrual symptoms in exercising group of women. There was no change in symptoms in non-training women. For sedentary women who began to exercise and 7 runners who began training for a marathon; breast symptomatology scores and fluid retention symptoms scores decreased (19).

Autonomic reaction symptoms such as hot flashes, cold sweats, faintness and dizziness complaints were determined in premenstrual and menstrual phases (29, 40, 41). In the present study autonomic reaction scores were found similar in two groups. Aganoffand Boyle (1994) found the

same result as in our study. Autonomic reactions did not differ significantly between exercisers and non-exercisers in their study (20).

Negative affect scores were higher in non-athletes in premenstrual phase. This means that non-athletes were more depressed than athletes. The literature shows that the most complaints of negative affect scale were tension, depression, mood swings and anxiety (39, 40). Exercise has been found helpful in ameliorating mood alterations, without the untoward side effects of medications. Stress reduction seems to be the primary mode of action (42). The regular exercisers obtained significantly lower negative affect scores than non-exercisers in the study of Aganoffand Boyle (1994). Their results suggest that women who undertake regular, moderate, aerobic exercise show significantly lower levels of negative mood states, (anger, contempt, disgust, sadness, hostility, fear, shame, shyness, and guilt), than non-exercisers (20). Accordingly, Fremont and Craighead (1987) exercise may produce increased levels of endorphins that influence mood. Their results suggest that supervised involvement in aerobic exercise may be a viable and cost-efficient alternative treatment to traditional individual verbal therapy for some individuals experiencing difficulty with dysphoric moods (43). In the study of Choi and Salmon (1995) mood states and physical symptoms of 143 women were monitored for five days in each of the three phases of the cycle (mid-cycle, premenstrual and menstrual). The women were 35 competitive sportswomen, two groups of exercisers (33 high exercisers and 36 low exercisers) and 39 sedentary women. The high exercisers experienced the greater positive affect and sedentary women the least. The high exercisers also reported the least negative affect. Their results were consistent with the belief that women who frequently exercise may be to some extent protected from deterioration of mood before and during menstruation (21). But in the study of Prior et al (1987), after a 3 month exercise no significant changes were found in depressive symptoms (19).

In the current study impaired concentration scores were lower in athletes but it's not significantly different between two groups. In the earlier studies the most symptoms of impaired concentration were distractible, confusion, difficulty concentrating, insomnia and lowered coordination (29, 41, 44). In the study of Aganoffand Boyle (1994) the regular exercisers obtained significantly lower scores on impaired concentration (20).Bayram (2007) examined the impaired concentration scores of sedentary females higher than basketball players (22).

Behavioral change scale score was found lower in athletes than non-athletes but this difference was not in statistical size. In the study of Kizilkaya and Coşkun (1995) the symptom that lowered school or work performance was mostly determined (45). In the study of Bloch et al (1997) near the impaired work performance, avoid social activities symptom was determined (46). It's notified that the regular exerciser group PMS scores on behavior change was lower than non-exercisers (20).Duenas et al study (2011) indicates that daily life activities are significantly affected by the presence of premenstrual symptoms (47). Chen and Chen (2005) found that the menstrual pain impact on daily activity rate was 92.4%, and the school absenteeism rate was 25.3% (48).

Arousal scale scores were low in both groups but as an interesting these scores were higher in athletes than non-athletes in premenstrual and menstrual phases. But in the study of Bayram (2007) the sedentary females' arousal scores were higher than basketball players (22). The symptoms of arousal scale are affectionate, orderliness, excitement, feelings of well-being and bursts of energy.In addition to the physical benefits of exercise, both short-term exercise and long-term aerobic exercise training are associated with improvements in various indexes of psychological functioning (49). Venne et al (2011) examined the relationship between athletic participation and optimism levels of athletes and non-athletes. Results indicated that final-year athletes scored significantly higher levels of optimism than first-year athletes and final-year non-athletes (50).

Another scale which is control scores was found higher in non-athletes. In the previous studies the most common symptoms of control scale were feeling of suffocation, chest pains, heart pounding, blind spots and fuzzy vision (29, 41). Consistent with the current study, Bayram (2007) has found the control scores higher in sedentary females than basketball players (22).

There is a wide range of proposed therapeutic regimens for the treatment of PMS (51). Although

selective serotonin reuptake inhibitors are considered the first-line treatment option for premenstrual syndrome, several other such options are also available (32). Exercise as an approach to specific conditions is often overlooked in the practice of conventional medicine. In the case of PMS, a number of studies have examined the role of aerobic exercise and evidence suggests this may be an effective therapy for PMS (6, 31). So, future studies including exercise and also different types of exercise are needed. As a conclusion,findings of this study show that exercise is another way to relieve premenstrual symptoms and exercise can be the most useful therapy for PMS. Exercise seems to be the best non-pharmacologic agent to overcome the symptoms of PMS.

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Penile fracture - presentation, treatment and complications

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Abstract

The penile fracture is an uncommon urologic emergency characterized by the rupture of the corpus cavernosum and the tunica albuginea, which covers the penis erectile structures. It is caused by a sudden increase in the intracavernous pressure due to an extrinsic trauma. The typical presentation is an audible popping sound, followed by flaccidity, deformity and significant hematoma. In most cases, surgery is successful, but some patients can develop complications such as erectile dysfunction, fistulas, pain and deviation of the penis. This review brings important aspects of medical literature about its clinical presentation, surgical technique and typical complications.

Key words: fracture, penis, trauma, erection.

Introduction

The penile fracture is an uncommon urologic emergency. The first case dates from 1924 and the largest series published to date brings an total of 172 cases[1]. It is a closed penile trauma caused by a sudden increase in blood pressure lodged inside the corpora cavernosa, leading to rupture of this erect corpus cavernosum and the tunica albuginea, which is weakened in the erect penis. The pressure increase is determined by extrinsic mechanisms, of which the most common is the trauma of sexual intercourse itself. In most cases, this rupture occurs at the base of the penis and makes the blood volume repressed under great pressure in the erectile bodies leave these structures to form a hematoma[2]. The penis loses that moment, his state of erection and become flaccid and deformed with significant swelling.

Typically, a penile fracture is also accompanied by an audible popping sound and strong local pain[2]. The very characteristic clinical presentation allows the diagnosis of this pathology to be done clinically, although complementary examinations are useful to identify the exact location and extent of the disruption. The integrity of the tunica albuginea is the most important factor for determining the surgical procedure required in most patients[3].

The procedure, which consists in finding and repairing the rupture, presents usually good results. A considerable number of patients, however, develop complications and sequelae, such as pain in the erection or sexual intercourse, erectile dysfunction, deviation of the penis, priapism and fistulas[4].

The aim of this review is to collect information from the specialized literature about the clinical presentation, diagnosis and treatment of penile fracture, also focusing the immediate and late complications found in patients submitted to surgical correction of this pathology.

Methods

This article results from a literature review performed between March and April 2012. We searched two databases: SciELO (Scientific Electronic Library Online) and Medline. For the final composition of the manuscript, were also used reference books about human anatomy and urologic surgery.

The medical databases were searched from 20 to 24 March 2012, with the descriptors “penile fracture”, “penile trauma”, “tunica albuginea”, “corpora cavernosa”, “cavernosography” and their corresponding terms in Portuguese. As results, the search returned a total of 36 articles, of which only 15 were selected for final review.

Results and discussion

The penis is composed by three erectile structures: two corpora cavernosa, arranged dorsally, and one corpus spongiosum, ventrally. Each of the corpora cavernosa have a fibrous outer, called the tunica albuginea, and consists of distensible venous structures: the sinusoids. Above it and below

the skin, Buck's fascia, or fascia of the penis, is a strong membranous lining that joins the corpora cavernosa and spongiosum[5].

In the penis flaccid state, the tunica albuginea has up to 2mm thick, which is reduced to 0.25 to 0.5 mm during the erection. The erect corpora cavernosa determine a pressure of until 1500mmHg to the membranous coat, which may be suddenly elevated by an extrinsic trauma and cause a tear in a point of weakness in the tunica albuginea[2].

The frequency of trauma mechanisms varies with the region. In the United States, penile fractures mostly result of traumatic sexual intercourse, especially the impact of the erect penis against the pubic symphysis or the perineum[4]. In Japan, only 19% are related to sexual relations, while most are caused by masturbation or occurs during sleep when the patient rolls over the erect penis[3]. According to Brazilian data from 2004, 68% of fractures are related to sexual intercourse. There are also in the literature reports about animal bites and simple falls during erection[6].

Clinical presentation

The clinical presentation of penile fracture is quite characteristic. Usually, the moment of rupture of the corpus cavernosum and the tunica albuginea is signaled by a slight, but audible popping sound. Then there is a rapid detumescence of the penis, with the development of a hematoma and extensive swelling or penile curvature. The pain can vary from mild to severe, and it is not related to the seriousness of trauma. The penis also deviates to the opposite side of the break[2].

The ruptures occur in the proximal third of the corpora cavernosa in 75-91% of cases. Some studies talk about a greater involvement of the right side (71-75%) and the ventral region of the penis. The extent of rupture frequently varies between 0.5 and 3.5 cm and is directed transversally[7].

On physical examination, palpation can detect the rupture site due to the overlying hematoma. This hematoma is firm, immobile and can be felt with the movement of the penile skin over it. Less commonly, fractures can develop penile swelling involving the scrotum, perineum, or suprapubic area, determined by the leakage of the hematoma through Buck's fascia[8].

Urethral injuries are associated in 20-38% of cases and are usually discovered through microscopic hematuria at the urinalysis exam9. The routine urethrography is not necessary, but has sensitivity close to 100%. Dysuria, urinary retention and frank hematuria are associated with more extensive urethral injury, which occurs less frequently and deserves more detailed investigation.

Imaging examination

Although the diagnosis of penile fracture can be established without complementary examinations, they may be useful to exclude possible diagnostic confusion and, furthermore, to locate the point of rupture and its extension, enabling a more accurate surgical planning.

The cavernosography can be used and consists of injecting 15 to 70 ml of non-ionic contrast into the intact corpus cavernosum, which will flow to the region of rupture, and perform serial radiographic images in anteroposterior and obliquous[10] incidences. This procedure is associated with complications such as priapism, allergic reactions and fibrosis of corpora cavernosa. It can be performed in the intraoperative, in the same way[11].

Ultrasound is an inexpensive, noninvasive method, but is operator dependent, can be unable due to the patient's pain and has limited accuracy. Magnetic resonance imaging is the best method to assess the rupture, supported by the best ability to differentiate structures, such as the characteristic hypointense signal on T1 and T2 of the tunica albuginea. It can even identify associated lesions in the urethra and corpus spongiosum[12,13].

Treatment

Until the 1980s, expectant management with cryotherapy, bladder catheterization and extrinsic compression was widespread[2]. After several studies, this approach was related to a higher incidence of complications[8,14]. The treatment modality widely accepted today is surgery, preferably within the first 24 hours after the rupture or as soon as the patient submits for an able service. However, there are reports of patients who sought the hospital until 30 days after trauma. The delay in seeking surgical treatment is related to a higher incidence of sequelae[15].

The most recommended surgical incision is the circumferential distal, followed by degloving the penis, which has better cosmetic results and allows bilateral exposure and possible repair of associated lesions[2]. Some surgeons use the incision over the hematoma. The technique is initiated by evacuating the hematoma, identifying the point of rupture of the tunica albuginea and performing a debridement of the tear site, if necessary[15]. Should be performed the ligation of disrupted vessels, if any, and the repair of the tear of the tunica albuginea with absorbable suture. Urinary catheter is recommended, but the use of compression bandages, antibiotics and inhibitors of erection depends on the urologist professional[7].

Complications

The incidence of complications and sequelae in operated patients varies from 6 to 25%[16]. The most common complication is the deviation of the penis, in 14-22% of cases, which may be only esthetic or severe. Dyspareunia, painful erection and erectile dysfunction are not uncommon findings, observed in 9-22%. Other complications, most related to failing in the identification of associated lesions are arteriovenous fistulas, urethrocavernous fistulas and urethral stenosis[17].

Conclusion

The presentation of the penile fracture is very characteristic, allowing a clinical diagnosis with certainty. The complementary examinations are very useful in assessing the location and extent of the rupture and the identification of associated injuries, which account for a significant share of post-surgical complications.

The early surgical treatment is indicated and necessary, since the conservative approach tends to make more sequels. The surgery has a relatively simple technique that enables the repair of the tear and produce good results for the patient. However, it can produce risk of uncomfortable deformities and dysfunctions, especially related to sexual activity.

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Prevalence of Hepatitis C virus genotypes in the Northern of Iran (Mazandaran) from 2009 to 2011

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Abstract

Background: HCV has been classified into six major genotypes and multiple subtypes. Prevalence of HCV genotypes are most distributed among of areas in the worldwide. In this study the genotype of HCV were identified in HCV positive patients by Real Time Polymerase Chain Reaction (RT-PCR).

Methods: HCV - positive serum samples of 86 patients with chronic hepatitis from 2009 to 2011 were studied. HCV-RNA was extracted from plasma samples using Qiagen RNeasy Mini Kit. Plasma samples from HCV positive patients were confirmed the presence of HCV nucleic acid and determined the genotypes of HCV genome by RT- PCR using the PureLink Viral RNA/DNA Kits (Invitrogen) and Amp-license Russia genotype kit with type of specific primers and probs. All samples were examined in the virology laboratory of Sari Medical School.

Results: The mean age of patients were 39+/-14.3 (range, 18 to 72) year that 74 (86%) patients were male and 12 (14%) were female. The mean average serum level of AST and ALT was 89.5 and 103.7 IU/lit. In this study, 58.1% had genotype 3a and 41.9% had genotype 1a/b.

Conclusion: This study indicates that the genotype 3a is the most frequent followed by the genotype 1a/b in our region. Prevalence and incidence of HCV genotypes are with distributed among of areas and different genotypes show different responses with alpha interferon therapy. So, it is very important to determine the predominant subtypes of HCV.

Key words: Hepatitis C virus, Genotype of HCV, RT-PCR

Introduction

Hepatitis C virus is a factor for progressive liver diseases such as chronic hepatitis, cirrhosis and hepatocellular carcinoma (1) specially co-infected with human immunodeficiency virus (2). World Health Organization (WHO) estimation of HCV prevalence, suggests that there are 170 million HCV-infected patients worldwide (up to 3% of the worlds population) and about 3 to 4 million people are newly infected each year (3, 4). The seroprevalence of HCV in general population of Iran was reported as 0.5 to1 % (3), but increase to 6.7% in hemodialyzed patients (4) and 20% and even 60% in multiple transfused patients with thalassmia (5-9). Infection with HCV has been found to be asymptomatic like carrier but in approximately 80% of patients who become infected with HCV develop chronic hepatitis C and 20% of patients showed severe liver disease (10). HCV is an enveloped, single stranded RNA sense positive virus with a genome of approximately 9600 bass pairs. It has been classified into six major genotypes and multiple subtypes (11, 12). Prevalence and incidence of HCV genotypes are mostly distributed around the world; and amongst them type 1 is the major HCV genotype worldwide 1 (13, 14). Countries like Italy, Austria and Mexico, genotype 1 is the most predominant of types of HCV (15-17), whereas in India, genotype 3a is the most predominant (18) and genotype 4, 5 and 6 are very common in Egypt, South Africa, and Southeast Asia respectively (19).

Different studies, HCV are a most problem in Iran. In southwest of Iran, the result of HCV genotyping has been reported as 53.3% for 1a and 46.5% for 3a (20), and in other study from central area of Iran, HCV genotype distribution was 1a/b in 50% of patients and 3a in 18.2% of patients (21). The most common HCV genotype in the Northwest of Iran was type 3a (22). In population-based study from Iran, 1a and 3a were the predominant genotypes (23). It has been reported that

the most common genotype of HCV in Iranian hemodialysis and thalassemia patients were 1a/b (24, 25) and in non uremic patients were 3a (24).

It is very important to have information of epidemiology of HCV genotyping as different response to therapy has been reported to different type of HCV; therefore, its successful treatment has major value in quality of life of patients infected with HCV. Certain strain of HCV may have enhanced virulence than others and different genotypes show different responses with antiviral therapy. Although the genotype of the infecting virus is one of the essential predictors of response to treatment. HCV genotype 1 was not responding to therapy as well as genotype 2 and 3. Genotype 1 also may be associated with more severe liver disease and high-risk of hepatocellular carcinoma (14, 26). The available data on HCV genotype in Iran are very heterogeneous. Therefore in this study, we tried to identify the HCV genotypes by using Real Time polymerase chain reaction (RT-PCR).

Methods

Samples

During 2009- 2011, serum samples from 86 HCV positive patients with chronic hepatitis referred to Razi Hospital Infections Disease Center (Mazandaran province, north of Iran) were collected. Chronic hepatitis C was defined as infectious if the virus was persistent for more than six months. The blood samples were centrifuged and plasmas were separated and immediately stored at -70°C. All patients had elevated serum aminotransferases a positive test for anti- HCV antibodies using enzyme linked immunosorbent assay (ELISA), and HCV genotypes were determined by RNA extraction kit using standard protocol. Factors such as, age, gender, suspected sources of infection (high-risk sexual relation, injective addiction and blood transfusion), last laboratory tests results (AST and ALT) were chosen through questionnaire for all patients. The data analyzed with SPSS 17 and t-test and fisher's exact test and $P<0.05$ considered as a significant result.

RNA extraction

RNA extraction from plasma samples was extracted by RNeasy Mini Kit (Qiagen) using standard protocol. HCV was isolated from serum on following procedures; 100µl plasma of patients with 1000 µl solution mixed and incubated for 5 minutes at room temperatures, after that 200 µl of clorophorm added to it and then incubated for 5 minutes at 4°C. Samples were centrifuged for 2 minutes at 12000 revolutions per minute after finishing centrifuge, overlaged liquid separated and added in to the sam volume isaprolanes and incubated for 15 minutes at 20°C. Then resulted solution centrifuged for 10 minutes at 12000 revolutions per minute. Next, overlayed fluid discharged and tube content remained solution washed with 70% Alcohol and centrifuged. After finishing it, overlaryed liquid discharged and resulted residue in 15 minutes, dried in 68-70°C. Finally, the pellet was re-suspended in 50 µl sterile distilled water and RNA quantification was determined using a spectrophotometer and resulted residue solved for next stages. All samples were examined in the virology laboratory of Sari Medical School.

Real time RT-PCR

Total RNA was isolated from serum samples and was done RT-PCR using the PureLink Viral RNA/ DNA Kits (Invitrogen) and Amp-license Russia genotype kit (Invitrogen) according to special protocol with primers and individual probs. All steps of preparing reactional mix over ice resells have been performed and primers and probes, after diluting, stored in -20°C. Examination method summarized as follow: 2x Reaction Mix 10µl, Forward Primer (40 UM) 0.4µl, Reverse Primer (40 UM) 0.4µl, Probe (10UM) 0.4µl, Super Script III RT/ Platinum- Taq mix 0.4µl, RNase – DNase Free water 5.4µl, aggregation was 17µl. 16 µl of above reaction mix extracted with 4 µl of RNA extraction samples (40 ng gene), final reaction volume was 20 µl. The samples were placed into the 96-well real time RT-PCR plate and amplified. Amplification was proceeded at 60°C for 30 minutes, 95°C for 5 minutes and then for 40 cycles of 95°C for 15 seconds, 55°C for 30 seconds and 72°C for 30 seconds. PCR reaction was performed using a Corbett 6000–RG (RT–PCR) sequence detector. After this stage, by using computer program, immediately results has been determined in programming RT–PCR, in addition to positively of test, amount and quantity of virus was determined.

Results

During the study, 86 patients with HCV-positive were enrolled. The mean age of patients were 39 ± 14.3 (range, 18 to 72) year. 74 (86%) of patients were male and 12 (14%) of patients were female. Fifty four patients (62.8%) were married and 32 patients (37.2%) were single. The mean serum level of AST and ALT was 89.5 and 103.7 IU/lit respectively.

In this study, majority (51 patients; 59.3%) of HCV positive patients were intravenous drug users (IVDUs) and eight patients had a history of blood transfusions, one patient had organ transplantation, two patients had a needle stick, four patients had a long duration of hemodialysis, one patient had a family of hepatitis C virus and five patients had a major surgery (14 cases had unknown source infection). Our result also showed that three patients had cirrhosis (by biopsy).

Genotyping was using restriction fragment length polymorphism of HCV RNA positive serum samples. Of these, 78 (90.5%) of cases were infected only with HCV, 3 (3.5%) of cases were infected with HBV and HCV, 4 (4.7%) of cases were infected with HIV and HCV and so, one (1.2%) of cases were infected with HIV, HBV and HCV. 50 (58.2%) of cases were self employed, 20 (23.2%) of cases were not employed, 10 (11.6%) were house kipper, 2 (2.3%) were employed and 4 (4.7%) were students. In this study, 50 patients (58.2%) had genotype 3a and 36 patients (58.2%) had genotype 1a/b. There was no significant relationship between the types of HCV genotypes and the age of patients. The mean level of AST in genotype 1a (100.8±96.85 mg/dl) and 3a (76.7±79.78 mg/dl) was not significantly different (p=0.513). There wasn't significant different (p=0.281) between mean level of ALT in genotype 1a (140.5±99.9) and 3a (98.7±84.4). The distribution of HCV genotypes has not shown significant different (p=0.182) between IVDUs patients (18 patients, 35.3% had genotype 1a and 33 patients 64.7% had 3a) and Non-IVDUs patients (18 patients, 51.4% had genotype 1a and 17 patients 48.6% had 3a)

Table 1. Distribution of Hepatitis C virus genotypes in patients who referred to Razi Hospital from 2009 to 2011.

Genotype	Frequency(٪)
3a	50 (58.1%)
1a/b	36 (41.9%)
Total	86 (100%)

Discussion

Result from this study show that the genotype of 3a was the most frequent genotype and the genotype of 1a/b comes after that. Same to our study, it has been shown that the most frequent genotype of HCV infection in India was 3a (66.6%), followed by genotype 1 (18) and in non uremic patients in part of Iran was 3a (50%) (22). It has been reported that genotype 3a and 1 were the most frequent group of HCV (19). While several studies have been reported that the most prevalent of HCV infection were genotype 1, this is different comparing to our results. It has been reported that the prevalence of HCV genotype 1 in Belgium was 87.5% (27) and report in western part of Iran has been shown that the 1a (71.4%) was the dominant genotype in patients with hepatitis C in Tabriz, the 1b (14.2%) and 2a (7.1%) took the next places respectively (28). Of total HCV RNA was detected in HCV positive patients by RT-PCR, 71.4% were genotype 1a, 14.2% were genotype 1b, 7.1% were genotype 2a (29). In Italy, genotype 1 was detected in 49%, genotype 2 in 34.8% and genotype 3 in 11.9% (30). It has been reported that genotype 1 was the most common genotype in Estoni, 3a was the most common genotype in Thiland and the Indian subcontinent, Genotype 4 was the most common genotype in Africa and the Middel East, Genotype 5 was the most common genotype in South Africa and Genotype 6 was found in Southeast Asia (31).

In this study, the most of patients were male (male/female=6/1). As previously mentioned, patients with the history of intravenous drug abuse, blood transfusion, surgery and dialysis had the biggest part in infected patients respectively. A study in Turkey on 36 patients with HCV, the mean age of patients was 47.9 and most of them were female. The mean average levels of AST and ALT was 48, 64 respectively (32). Abraham et al.

(33) reported that 96 patients with hepatitis C, the main age of patients was 45.8 and the ratio of male to female was 2, which is different to our result. The most influential risk factors in catching the hepatitis C were previous surgery, blood transfusion, intravenous drug abuse that is different to our study. In our study there was no significant relationship between the types of HCV genotypes and the age of patients which is similar to some studies (33) while others found that the 1a and 3a is more frequents in the youngest and the 1b genotype is more frequent in the oldest (34).

In IVDUs patients, the frequency of genotype 3a was higher than 1a, but there was not significant different between IVDUs and Non-IVDUs patients. Today, IVDU is the major risk factor for HCV infection. Intravenous drug abusers not only have the highest prevalence of HCV infection but also constitute a potential reservoir of HCV in the community and needle-sharing among drug abusers as a major risk factor for infection (35).

Like other studies our study shows that male factor is a strong risk factor for HCV infected patients (36, 37). It seems that there are different types of HCV genotypes in different parts of Iran due to wide range of geographical distribution and influence of the neighbors in the abundance of different types of HCV genotypes. Furthermore, factors such as repeated blood transfusion and treatment of the patients also can be some of the most important criterias which can cause this wide range of different genotypes. Thus, further studies are needed to achieve the confirmation.

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The assessment of the diet knowledge level and daily dietary practice of the relatives of hemodialysis patients

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Abstract

Objectives: In this study, we aimed to investigate the level of nutrition and diet knowledge and the daily dietary practices of the relatives of hemodialysis patients.

Material and Methods: We recruited 39 relatives whose patients receiving hemodialysis, and who provided the patient's dietary needs. The questionnaire containing questions regarding daily salt, water, potassium and phosphate intakes was conducted to the patient's relatives. The questionnaire results were reflected to the graphics with numbers and percentages.

Results: The patient's relatives had sufficient information about the salt and water intakes, but they were not very sensitive to use their dietary knowledge during their daily practice. The relatives did not have enough information about the foods which containing phosphate and potassium and the clinical situations/complications related to the phosphor and potassium.

Conclusions: The nutrition and diet education should be also provided to the patients' relatives. Besides the education, the patients and the relatives should be followed up periodically to see if they apply their knowledge. The relatives especially should be instructed about foods containing salt, phosphate and potassium.

Key words: Hemodialysis, relative of patients, compliance of diet, questionnaire

Introduction

In patients with hemodialysis (HD), the bone mineral abnormalities, hypertension, interdialytic weight gain, cardiovascular disorders and electrolyte imbalances such as hyperpotassemia can be closely associated with patient's nutrition and diet (1-3). These complications can be minimized with good adherence to the diet regimens. In Turkey, usually one of the family members prepares the patient's meal. In this study, we investigate the level of nutrition and diet knowledge and the daily dietary practice of the relatives of hemodialysis patients who providing their cares and preparing their meals.

Materials and Methods

We recruited 39 hemodialysis patient's relatives who provided the patient's daily nutrition including main meals and snakes. The patients were on HD three times a week. Of the patients' relatives, 14 of them were patient's daughter, 10 of them were patient's wife, 6 were patient's daughter-in-law, 5 were patient's sister, 2 of them were patient's sister-in-law, 2 of them were patient's mother and one was patient's granddaughter. The questionnaires including questions about salt, water, phosphor and potassium intake in end-stage renal disease were conducted to the patients' relatives (Table 1). The answers were reflected to the graphics with numbers and percentages.

Results

The results of the answers were shown on the graphics with numbers and percentages. The results of the level of information about salt intake and the daily dietary practices of the relatives were demonstrated in graphics 1-4.

Table 1. Relatives Questionnaire

Relatives questionnaire

(Cooking in the patient, help the patient or accompanying persons shall apply to the nearest.)

1) **How much salt should hemodialysis patient consume a day?**

a. No salt should be given **b**. The natural salt in the meals should be enough

c. A little salt can be put on the meals **d**. one tea spoon **e**. 2 or more tea spoons

2) How much salt do you put the patient's meal a day?

a) None **b)** Very little **c)** Little **d)** Average **e)** I threw up dinner

3) Do you think if excessive salt intake may cause the following problems?

Hypertension ☐ Yes ☐ No ☐ Not known

Congestive Heart Failure ☐ Yes ☐ No ☐ Not known

4) Do you think if salt restriction is important in hemodialysis patient?

a) Very critically important **b)** Very important **c)** Important **d)** Not very important **e)** Unimportant

5) How much water should a hemodialysis patient take a day?

a) Very little **b)** Little **c)** Average normal **d)** Drink when thirsty **e)**Drink Plenty of water.

6) Which of the following food(s) is (are) rich in phosphate? (Scale 1- High 2- Low 3- Not known)

a) Meat ( ) **b)** Legumes (lentils, dry beans, Red Beans, etc.) **c)** Dairy products ( ) **d)** Nuts ( )

e) Wheat ( ) **f)** Whole-wheat bread ( ) **g)** Fatty foods ( ) **h)** Sugar

7) Do you think if phosphate may cause the following problems?

Atherosclerosis? ☐ Yes ☐ No ☐ Not known

Bone disorder ☐ Yes ☐ No ☐ Not known

8) Which of the following food(s) is (are) rich in potassium? (Scale 1- High 2- Low 3- Not known)

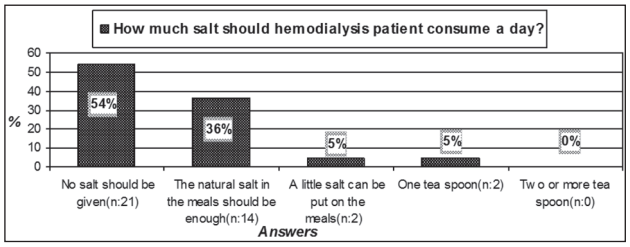
Vegetables( ) Banana( ) Orange( ) Date( ) Sour Cherry( ) Cherry( )

Beet greens( ) Spinach( ) Apple( ) Watermelon( ) Fruits( )

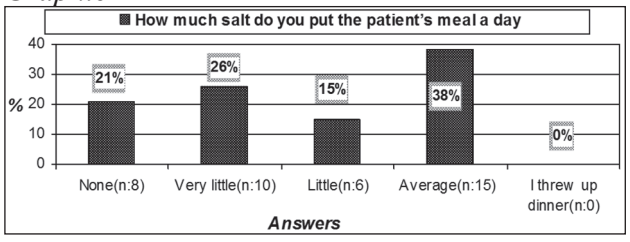
9) Do you think if potassium may cause the following problems?

Cardiac Arrest and Death? ☐ Yes ☐ No ☐ Not known

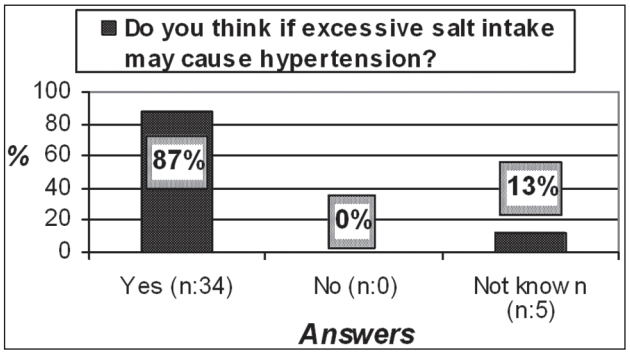
Weakness ☐ Yes ☐ No ☐ Not known



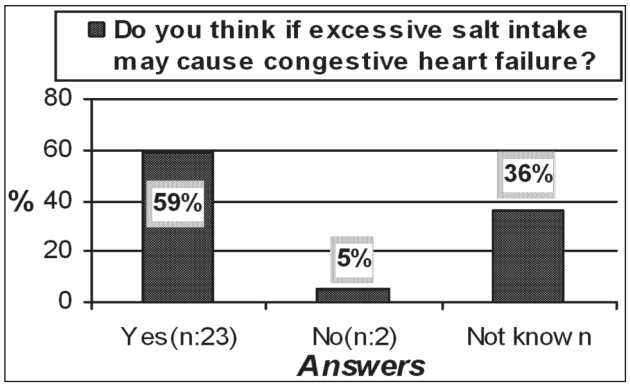
Graphic 1



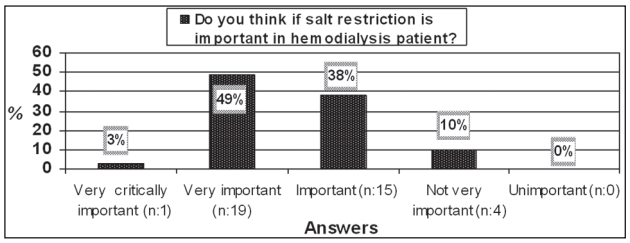
Graphic 2



Graphic 3-a

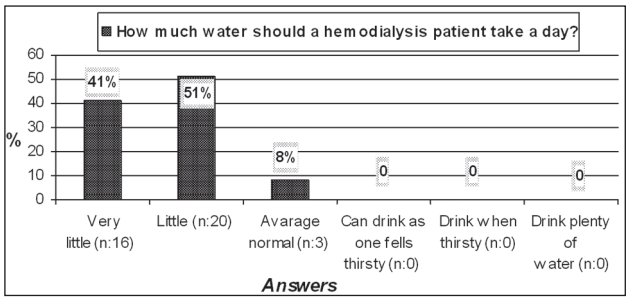


Graphic 3-b



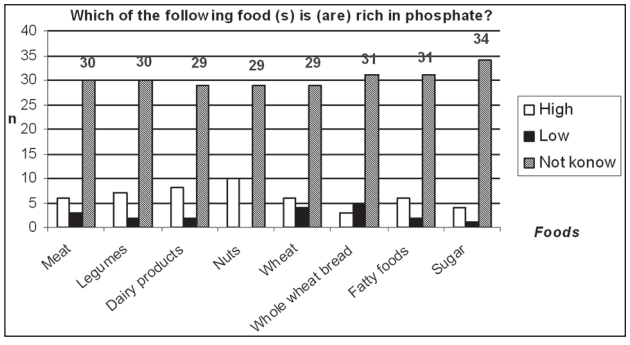
Graphic 4

The relative's answers to questions on the daily fluid needs for the patients having HD were shown in graphic 5.

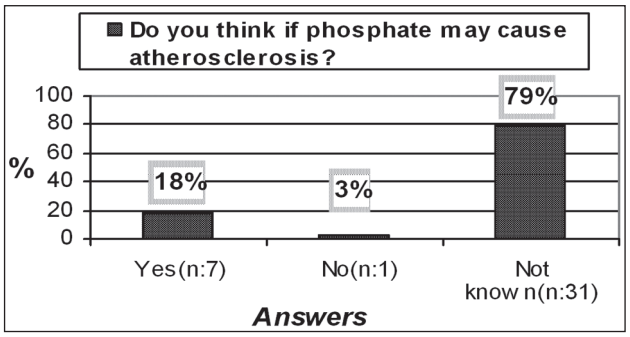


Graphic 5

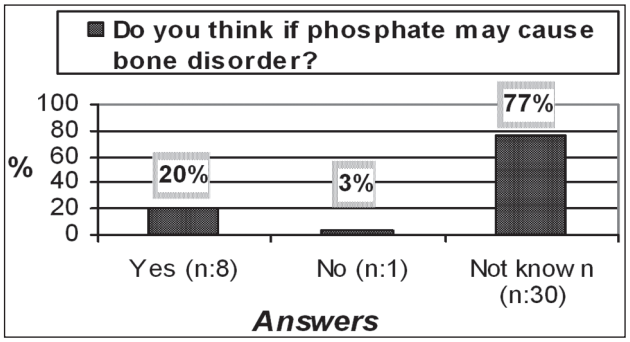
The relative's answers to questions on phosphorus content of foods and phosphor-related problems were summarized in graphics 6 and 7.



Graphic 6. Which of the following food(s) is (are) rich in phosphate?

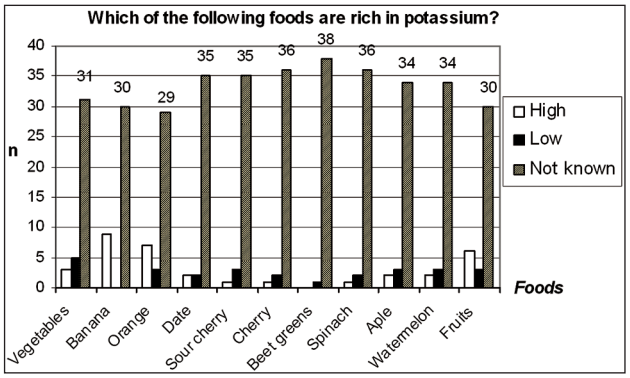


Graphic 7-a

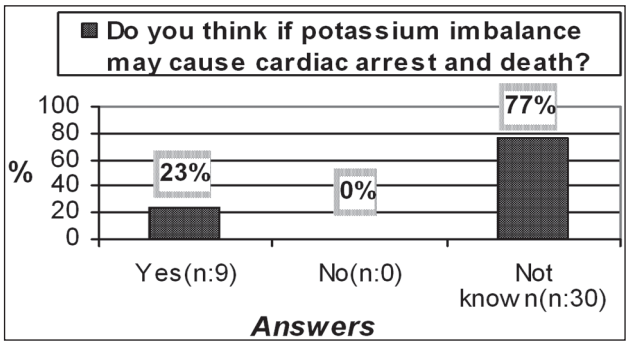


Graphic 7-b

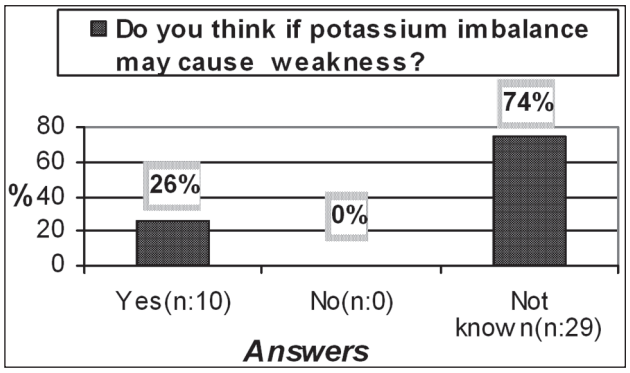
The relative's answers to questions on the potassium content of foods and potassium-related problems were shown in graphics 8 and 9.



Graphic 8. Which of the following foods are rich in potassium?



Graphic 9-a



Graphic 9-b

Discussion

In patients with end stage renal disease (ESRD), interdialytic weight gain, hypertension, hyperpotassemia, bone mineral disorders and mortality can be related to high sodium, potassium and phosphate intakes (1-3). The results of the studies showed that nonadherence of diet and a fluid restriction is a common among hemodalysis patients (4,5).

The diet habit of the patients with ESRD depends on several factors such as the patient's socioeconomic status, their education levels and their life styles (6-8). In Turkey, nutrition dietary education is very important for both the patients and their relatives since the relative's usually provide and prepare the patient's meals. Thus, we investigated the level of nutrition and diet information and the daily dietary practice of the relatives of hemodialysis patients who providing their cares and preparing their meals. As a shortcoming of this study should be noted that, a larger randomized controlled studies are needed to for determine relatives of patients diet information and practices how much influence hemodialysis patients of clinical and laboratory results.

When the relative's answers to the questions on daily salt intake for hemodialysis patients were assessed, the relatives had sufficient information for the salt intake in hemodialysis patient. Total 35 patients were aware the importance of salt avoidance in ESRD; twenty-one patient's relative stated that there was no need to use salt in the meals and fourteen relatives stated that there was enough natural salt in the foods, and no more salt was needed. When the level of information on the salt-related complication in ESRD was assessed, 34 relatives (87%) stated that salt might cause hypertension, and 23 relatives (59%) said that salt might cause congestive heart failure. During the nutrition and dietary education, it should be emphasized that, excessive salt intake may also cause congestive heart failure, and excessive interdialytic weight gain besides hypertension.

The discrepancy between the relative's nutrition information and their daily practice was remarkable. When it was asked to the relatives how much they put salt into the patient's meal; 15 relatives (38%) replied that they put similar amount of salt that they put in their own meal. Only 8 patients (21%) responded that they did not put any salt into the patient's meal. If a patient having HD develops interdialytic excessive weight gain and hypertension, the patient and the relative should be inquired at the same time and it should be asked if the salt is put into the patient's meal. After providing the nutritional and dietary education to the patient and their relatives, they should be followed up periodically to see if they apply their knowledge.

Most of the relatives had sufficient information on water intake in ESRD patients. Thirty-six patient's relatives (92%) replied that the patients with ESRD should drink little or very little water; only 3 patients stated that the patients with ESRD could drink water like normal individual.

The level of relative information for the phosphate and/or potassium containing foods and the phosphate and/or potassium related complications were very limited. When it was asked to the relatives whether the phosphate-rich foods were high in phosphate; the most of them (29(%75)-34(%87)) did not know the answers. The well-known phosphate-rich foods were dried fruits (10 relatives (26%)) and dairy products (10 relatives (26%)). On the other hand, they did not have any information about the other commonly consumed and phosphate-rich foods such as legumes, cracked wheat and meat. Similarly, when it was inquired about the phosphate-related complication, the most common answer was 'I do not know'. Only 7 relatives (18%) were aware that hyperphosphatemia may cause aterosclerosis and 8 relatives (21%) knew that phosphate imbalance may cause bone-mineral disorders.

When it was inquired for potassium-rich foods, the most common answer was 'I do not know' (29(%75)-38(%95)). The best known potassium-

rich foods were banana (9 relatives (23%) and orange (7 relatives (18%)). The most common answer to question about potassium-related clinical problems was 'I do not know'. Only 10 relatives (25%) replied that hyperpotassemia might cause cardiac arrest and weakness.

In terms of the relative's answers to the questions on potassium and phosphate, the patients and the relatives should be educated about the foods rich in phosphate and potassium, and the possible medical complications that may be seen if one takes these minerals excessively.

Conclusion, the nutrition and diet education should be also provided to the patients' relatives. Besides the education, the patients and the relatives should be followed up periodically to see if they apply their knowledge. The relatives especially should be instructed about foods containing salt, phosphate and potassium.

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Three-year epidemiological evaluation of Cutaneous Leishmaniasis in Qom province (2007-2009)

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Abstract

Background: Cutaneous leishmaniasis is an important parasitic disease of tropical and semi-tropical areas of the world. The current study is carried out to evaluate the epidemiology of cutaneous leishmaniasis in Qom province during 2007-2009.

Methods: The study was performed on patients referred to nine health centers in Qom province. The patients were included in the study by random sampling. This descriptive cross-sectional study was performed during 2007-2009. Diagnosis of the disease was based upon the clinical examination and specimens taken from wound serosity, which then underwent Giemsa staining. The demographic data and results of clinical and laboratory evaluations were recorded in patients' datasheet.

Results: From 2007 to 2008, the prevalence of leishmaniasis had a decreasing trend, while it had an increasing trend in 2009. The highest prevalence rates were observed in October and November, and the trend was decreasing in winter. The disease occurred mostly in Iranian males, in the age range of 16-20. In 2007, it was reported mostly in rural population, while in 2008 and 2009, it occurred mostly in urban population. In the years studied, most patients had one lesion in arms, legs, face, and then other regions of the body.

Conclusion: The causes of the higher prevalence of the infection in men above 15 can be attributed to their less covering, and spending more time outdoor for daily activity and work, both of which cause higher probability of contact with sandflies. Authorities should pay attention to the importance and priority of leishmaniasis control, as well as allocating adequate funds for control measures.

Key words: Cutaneous leishmaniasis; Incidence; Qom province.

Introduction

Cutaneous leishmaniasis is a parasitic disease, transmitted by sandflies. The disease has several focal points in different areas of Iran. Based on the statistics of the Iranian Department of Disease Prevention and Control, the prevalence of the disease was 14 cases in 1000 population, and had a decreasing trend in 1987, but it became increasing since 1989. Among the 30 provinces of Iran, rural cutaneous leishmaniasis is endemic in rural areas of 15 provinces. Almost 80% of the cutaneous leishmaniasis is of the rural type (1, 2). It is one of major health and economic problems of many countries including Iran. Currently, 350 million individuals in 88 countries are at risk of the infection, and annually 1.5 million people are infected. Of the cutaneous leishmaniasis cases, 90% are reported from Afghanistan, Algeria, Brazil, Iran, Iraq, Peru, Saudi Arabia, and Syria (3, 4).

Fighting with the disease has been always included in national programs of Iran. However, in spite of national and international investments and attempts, the disease has not been eradicated; rather new focal points are emerging in the country and the prevalence rate is increasing. Therefore, as a major problem, a considerable portion of health and social activities are oriented toward it. Moreover, the disease leads to economic, social, and psychological problems, and consequently brings about irreparable loss for the society. The need for determination of epidemiological characteristics of the disease in focal points is emphasized in the national program for leishmaniasis control. The World Health Organization (WHO) has recommended and supported studies on different epidemiological aspects of the disease (5).

Methodology

The study was performed on patients referred to nine health centers (Imam, Imam Hassan Askari, Al, Jafarieh, Haji Abad, Dastjerdi, Mosque, Central, and Kahak) in Qom province. The patients were included in the study by random sampling. The current study is a descriptive cross-sectional study performed in 2007-2009.

The geographical status of Qom province: Qom city is the only city of the province, and is located in the central part of Iran. According to census 2006, the population of Qom city is 1,040, 681. The surface area and population of the city is equal to those of the Qom province. The province is comprised of five divisions (Jafar-Abad, Khalajestan, Markazi, Salafchegan, and Kahak), 10 borough, and 363 villages. Qom province is the south neighbor of Tehran province. Houz-e Soltan lake is located in Qom province, 40 Km from Qom city. The highest elevation of the province is located 45 km from Qom city in the Fardu region, and the highest peak is called Barf-Anbar peak (3150 m). In cold seasons, the mountain has a glacier with the same name.

Since accurate detailed data on cutaneous leishmaniasis was available from 2007 to 2009, we performed the study on the data of 2007- 2009. The diagnosis was based upon clinical examination and evaluation of specimens prepared from the serosity of suspected lesions. The direct smears were fixed in methanol, underwent Giemsa staining, and microscopically evaluated for Leishman bodies. The demographic data of individuals, such as age, sex, occupation, time of infection, nationality, residency place, number and site of lesions, history of travelling to or living in endemic regions in the past one year, and results of clinical and laboratory evaluation were recorded in patients' datasheet. The data were analyzed using SPSS software with chi-square and t-test.

Results

The numbers of individuals referred to the health centers were 330, 250, and 500 in 2007, 2008, and 2009, respectively. The prevalence rate of leishmaniasis was decreasing in 2008, while it was increasing in 2009. The number of cases diagnosed in 2007, 2008, and 2009 was 247, 128, 415, respectively. According to the results, the prevalence fluctuated from 1 to 18% from April to September, and then the prevalence trend was increasing; such that the highest prevalence was observed in October and November. Then, the trend was decreasing in winter.

The frequency of leishmaniasis with regard to nationality showed that in the study, Iranians (75% of the native individuals without history of travelling to other endemic regions in the past year) and then Afghans had the highest prevalence of the disease. In 2007, the prevalence in Iraqis and Pakistanis were the same. However, the prevalence was higher in Pakistanis in 2008 and higher in Iraqis in 2009. Considering the living place, the prevalence in 2007 was higher in rural population, while the rate was higher in urban areas in 2008 and 2009. In the following diagram, the blue pyramids indicate urban population .

Moreover, it was observed that the prevalence was higher in men (60.8%). Frequency distribution of leishmaniasis in men was significantly higher than that in women ($p<0.001$). Regarding the number of lesions, in 2007 most patients had one, two, and then three lesions, while in 2008 and 2009 most patients had one, three, and then two lesions. Mean results of the three years of the study showed that 35%, 30%, 15%, and 20% of lesions were observed in arms, legs, face, and other regions of the body, respectively.

Most patients were in the age range of 16-20, and then the trend was decreasing from the age of 50. The frequency in the age range under one year was reported to be only 1%. Mean age of the disease was 27.92 years(Table1) .

Discussion

Leishmaniasis is a zoonosis disease transmitted by arthropods (sandfly), and has three forms of cutaneous, visceral, and mixed cutaneous and visceral form. A unicellular flagellate from *Trypanosomatid* family, genus *Leishmania* causes the disease. The parasite is transmitted via bits of sandflies (family *Psychodidae*, subfamily *Phlebotomidae*, genus *Phlebotomus*) from animal reservoirs (mainly rodents, and wild and domestic carnivores) to man. Its symptoms are the lesions, which may remain for one year on the body, face,

Table 1. Characteristics of samples during 2007-2009

Characteristics		2007	2008	2009
Nationality	Iranian	79.8	82.8	86
	Afghans	18.2	14.8	13.5
	Pakistanis	0	1.6	0.2
	Iraqi	2	0.8	0.2
Sex	Male	59.1	63.3	60
	Female	40.9	36.7	40
Birth Location	Urban	40.2	71.9	55.4
	Rural	59.8	28.1	44.6
The number of lesions	1	55	49	57
	2	27	21	19
	More than 3	17	30	25
Age's group	1<	1	1	1
	1-6	6	11	7
	7-10	8	11	7
	11-15	10	15	10
	16-20	13	28	13
	21-30	21	10	18
	31-40	15	11	15
	41-50	12	10	11
	51-60	8	0	11
	61-70	4	1	5
	71-80	2	0	2
	81-90	0	0	0
Month	April	6	3	1
	May	2	3	2
	June	1	2	1
	July	0	3	1
	August	5	3	5
	September	12	9	9
	October	26	17	18
	November	26	20	25
	December	9	8	17
	January	6	15	13
	February	4	10	5
	March	2	5	4

arm, or leg. The site of fly bite and consequently formation of the lesion depends on various factors such as the parasite genus, vector genus, and the epidemiological cycle of the infection.

In Iran, there are two types of cutaneous leishmaniasis; rural and urban. *Leishmania major* is the cause of rural or wet cutaneous leishmaniasis, while *Leishmania tropica* is the cause of urban or dry leishmaniasis. The two forms are the disease are different in the incubation period, the lesion shape, prevalence season, and the disease reservoir (6-9).

In a study in northwest of Kashan region in 1999, the highest prevalence of the infection was reported in the age group 10-20 (34.3%). They could not find a statistically significant relationship between being infected by acute lesions and gender.

Yaghubi et al. reported the prevalence of cutaneous leishmaniasis in a focal point of the rural form in Ardestan to be 4.56%. The disease prevalence was higher in Kashan (6.4%). Ardestan is a region with high prevalence of the disease in Isfahan province. The prevalence of rural cutaneous leishmani-

asis goes under obvious seasonal variations, and the incidence almost reaches zero in March.

The disease in Aran-va Bidgol, in the neighboring of Kashan, is of the rural form. These two regions have similar geographical and ecological conditions. Therefore, it seems that leishmaniasis in Kashan is also of rural form. Further epidemiological studies are required to more accurately determine the type of the disease in Kashan.

In a study carried out in Hosein-Abad Mishmast region in Qom province, the prevalence rates of active lesions and scars were higher than those in Kashan. The disease in Kashan was mostly reported in the age range of 30-39 (19.3%), while in Qom, the rate in the age range of 5-9 was 6.56%. In Qom, the disease occurred as zoonotic cutaneous leishmaniasis (ZCL) epidemic. Moreover, the disease prevalence in Qom province was higher than that in Kashan. Some regions in Kashan (Sansan and Ab-shirin) are close to the contaminated regions and focal points of cutaneous leishmaniasis in Qom. It seems that the incidence of cutaneous leishmaniasis is increasing in central parts of Iran. The incidence rates in the region were 2.7 and 1.4 cases per 100,000 population in 2000 and 2001, respectively (10-14). Another study by Doroodgar et al. showed that the prevalence rate in Kashan was increasing from 2002 to 2007. Moreover, since 75.8% of all patients of the region did not have the history of travelling to other endemic regions, we expect increased rate of disease transmission in the region. The disease incidence was reported to be 37.6 cases per 100,000 population in 2007. In northwest of Kashan region, the rate reached 68.5% from 2000 to 2004 (15, 16).

Epidemiological studies of cutaneous leishmaniasis were first performed in two districts of Harat and Marvast in Khatam town. Evaluation of the disease prevalence demonstrated that all age groups were infected with cutaneous leishmaniasis. Since the disease focal point was new and all individuals were susceptible, the epidemic occurred in the region. So, it is expected to observe the disease in all age ranges and both sexes. The study showed that ZCL became prevalent in Khatam town. It seems that *L. major* was the disease cause (17).

Results of another study on 210 individuals during 2002-2007 in Hamedan showed that the incidence rate of leishmaniasis was 2.05 cases per 100,000 individuals, with the highest frequency in the age range of 15-24. Among the patients, 99% had the history of living in or travelling to endemic regions (18). Some causes of the higher prevalence of the infection in men are their less covering, wandering in deserted areas and deserts, and the higher probability of contact with sandflies in evenings and nights. To select the appropriate host and bloodsucking site, sandflies use chemical and olfactory signals and stimulants. These signals are found mostly in arms and legs.

Males above 15 spend their times outdoor for daily activity and work. Because of higher activity and spending their time outdoor, this age group is at higher risk for fly bite. Because of exposure and continuous contact with the disease, people of higher ages in endemic areas have an acquired immunity against the disease; therefore, the frequency is lower in them. During the activity period of sandflies, the frequency is increasing, but it is decreasing in winter. The people evaluated in the current study were mostly native to the area with no history of travelling to other endemic areas in the past year. Since no effective measured was measured to control the disease, the prevalence rate was fluctuating (ascending and descending).

The disease itself is not that problematic and its lesions usually recover spontaneously. However, considering the socioeconomic and psychological burden of the disease, authorities should pay attention to the importance and priority of leishmaniasis control. They also should allocate adequate funds for control measures. Some measures can be helpful in reducing the vector-human contact; and therefore the frequency of the disease. Some interventions to be mentioned are as follows: cooperation of related organizations, training people about the importance of using insect propellants, insecticides, and insecticide-treated bed-nets, and the way of using them; environmental health activities such as regular garbage pickup and collecting waste from demolition, prevention of animal waste accumulation in rural areas, moving livestock sheds to places outside rural areas, vigilance for diagnosis and timely treatment of the cases, recommending susceptible individuals not to travel or immigrate seasonally to endemic areas, not constructing buildings near animals' habitat, and timely information about the type and prevalence

of the vectors and methods of fighting them. Prevention of complications of infectious diseases, particularly leishmaniasis, requires spending a lot of time and energy, and should be performed in cooperation with health centers and universities. To this end, health messages should also be publicly provided in a timely manner via mass media.

The region evaluated in the study has great potentials for attracting immigrants and pilgrims. Therefore, considering the particular condition of the region, carrying out further systematic and extensive studies on different epidemiological aspects of cutaneous leishmaniasis is suggested.

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Informal caregivers' experiences during hospitalization in Turkey

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Abstract

Objective: The purpose of this study was to determine the informal caregivers' experiences during hospitalization in Turkey.

Methods: The sample was composed of 415 informal caregivers from the medical and surgical units of an university hospital. Data were collected through a demographic data form and the questionnaire about the informal caregivers' problems concerning care giving, informal caregivers' expectations concerning solution of their care giving problems and informal caregivers' opinions about informal care giving.

Results: The results show that most of the informal caregivers willingly stayed with their ill relatives in the hospital. However, they experienced disruption of their family life (31.3%), physical health problems such as tiredness, weakness or pain in all parts of the body 26.2%, psychological health problems such as distress, stress, sadness, anxiety or boredom 21.2%, their financial status and socio-cultural life were affected (5.2%). The informal caregivers considered new arrangements to meet their basic needs as solutions of their problems, and 18.2% of the informal caregivers recommended that they should be provided with a place where they can have a rest and sleep, 12.5% recommended that if education about being ill, illnesses or patient care is offered, their problems can be solved.

Conclusion: The information gathered from this study led us to reevaluate the healthcare services for both patients and informal caregivers to improve physical, psychological, and social life.

Key words: Caregivers; informal caregivers; carers.

Introduction

Informal caregiving is essential to the health of the patients, and without these caregivers, the healthcare system would be unable to meet the needs of chronically ill individuals in Turkey. Informal caregiving is specifically essential and has considerable economic value in countries, such as Turkey, where public service resources are limited (1). In these countries, community-based services may not always be available, accessible or affordable (2).

Informal caregivers provide essential care and support to people with illness and are often key players within recovery. In the context of illness, caregiving is mostly undertaken by the socially significant others of the patients (e.g. parents, spouses, partners, children, siblings and friends) despite existing public services (3). This is consistent with Turkish social structure, where the family is the most important source of support for patients. These people are usually referred as "informal caregivers", given that they are not paid for caregiving. They may partly take the responsibility in the management of the symptoms of the patients' illness and side effects of the treatments, providing personal care, daily asset to the patient, and/or, buffering the emotional impact of their experiences (4).

Informal caregivers are defined as those providing unpaid assistance, such as personal care, bathing, dressing, feeding, help with medications and other treatments, transportation to doctors appointments, arranging for services, and assisting persons with care. Informal caregivers may experience many problems during informal care giving process (5). Potential stressors associated with care giving include the care-receiver's cognitive and functional impairment, behavior problems, and duration of the illness. The informal caregivers constantly face some problems while providing care for their sick family member (6).

Informal caregivers seem to play a role for the well-being of the ill relatives as well. Besides its social and economical input, it has been demonstrated that variables of the informal caregiver, such

as physical health and psychological morbidity (7), the level of practical, emotional (8), and economical burdens (9) in care giving correlate with the physical and psychological well-being of their patients (2,10). However, the individual experience of care giving in low-resource communities attracted little attention. Economics play a role in how informal care giving in hospitals may be needed and demanded in situations in which professional care is lacking.

The caregivers believed that they were expected to help their ill relatives during their hospitalization for 24 hours in the hospital in Turkey. Due to the lack of health personnel, some patient and hospital operations such as patient care, to bring the patient to the examinations (for example ultrasound, tomography etc.), to get the results of the analysis from the different units, to bring the drugs from the pharmacy that are not in the hospital are expected to be made by patients' informal caregivers. Hospital rooms are usually for 4-6 persons and there is not a bathroom or a sofa in the patient rooms in Turkey. Informal caregivers are expected to pay for their stay with a patient in the hospital, and the amount of assistance provided to the patient by informal caregivers appears to be much greater in Turkey than in settings in the European countries. For these reasons, it is important to have informal caregivers be involved in nursing care process. However, it has been observed that there are no arrangements to meet the informal caregivers' basic needs and that the informal caregivers are not offered appropriate training and are not supervised.

The needs and health of informal caregivers are very important for the success of the treatment of the patients. If the caregivers' psychological, emotional, physical, and social needs are well defined and met, informal caregivers may feel more comfortable throughout the hospitalization process and carry out their patients more effectively and consistently. Nursing research on the experiences of informal caregivers is limited in Turkey. This research is expected to be helpful mainly in societies where patients prefer to be cared for by informal caregivers rather than by professionals. The purpose of this research was to identify the informal caregivers' experiences during hospitalization in Turkey.

Method

Study population and measurements

The sample included 415 informal caregivers of patients in a university hospital, in the Mediterranean region in Turkey. The settings were the medical and surgical units at Akdeniz University Hospital. The requirements to qualify as an informal caregiver were that one has to be responsible for caring for the patient throughout the hospitalization process at least 48 hours, to be at least 18 years of age, to be able to speak Turkish, and to give an informed consent to volunteer in this research. Informal caregivers were identified by the researchers as follows: "Informal caregiver is the person who stays with and cares for the patient throughout the hospitalization process at the hospital". This definition was included in the first part of the questionnaire, together with an explanation stating that only caregivers who comply with this definition should fill out the questionnaire.

Data were collected through a demographic and situational data form developed for the study by the authors. The first part of the questionnaire was composed of demographic data questions about carers age, gender, marital status, education level, occupation, employment, degree of relationship with the patient, duration of care giving, income, the degree of patient need for care, who requested care giving. The second part of the questionnaire was composed of three parts: (1) informal caregivers' problems concerning care giving (2) informal caregivers' expectations concerning solution of their care giving problems and (3) informal caregivers' opinions about informal care giving. The informal caregivers were asked to answer some open-ended questions: "How has being an informal carer in hospital affected your life?"; "Have you ever had problems during your hospitalization? If you have had problems, what are they?"; "What do you think of hospital staff's attitude towards informal caregivers?" and "What do you think of and suggest about informal care giving?". All of the participants answered these questions.

Permission to conduct this study was received from the authors' institutional ethical committee. The informed consent was obtained from all study participants in the study. The informal caregivers were informed about the purpose of the study

and what would be expected of them. Participants were assured of their rights of refusal to participate in or to withdraw from the study at any stage without any negative consequences. The confidentiality of participants was guaranteed. As the study design required and some patients were illiterate (4.8%), the questionnaire was administered routinely at face to face interviews. A total of 415 patients' informal caregivers were approached to participate in the study and filled out the questionnaires. There were no incomplete questionnaires at all, nor was any missing information.

Statistical analysis

All items were coded and scored, and the completed questionnaires were included in the data set. All the data were entered, checked for missing values, and analyzed using SPSS Version 13.0 for Windows (SPSS Ltd., Chicago, IL, USA). Descriptive statistics, such as the frequencies, percentages, mean, and standard deviation were used to define the characteristics of the informal caregivers and responses related to the experiences and the main variables.

Results

The socio-demographic characteristics of the informal caregivers are summarized in Table 1. The informal caregivers had a mean age of 41.9 years, 63.4% of the informal caregivers were in surgical units, 36.6% in non-surgical units, , 68.2% were female, 80.0% were married, 47.4% were primary school graduates, 28.0% were high school graduates, 46.3% were a housewife and 69.2% were unemployed. Spouses made up 33.3% of the informal caregivers; daughters or sons (31.3%) were the next most frequent informal caregivers. The mean duration of hospitalization was 14.8 days, 52.5% had an income equal to their expenditures, 61.9% were part dependent, 51.7% willingly requested care giving by themselves and %48.3 of these caregivers were doing so against their will and these informal caregivers requested care giving by patients, doctors or nurses request, 22.7% requested care giving by patients request.

Thirty-one point three percent of the informal caregivers noted that *"their family life greatly changed"*, 14.2% noted that *"their professional*

Table 1. Socio-demographic characteristics of the informal caregivers - continued (n=415)

Socio-demographic characteristics	N	%
Type of Wards		
Non-surgical	152	36.6
Surgical	263	63.4
Age (yrs)		
18-25	56	13.5
26-35	93	22.4
36-45	96	23.1
46-55	103	24.8
56-65	46	11.1
≥66	21	5.1
Mean (SD)	41.9	
Range (18-85)	(14.8)	
Gender		
Female	283	68.2
Male	132	31.8
Marital Status		
Married	332	80.0
Single	60	14.5
Widow/Widower, Divorced	23	5.5
Education Level		
Illiterate	20	4.8
Literate	16	3.9
Primary school	197	47.4
High school	116	28.0
University	66	15.9
Occupation		
Housewife	192	46.3
Retired	58	14.0
White collars	36	8.7
Blue collars	87	21.0
Farmers	17	4.0
Students	6	1.4
No answer	19	4.6
Employment		
Unemployed	287	69.2
Employed	128	30.8
Degree of relationship with the patient		
Spouse	138	33.3
Daughter/son	130	31.3
Parents	59	14.3
Sibling	35	8.4
Daughter-in-law	15	3.6
Other	38	9.1
Duration of care giving (days)	n	%
2-3	89	21.4
4-5	82	19.8
6-7	55	13.3
8-14	62	14.9
15-21	59	14.2
22- over 22	68	16.4
Mean (SD)	14.8	
Range (2-180)	23.6	
Income		
Income equal to expenditures	218	52.5
Income higher than expenditures	55	13.3
Income lower than expenditures	142	34.2
The degree of patient need for care		
Dependent	127	30.6
Part dependent	257	61.9
Independent	31	7.5
Who requested care giving (n=475)*		
Informal caregivers themselves	244	51.7
Patient	108	22.7
Doctor	98	20.6
Nurse	13	2.6
Obligation	9	1.8
No answer	3	0.6

*****Percentages are based on the total number of responses since there is more than one answer.*

life was affected" and 8.7% noted that *"their personal hygiene related needs are not met"*. (Table 2). Five point two percent of the informal caregivers reported that they less frequently participated in social activities and had financial difficulties (Table 2). Some informal caregivers said *"I spend a lot of time with my mum in hospital. I've got a child with Down syndrome, taken care of my sister-in-law and I've got daughter at the school age and is taken care of by one of my neighbors. My husband may start complaining about the situation", "All my family is being affected", "Our life turned topsy- turvy"*. Informal caregivers said, *"Things at work were delayed", "I can't phone people whom I have to call during day time ", "I gave up working since I had to take care of my father in hospital", "Since I couldn't do anything, I had to put up my office for sale", "I had no time to look after plants and trees. Plants died and fruit went bad"*. They commented *"My financial status got poorer", "I can't leave my spouse or go anywhere", "The informal caregivers whose ill relatives need long term care and hospitalized for a long time should not be charged", "We do not contact with almost anyone we know. I don't communicate with anyone", "I have not gone to school for three weeks"*.

The informal caregivers had physical health problems. In fact, 26.2% had tiredness, weakness or widespread body pain, 20.7% had sleeplessness, dizziness, headache or fainting, 7.9% had loss of appetite, nausea, weight loss, constipation and stomach ache (Table 2). The informal caregivers commented *"I had a widespread body pain, I had pain in all parts of my body", "I'm dying for a sleep", "I am so tired that my blood pressure decreases, I become exhausted", "My legs are swollen", "I have had constipation for one week"*.

The informal caregivers had also psychological problems. Twenty-one point two percent had distress, stress, sadness, anxiety or boredom, 5.3% had nervousness, tension or anger, 4.3% had fear, excitement or were affected by other patients (Table 2). They noted, *"We are always worried and stressed out due to health status of not only our ill relatives but also other patients in the ward. I think all carers*

*Table 2. Problems of Informal Caregivers concerning Care Giving (n= 415)**

General problems	N	%
Their family life is affected	130	31.3
Their life at work is affected	59	14.2
Their personal hygiene related needs are not met	36	8.7
Financial and socio-cultural problems	21	5.2
Their education is interrupted	4	0.9
No answer	165	39.7
Health problems	**N**	**%**
Physical health problems		
Tiredness, weakness or pain in all parts of the body	108	26.2
Sleeplessness, dizziness, headache or fainting	86	20.7
Loss of appetite, nausea, weight loss, constipation or stomach ache	33	7.9
Other**	33	7.9
No answer	155	37.3
Mental health	**N**	**%**
Distress, stress, sadness, anxiety or boredom	88	21.2
Nervousness, tension or anger	22	5.3
Fear, excitement or negative effects of other patients	18	4.3
Hopelessness, unwillingness, loss of joy of living or need for support	7	1.7
No answer	280	67.5

**Percentages are based on the total number of responses*

***Other (swollen feet, ecchymosed feet, numbness, increased varicose veins, increased blood pressure, decreased blood pressure, palpitation, arrhythmia, breathlessness, bronchitis, redness and lesions around the navel, herpes zoster infection, herpes simplex infection, allergy, ear and throat pain, hoarseness, influenza, tonsillitis, being irritated with smell of drugs and hospital, urinary tract infection, decreased blood sugar level and burning itchy, painful eyes)*

have as much a difficult time as their ill relatives, their psychology becomes poor", "Being a caregiver means worrying about everything".

Table 3 reveals that the informal caregivers considered new arrangements to meet their basic needs as solutions of their problems. Eighteen point two percent of the informal caregivers recommended that they should be provided with a place where they can have a rest and sleep. They commented, *"We are not robots. We should be offered a place to rest and sleep", "In an armchair for days. It should be kept in mind that informal caregivers are also humans and should be provided with a place to sleep, rest and have a shower", "People from other cities sleep outside, isn't it possible to build a hotel for them near the hospital?".*

In the present study, 12.5% recommended that if education about being ill, illnesses or patient care is offered, their problems can be solved (Table 3). The informal caregivers reported, *"I would have received support while I was assisting the patient to get out of bed and walk and performing a procedure", "I want to receive information about the diagnosis and treatment of the patient from the doctor and I want to receive information about patient care from the nurse. Communication is greatly disrupted due to their heavy workload", "Since the doctors do not offer information about the interventions they performed and resultant problems, we feel that we go through an unknown path. We are already hopeless and we hope to get a remedy. Insufficient knowledge is the biggest problem", "Informal caregivers must be offered education and then they can stay with patients", "The procedures carried out by informal caregivers with no training can give harm to patients. In addition, since we are not offered information after patient visits, we feel uncertainty about the situation. An explanation will make us relieved", "There are deficiencies in training for informal care giving. Things should be explained in detail and patiently".*

In the present study, 9.9% noted that they should not be charged for staying in hospital (Table 3). They complained, *"I paid 5 Turkish Liras (2.5 Euros) daily for one night", "We are charged but we are not offered a place to have a rest and sleep".* Six point seven percent of the informal caregivers recommended that they should be provided with a bathroom and a wardrobe (Table 3). They commented, *"There is only one bathroom and all patients use it, it is not clean, no wardrobe, no place to have a bath. I haven't had a bath for one month. Nobody cares about informal caregivers, as if we did not exist".* Six percent of the informal caregivers in this study recommended that meals should be better (Table 3). They commented, *"Meals are not good, breakfast is awful. They could be better".*

Most of the informal caregivers seemed to have a positive attitude towards informal care giving. Fifty percent of the caregivers noted that they would have a positive attitude if their needs were met and 47.2% had appositive attitude towards the existing informal care system. In our study 70.6% of the informal caregivers found hospital staff's attitude towards them positive. However, 19.0% complained that hospital staff had a negative attitude towards them, 12.2% explained that negative attitude was due to communication problems, 6.3% noted that strict rules were indicative of negative attitude, which was not favorable.

In the present study, 47.2% of the informal caregivers had a positive attitude towards the existing informal care giving system, but 50.4% of the caregivers requested new arrangements to meet their needs. They commented, *"A knowledgeable informal caregiver is the best carer for the patient. If informal caregivers are not allowed in a hospital, then I can't make sure that patients in that hospital have a high morale and receive high quality care", "The informal care giving system is necessary because everybody wants to look after*

Table 3. New Arrangements Recommended by Informal Caregivers (n=415)

Recommended arrangements	N	%
Provision of a place for informal caregivers to have a rest and sleep	75	18.2
Offering education about being a patient, illnesses or patient care	52	12.5
No charging informal caregivers for their stay in hospital	41	9.9
Provision of a separate bathroom and a wardrobe for informal caregivers	28	6.7
Higher quality meals	25	6.0
No answer	194	46.7

their sick relatives", "Informal caregivers provide comfort for patients as if they are at home and help patients to relax", "I feel good and calm because I accompany my mum and I boost her morale", "I'm in favor of informal care giving, but I have pain in my whole body since I sleep on a chair".

In our study, only 2.4% of the informal caregivers had a negative attitude towards informal care giving. They noted, *"It is very difficult to be a caregiver. I don't wish even my enemies become a carer. Even a healthy person becomes ill", "Staying in hospitals under unhealthy conditions has a negative influence on caregivers", "Caregivers do everything nurses have to perform, I have no idea about people who have no relatives", "Caregivers are either first or second degree relatives of patients, we have to take care of our relatives".*

A large percentage of the informal caregivers (70.6%) noted that the hospital staff had a positive attitude towards them. They explained, *"The hospital staff is very polite... As if they have had a special education, they seem to be expert in their own field and well-educated", "Nurses and other health staff are very kind, they are kind even if we sometimes cause trouble", "All the health staff are very patient".*

In the present study, 19.0% of the informal caregivers told that the health staff had a negative attitude towards them and attributed it to communication problems. They explained, *"I think the hospital staff is as unfriendly as those in the court and as tired as miners", "We expect the nurses to show interest. They should be friendly towards patients. They should have a smiling face", "The doctors act as if they were the Prime Minister and it is impossible to talk to them and they never respond, we feel guilty when we ask questions. They may possibly deliberately do it", "Lack of communication makes us worried, decreases the morale of the patients and the informal caregivers, and it is also the job of the informal caregivers to boost morale".*

Discussion

This study revealed the problems, expectations and opinions about informal caregivers staying with their ill relatives in hospitals. The role of informal caregivers has increasingly attracted attention in the literature (10). Most of the research on caregiving concentrated on different population in Western countries. However, the informal caregivers' experiences of caregiving in low-resource communities attracted little attention. The role of informal caregiver is essential especially in countries with low healthcare resources (11). In Turkey, despite the pivotal role of informal caregiving, data on this phenomenon are scarce. Our study introduces the first results of caregiving experience during hospitalization in Turkey.

Hospitalization of a family member leads to changes in the whole family life and affects daily life activities and life styles of families. The care giving experience is a complex phenomenon. It affects all aspects of the caregiver's life, including his or her physical, emotional, and psychological health [12]. In this study, the informal caregivers commented that their family life, work life, financial status were greatly affected, and they had fewer social relationships (Table 2). Care giving also can result in economic problems for informal caregivers. Emanuel and collegues (3) surveyed 988 terminally ill patients, 52% of whom had cancer, along with 893 primary caregivers. Identified needs of these patients included transportation, nursing care, homemaking, and personal care. Caregivers of patients with substantial care needs were more likely to report greater economic problems (3). Care giving may lead to financial problems because of reduced income from paid work and the expenses that need to be made in the context of providing informal care (13).

The present study also revealed that informal caregivers experienced various physical health problems (Table 2). In a study by Bayat and collegues (14), out of all care giving mothers who noted that their physical health was affected, 28.5% had headache, 24.1% had a low back pain, 22.4% had a foot and joint pain and lower percentages of the informal caregivers had upper respiratory tract infections, palpitation, hypotension and urinary tract infections. Actually, informal caregivers health and well-being have an influence on their ill relatives. Gallego and collegues (15) indicated that caring had effects on the health of the carer and that the health problems which most frequently occurred were backache (73%), reduction of leisure time (73%), tiredness (72%), sleep disturbance (65%) and disturbance of family life (54%).

In the present study, the caregivers had psy-

chological problems as well (Table 2). Caregivers may experience physical symptoms, anxiety, depression, restrictions of roles and activities, strain in marital relationships, and diminished physical health (16,17). Physical morbidity was associated with caregiver depression, social support, patient problem behaviors, and cognitive impairment (18,19). As shown in Table 3, the informal caregivers believed that new arrangements to meet their basic needs could help solve their problems. Lack of a place to sleep in the most hospitals causes tiredness and exhaustion among caregivers. Caregivers who are sleepless and tired and have not had a shower have to take care of their ill relatives.

Research demonstrated that individuals would have liked to have been provided with a set of information on the illness, treatment, and care (20). Client education is an important and independent aspect of nursing. Client education contributes to promoting the self-care of patients, preventing complications, and reducing risk factors for an individual's health (21). Being uninformed about one's own state of health and environment can cause the person to feel powerless and helpless. In such a case, the individual may deny the situation and perceive reality as threatening (22). Thus, seeking information can be a coping strategy for the individual to take control of the situation. In another study, the informational need was also identified as the primary area of concern for informal caregivers (23). In the present study, some informal caregivers recommended an education about illnesses and patient care (Table 3). An important way of supporting families is to inform them. The content of an education program for informal care giving should be determined based on the capacity of caregivers to understand and patients' health problems. Informal caregivers offered appropriate education can facilitate home care after patients are discharged. Nurses should provide support for patients and their relatives (24). Attree (25) in a qualitative study reported that a good nursing care refers to the care in which an open communication focusing on patients and their relatives is adopted and patients' and their relatives' knowledge is taken into account. It has been observed that many health care centers do not have guidelines for education and supervision of informal caregivers although informal care giving is frequently utilized.

Informal caregivers mostly do not want more than a chair. However, existing resources of hospitals should be used and appropriate arrangements should be made in hospitals to meet caregivers' needs for eating, sleeping, bathing and hygiene. In the present study, half of the informal caregivers had a positive attitude towards the existing informal care giving system, but half of the informal caregivers requested new arrangements to meet their needs. Informal caregivers should stay in the hospital for an adult inpatient and also need to pay for their stay. Nevertheless, it was also interesting that many of the participants had positive attitude about their caregiving even if they had to stay in the hospital in somewhat difficult environment. Turkish culture much influences these results. These data have great potential for discovering new knowledge about the family context of caregiving in Turkey.

Informal caregivers have needed more support from nurses. Some difficulties in communication between nurses and caregivers may arise. An effective communication may not occur since nurses do not have enough time and since caregivers are quite shy. The context of caregiving differs across geopraphic and cultural boundaries. In Turkish society, informal caregivers play a major role in the treatment of patients because of the Turkish cultural expectations and obligations. In Turkey, informal caregivers of patients were mostly spouses, some family members and other relatives. This is consistent with Turkish social structure, where the family is the most important source of support for patients. The attitude and behavior of people toward disease is developed in the light of knowledge presented to them by the cultural environment in which they were born. Turkish family units are extremely important in traditional Turkish culture, and our caregivers are very much affected by the family structure. In Turkish culture, all the family members support each other both in the extended and when a family member falls ill and needs support. Any member of the family may serve as an informal caregiver. It is well known that illness affects psychosocial adjustment in the family and increasing attention is focused on the informal caregiver. Patients require varying degrees of assistance with activities of daily living throughout the course of their illness. Assistance may be needed

in personal care, meal preparation, housekeeping, shopping, transportation, completion of insurance forms and obtaining financial and legal advice (26). In addition, many other household activities can be managed at the same time while taking care of patients at home. The informal care giving is very interesting, and it is important to understand how this unique caregiving context might require a study of this population to understand the nature of informal caregiving in Turkey. The impact of in hospital caregiving on financial status and physical health seems to be significant in Turkey. The context of caregiving among families with a member in a Turkish hospitals appear to be unique, compared to that in European society.

Informal caregivers play an important role in patient care in Turkey. An investigation into problems of informal caregivers, their expectations, concerning solution of their problems and their opinions about informal care giving can contribute to efforts to increase health professionals' awareness in the issue and to improve services to meet their needs.

The group of informal caregivers selected in the research period, which were unselected for illness type or stage. The characteristics of care-receivers are not known. The generalisability of these results to other informal caregivers is unknown. These were limitations of our study. However, further studies with a bigger sample is needed to explore the educational and counselling role of nurses, in particular to those informal caregivers who are inexperienced in care giving. Additional research should involve a careful examination of the impact of race, ethnicity, and culture on constructs commonly used in caregiving research.

Conclusions

Most of the informal caregivers were found to have a positive attitude towards informal care giving as far as their needs were met in Turkey. In fact, we found that physical and mental health status of informal caregivers was affected and their basic needs were not sufficiently met. Therefore, nurses should be as sensitive towards informal caregivers' needs and problems as patients' needs and problems. Hospitals should be arranged to meet carers' basic needs and to this end, guidelines should be issued. It is clear that more work is needed in educating health care professionals in health care settings about the negative impact of the demands placed on informal caregivers. We think that the results of our study will increase awareness of health staff in carers' needs and contribute to efforts to meet their needs. The findings of this study an initial understanding of informal caregivers' difficulty in providing hospital care for informal caregivers with patients in Turkey. This knowledge can be used by the caring professionals to plan nursing assessment, support, counsilling and education to informal caregivers. It is suggested that special attention should be paid to the caregivers' difficulties in recovery of personal time. Early interventions, including education about alternative coping strategies and practical information, might give informal caregivers better opportunities to continue caring with less negative effects on their lives.

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Use of 24-hour urinary calcium for prediction of preeclampsia

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Abstract

Background: Pregnancies with preeclampsia have higher rates of preterm labor, small for gestational age and neonatal intensive care unit admission than normotensive pregnancies. The purpose of this study was to assess the efficacy of 24-hour urinary calcium for the prediction of preeclampsia.

Materials and methods: One hundred fifty normotensive women at 20–26 weeks' gestation were enrolled in the study. All women were asked to collect a 24-hour urine sample. Urinary calcium were measured and expressed as milligrams per 24 h. The efficacy of 24-hour urinary calcium for the prediction of preeclampsia were assessed.

Results: Sixteen of the 150 women developed preeclampsia, including six who developed severe preeclampsia and 10 who developed mild preeclampsia. Compared with the normotensive women (n=134), the hypertensive patients (n=16) had significantly lower urinary calcium excretion (165.30±78.53 mg vs. 265.40±58.41 mg).

Conclusions: A decrease in 24-hour urinary calcium between 20 and 26 weeks' gestation is a risk factor for preeclampsia.

Key word: preeclampsia; 24-hour urinary; calcium

Introduction

preeclampsia, a hypertensive disorder of late pregnancy accompanied by edema and proteinuria, and characterized by vasospasm and coagulation abnormalities, is still a leading cause of maternal and fetal morbidity and mortality. (1-4) The incidence of the disease is as high as 17% in the general population. (5) The disease occupies the same prime position as it did nearly 50 years ago Preeclampsia is characterized by endothelial damage and a marked increase of peripheral vascular resistance, although the pathophysiologic mechanisms that underlie this reversible form of human hypertension still remains to be elucidated.(1)

Despite an intensive research effort to elucidate the origin of preeclampsia, there is currently no well-validated prophylactic treatment, nor is there any effective method of identifying women at risk for preeclampsia. Therefore, currently, the utility of predicting risk for the disease lies in being able to reduce that risk. Prediction of risk will identify patients for more careful monitoring but may also identify a population that is highly suited for research into the etiology of preeclampsia and for potential treatment and prevention of disease.(6) Recent studies have suggested that preeclampsia is associated with hypocalciuria.(1,7) In preeclampsia both renal perfusion and GFR are decreased and plasma uric acid and urina. Ry sodium are increased, whereas urinary calcium excretion is decreased because of increased tubular reabsorption. It has been suggested that these changes may be determined before clinical disease manifests.(6)

The present study was performed to evaluate the values of 24-hour urinary calcium measurements as a suitable marker for early detection of preeclampsia.

Materials and Methods

The study group consisted of one hundred and fifty normotensive nulliparous pregnant women attending the prenatal care centers in Sari, Iran. The women were enrolled at 20–26 weeks' gestation and followed up until delivery. excluded cariteria of the samples was included these cases: all the woman under 20 and beyond 35 years, smoking and addicted women, multiple pregnancy, hemoglobin < 8 g/dL, suffering from known physical and mental diseases including all heart, renal and immune diseases, all kinds of cancers, hepatitis and diabetes mellitus.

Informed consent was obtained from all women. Routine investigations, along with measurements of blood pressure, 24-hour urinary calcium and maternal weight, were performed at the time of enrolment. Symptoms and Signs of preeclampsia were evaluated in every prenatal care visit. After delivery, the charts were reviewed for the presence of preeclampsia and gestational hypertension. The efficacy of 24-hour urinary calcium for the prediction of preeclampsia were assessed. The demographic characteristics collected in questions were taken and analyzed by SPSS (independent sample t-test and $\chi 2$). Statistical significance was defined as $P<0.05$.

Results

Our study was included parturients from October 1, 2007 to December 30, 2008 in prenatal care centers in Sari, Iran. 150 normotensive nulligravidas women were enrolled in this study. Sixteen of the 150 women developed preeclampsia, including six who developed severe preeclampsia and 10 who developed mild preeclampsia.

There was no significant difference in age, hemoglobin, body mass index at enrollment between the two groups (normotensive and preeclampsia).

The hypertensive patients (n=16) had significantly lower urinary calcium excretion (165.30±19.758 mg vs. 265.40±3.302 mg [P<0.000])

Conclusions

The findings resulted from this study showed that two groups had statistically significant difference in the average of 24-hour urinary calcium in early pregnancy and the hypertensive patients (n=16) had significantly lower urinary calcium excretion (165.30±19.758 mg vs. 265.40±3.302 mg [P<0.000]). We found that low urinary calcium was a risk factor for preeclampsia cutoff points.

Suarez (et al) noted in young, apparently healthy primigravidas, a low urinary excretion of calcium per kilogram of body weight per 24 hours before the end of the first half of gestation is a risk factor for preeclampsia, with an acceptable sensitivity and high negative predictive value, but with a positive predictive value no better than chance. (8) This result is in coordination with our research results. Phuapradit (et al) showed that The patients with preeclampsia did not have significantly less excretion of calcium than the normotensives.(9)

Roelofsen (et al) demonstrated that there not any difference urinary calcium excretion in normal and complicated pregnancies women.(10) This study results do not have any coordination with the present research results. Roelofsen (et al) measured urinary calcium excretion in normal and complicated pregnancies but in present study, we measured urinary calcium excretion in normotensive women at 20-26 weeks' gestation.

Sanche (et al) noted Women who develop preeclampsia during pregnancy excrete less calcium than healthy pregnant women. Whether this reduction in calcium excretion precedes or follows hypertension is unknown. their observation suggest a pathophysiologic role for altered urinary calcium excretion in women with preeclampsia that may contribute to the early identification of patients at risk for this disease.(11) McGrowder(et al) suggest that hypocalciuria in preeclampsia is associated with decreased fractional excretion of calcium, suggesting a mechanism which may involve increased tubular reasorption of calcium.(12)

Tolaymat (et al) showed that despite the indirect evidence of others, calcium absorbtion does not appear to be impaired in patients with preeclampsia. The retention site of the unexcreted calcium is undentified.(13)

A decrease in 24-hour urinary calcium between 20 and 26 weeks' gestation is a risk factor for preeclampsia. Identify subclinical disease before

Table 1. Demographic and laboratory charactristics in normotensive and preeclampsia patients

Demographic Characteristic	normotensive(n=134)	preeclampsia(n=16)	P-valu
Age (years, mean[SD])	24.25 ± 2.38	23.63 2.50±	0.479
Body mass index (mean[SD])	26.321.36±	26.69 1.53±	0.319
Hemoglobin (g/dl)	12.86 ± 1.49	12.96 1.34±	0.808
24-hour calciuria (mg/24 hour)	265.403.302 ±	165.3019.758±	0.000

the maternal manifestations are evident and allow intervention before having to resort to delivery of the patient.

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Factors affecting the knowledge levels of a group of university students about the protection ways against breast and testicle cancer

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Abstract

This study was made as a descriptive study to determine the factors affecting the knowledge levels of a group of university students about the protection ways against breast and testicle cancer.

The universe of the study was formed by 256 students who were getting education in a private college located in the Asian side of Istanbul and taking a selective health and life class in this institution. Before the selection of the sample the universe of the study was studied on, but due to the fact that some students did not want to participate in the study, 177 (%69.1) students were included in the study sample. Data were obtained by the demographic data survey and "breast and testicle cancer and protection ways survey". Study surveys were applied between February-May 2011 and verbal participation consent was taken from the students. Data were evaluated by percentage calculations, Kruskal Wallis test and t-test.

%66.7 of the students were in the 18-20 age group and %53.7 of them were male. %95.5 of the students stated that they have heard of breast cancer before and %68.4 of them stated that they have heard of testicle cancer before. %24.9 of the students stated that they have a family member with breast cancer, %30.5 of them stated that they were informed about the breast self-examination (BSE) and testicle examination (TE) and %57.1 of them stated that they have no information about the application of BSE and TE. %74 of the students stated that they have never done BSE and TE before and %68.4 of them stated that they wanted to learn about BSE/TE. Breast and testicle cancer and protection ways survey mean score of the students was found as 38.08±19.97. There is statistically significant difference was found between the genders, having a family member with breast cancer status, being informed about BSE and TE status, doing BSE and TE status and the knowledge level mean score of the students ($p<0.05$).

Key words: Breast cancer, testicle cancer, breast self-examination, testicle examination, students, knowledge level.

Introduction

One of the major health problems threatening the human health nowadays is cancer. Among the most frequently-seen types of cancer in women, breast cancer comes out in top. %23 of the types of cancer seen in moman is formed by breast cancer. While the breast cancer frequency increases %0.5 in each year in the world, approximately one million women are diagnosed with cancer in each year. Testicle cancer is one of the health problems with a gradually-increasing frequency nowadays. Testicle tumors are the second most-common malignancy after leukemia in the males between the 20-35 age group. Testicle cancer can be cured if it is diagnosed in its early stages. 5-year survival rate is %99 with early diagnosis (Lechner et al., 2002; Duran, 2008; Porter, 2008; Gocgeldi and Kocak, 2010).

Breast self-examination (BSE) has an important part in the early diagnosis of breast cancer. In literature, it is stated that in %90 of the breast cancer cases, the patient himself/herself notices the breast cancer (Simsek and Tug, 2002). After 20 years of age, BSE is a kind of examination which should be done by every woman. BSE, is an easily-applied, economical, safe, non-invasive type of examination with no special tool requirements for every woman, it takes only about five minutes and it is an effective early diagnosis method for breast cancer (Nahcivan and Secginli, 2003; Uzun et al., 2004).

TC is one of the treatable type of cancers, its prognosis is quite good if it is diagnosed early and its 5-year survival rate is %99 in the I. stage (Lechner et al., 2002). Reasons for being late in the di-

agnosis and treatment are listed as young males not knowing the danger of TC and the important method of Testicle Self-Examination (TSE) for early diagnosis, not caring about the examination due to feelings like guilt and sin, and being late to consult a physician in this matter. For this reason, it is quite important for the early diagnosis of TC

for males between 15-35 years old to make this examination at least once a month while taking a bath or a shower. TSE is a simple method with no cost (Ercan, 2006; Yilmaz et al., 2009; Gascoigne and Whitear, 1999; Daley, 2007).

University students may see BSE and TSE as unnecessary. In the studies made among young people, it was found that young people have no information about the high frequency of breast cancer and testicle cancer cases in their age groups, they have no information about the general symptoms of the disease and they have almost never made BSE and TSE. It is quite important to make young people learn about BSE and TSE applications to make them aware of the breast and testicle cancers and to help their health improvement behaviors. Young people should be informed about the necessity and the application of BSE and TSE because this education is one of the important steps for young people to adopt health protective behaviors and take responsibility in the aspect of their health (Aydin, 2004; Ercan, 2006; Yilmaz et al., 2009, Beydag and Yurugen, 2010).

This study was made as a descriptive study to determine the factors affecting the knowledge levels of a group of university students about the protection ways against breast and testicle cancer.

Materials and Methods

The universe of this descriptive type of study was formed by 256 students who were getting education in a private college located in the Asian side of Istanbul and taking a selective health and life class in this institution. Before the selection of the sample the universe of the study was studied on, but due to the fact that some students did not want to participate in the study, 177 (%69.1) students were included in the study sample. Students included in the study were informed before the study and their verbal consent was taken.

Data collection tools

Data were obtained by the socio-demographic data survey which consisted of 18 questions about the and "breast and testicle cancer and protection ways survey" which consisted of 20 questions BSE and TSE applications. First ten questions in the knowledge survey were related to the knowledge of breast cancer, and the remaining ten questions were related to the knowledge of testicle cancer. Answers of the questions in the knowledge survey were prepared as "true", "false" and "i don't know" and each true answer was calculated as five points. The score of the knowledge survey was between 0 (zero) at least and 100 (one hundred) at most. The interpretation was that the higher the score, the higher the knowledge level was.

Procedure and data collection

Study surveys were applied between February-May 2011. Survey was given to the students to be filled, and an observer was present by the students while they were filling out the survey. Survey application time was determined as 3-5 minutes, and after the application of the survey, students were informed about the answers of the survey questions. Data were evaluated by percentage calculations, Kruskal Wallis test and t-test.

Findings

Demographic features of the students included in the study are shown in Table 1. It was determined that %66.7 of the students were in the 18-20 age group, %53.7 of them were male and %17.5 of them had no social security. %30.5 of the students stated that they sometimes noticed the changes related to their health, %78.5 of them stated that they wait for a while and monitor in case of a change and %18.1 of them stated they had a health problem requiring treatment

Knowledge and applications of the students included in the study for breast cancer and testicle cancer are shown in Table 2. %95.5 of the students stated that they have heard of breast cancer before and %68.4 of them stated that they have heard of testicle cancer before. It was determined that %24.9 of the students had a family member with breast cancer, %5.6 of them had a family member

Table 1. Demographic features of the students (n:177)

Variables	Number	Perc. (%)
Age groups		
18-20 age	118	66.7
21 age and over	59	33.3
Gender		
Female	82	46.3
Male	95	53.7
Social security type		
Social security institution (SSI)	146	82.5
None	31	17.5
Noticing the health changes status		
I always notice	123	69.5
I sometimes notice	54	30.5
What he/she does in case of a change		
Immediately goes to a health care institution	21	11.9
Wait for some time, monitors	139	78.5
Does nothing	17	9.6
Having a health problem requiring treatment status		
Has a health problem	32	18.1
Does not have a health problem	145	81.9
Total	**177**	**100.0**

with testicle cancer and %6.8 of them had health problems related to breast/testicle cancer before. %57.1 of the students stated that they had no information on making BSE/TSE, %69.5 of them stated that they were not informed about BSE/TSE and %74 of them stated that they have never made BSE/TSE before. %55.9 of the students stated that they had no information on how to make BSE/TSE and %68.4 of them stated that they wanted to be informed about BSE/TSE.

Comparison of the mean scores of the students according to their gender is shown in Table 3. A statistically significant relationship was found between the genders of the students and their mean scores ($p<0.05$). In this study in which the mean scores of the male students were found to be higher than the mean scores of the female students; it was seen that the knowledge levels of the female students about breast cancer were higher and the the knowledge levels of the male students about testicle cancer were higher.

Comparison of the mean scores according to students having someone with breast cancer in their families or close environment is shown in Table 4. A statistically significant difference was found between the mean scores of the students and their status of having someone with breast cancer in their families or close environment ($p<0.05$). Mean scores of the students who had someone with breast cancer in their families or close environment was found to be higher than the others.

Comparison of the mean scores of the students according to them being informed about BSE/TSE and making BSE/TSE status is shown in Table 5. A statistically significant difference was found between the being informed about BSE/TSE status and making BSE/TSE status of the students and their mean scores ($p<0.05$). While the students who were informed about BSE/TSE were found to have higher mean scores; the mean score of the ones who had never made BSE/TSE was found to be lower than the others.

Discussion

In this study which was made to determine the factors affecting the knowledge levels of a group of university students about the protection ways against breast and testicle cancer, %69.5 of the students stated that they always notice changes about their health, %78.5 of them stated that they wait for a while and monitor in case of a change and %18.1 of them stated they had a health problem requiring treatment (Table 1). In the study

Table 2. Knowledge and applications of the students for breast cancer and testicle cancer (n:177)

Variables	Number	Perc. (%)
Hearing about the breast cancer before status		
Have heard	169	95.5
Have not heard	8	4.5
Hearing about the testicle cancer before status		
Have heard	121	68.4
Have not heard	56	31.6
Having someone with breast cancer in family or close environment status		
Yes	44	24.9
No	133	75.1
Having someone with testicle cancer in family or close environment status		
Yes	10	5.6
No	167	94.4
Having a health problem related to breast/testicle cancer before status		
Had	12	6.8
Did not have	165	93.2
Knowing how to make BSE/TSE status		
Knows	76	42.9
Does not know	101	57.1
Being informed about BSE/TSE status		
Informed	54	30.5
Not informed	123	69.5
Making BSE/TSE status		
Always	5	2.8
Sometimes	41	23.2
Never	131	74.0
Reason for not making BSE/TSE		
Makes the examination	42	23.7
Does not know how to make the examination	99	55.9
Thinks it is not necessary	25	14.1
Afraid in case something bad may come up	11	6.3
Wanting to be informed about BSE/TSE status		
Wants to be informed	121	68.4
Does not want to be informed	35	19.7
Undecided	21	11.9
Total	**177**	**100.0**

Table 3. Comparison of the mean scores of the students according to their gender (n:177)

Gender	n	X ± sd	Statistical test p
Female	82	38.04±16.32	**t:** 2.829 **p**:0.009
Male	95	38.05±22.74	
Total	**177**	**38.08±19.97**	

Table 4. Comparison of the mean scores according to students having someone with breast cancer in their families or close environment (n:177)

Having someone with breast cancer in family or close environment status	n	X ± sd	Statistical test p
Yes	44	39.88±16.01	**t:** 2.319 **p**:0.003
No	133	37.44±21.13	
Total	**177**	**38.08±19.97**	

Table 5. Comparison of the mean scores of the students according to them being informed about BSE/TSE and making BSE/TSE status (n:177)

Being informed about BSE/TSE status	n	X ± sd	Statistical test p
İnformed	54	45.74±16.72	**t:** 3.501
Not informed	123	34.67±20.40	**p**:0.001
Making BSE/TSE status			
Always made	5	51.00±11.40	
Sometimes made	41	43.04±16.76	**KW:** 7.143
Never made	131	35.99±20.75	**p:**0.028
Total	**177**	**38.08±19.97**	

made by Ercan (2006), %65.7 of the students stated that they always notice changes about their health, %78.8 of them stated that they wait for a while and monitor in case of a change and %26.6 of them stated they had a health problem requiring treatment (Ercan, 2006). In the study made by Yilmaz et al. (2009), %61.8 of the students stated that they always notice changes about their health, %61.8 of them stated that they wait for a while and monitor in case of a change and %21.8 of them stated they had a health problem requiring treatment (Yilmaz et al. 2009). These findings show that students know their bodies, they notice the changes in their bodies, they care about themselves and they act in a controlled way when it comes their health.

%95.5 of the students included in the study stated that they have heard of breast cancer before and %68.4 of them stated that they have heard of testicle cancer before. It was determined that %24.9 of the students had a family member with breast cancer, %5.6 of them had a family member with testicle cancer and %6.8 of them had health problems related to breast/testicle cancer before. %57.1 of the students stated that they had no information on making BSE/TSE, %69.5 of them stated that they were not informed about BSE/TSE and %74 of them stated that they have never made BSE/TSE before. %55.9 of the students stated that they had no information on how to make BSE/TSE and %68.4 of them stated that they wanted to be informed about BSE/TSE (Table 2). It is such a sad finding that young people in their 20s who are getting university education have no information about the most important early diagnosis methods, BSE and TSE, for breast cancer and testicle cancer, respectively. There are studies in literature with similiar results compared to the study finding. In the study made by Aydin (2004), %62.5 of the students stated that they had no information on how to make BSE/TSE (Aydin, 2004). In the study made by Beydag and Yurugen (2010), it was found that %58.3 of the female students had no information about breast examination, %73.8 of them never made BSE and %53.4 of them had never made breast examination due to not knowing how to do it (Beydag and Yurugen, 2010). In the study made by Gocgeldi and Kocak (2010), %48.3 of the young males stated that they have never heard of testicle cancer, %20.7 of them stated that they have heard of TSE, %8.8 of them stated that they made TSE at least once in their lives (Gocgeldi and Kocak, 2010). In the study made by Yilmaz et al. (2009), it was found that %60.9 of the male students getting health education had heard of TC before, %40 of them had heard of TSE before, %25.5 of them had information related to TSE and %92.7 of them wanted to be informed about TC and TSE (Yilmaz et al., 2009). On the other hand, in the study made by Ward et al. (2005), it was found that %27 of the adolescent group had never heard of testicle cancer before (Ward et al., 2005). In the study made by Ercan (2006), %93.3 of the students stated that they wanted to be informed about testicle cancer and its self examination (Ercan, 2006). In the study made by Yilmaz et al., it was determined that %60.8 of the students wanted to be informed about TC and TSE (Yilmaz et al., 2009). In the studies made about TSE, not knowing how to do the examination comes as the first reason among the reasons for not making TSE (Ercan, 2006; Yilmaz et al., 2009).

A statistically significant difference was found between the genders of the students and their mean scores ($p<0.05$) (Table 3). In this study in which

the mean scores of the male students were found to be higher than the mean scores of the female students; it was seen that the knowledge levels of the female students about breast cancer were higher and the the knowledge levels of the male students about testicle cancer were higher. This result is thought to have originated from the fact that the number of the male students was higher than the number of the female students. In the distribution of the mean score, the finding which was stated as the knowledge levels of the female students about breast cancer were higher and the the knowledge levels of the male students about testicle cancer were higher shows that students have not enough knowledge about the type of cancer which affects the opposite gender. In order for university students to be informed about breast and testicle cancers, which are a threat for every gender, and know about their early diagnosis methods, more young people must be informed about these topics with the peer education. For this reason, it is thought that students in both genders should be informed both types of cancer and their early diagnosis.

A statistically significant difference was found between the mean scores of the students and their status of having someone with breast cancer in their families or close environment ($p<0.05$) (Table 4). Mean scores of the students who had someone with breast cancer in their families or close environment was found to be higher than the others. It is thought that the students who had someone with breast cancer in their families or close environment knew about breast cancer because they saw the progression of the disease and the things happen in this process. In the study made by Tasci (2008), a statistically significant relationship was found between having someone with breast cancer in the family and knowin the risk status of themselves related to breast cancer, and them knowing and making BSE (Tasci, 2008). This result support the study finding.

A statistically significant difference was found between the being informed about BSE/TSE status and making BSE/TSE status of the students and their mean scores ($p<0.05$) (Table 5). While the students who were informed about BSE/TSE were found to have higher mean scores; the mean score of the ones who had never made BSE/TSE was found to be lower than the others. It is known that the education given to the individuals is effective at removing this lack of knowledge and correcting the false knowledge. This result shows that education is effective in the increase of knowledge. In the study made Tuna (2002), A statistically significant relationship was found between the BSE making frequency and the knowledge level and it was also found that the ones who were making their BSE on a regular basis had higher level of knowledge compared to others (Tuna, 2002). In the study made by Parlar, Bozkurt and Ovayolu (2004), it was stated that the knowledge level of the people who were making BSE was better (Parlar et al., 2004). In the study made by Gok, Ozer, Beydag and Ozbay (2009), it was determined that BSE making status is effecting the knowledge level and the knowledge levels of the students making BSE was found to be higher (Gok Ozer et al., 2009). In the studies made by Ercan (2006) and Yilmaz et al. (2009), the true answer giving rates for the questions related to TSE of the students who stated that they were informed about testicle cancer before was found to be better than the true answer giving rates of the students who stated that that they were not informed about testicle cancer before (Ercan, 2006; Yilmaz et al., 2009). These results support the study results.

Implications

Suggestions made in the light of these results are;

University students should be informed about the symptoms of the breast and testicle cancer for both genders, they should be informed about the importance of BSE and TSE for the early diagnosis of these diseases, educational programmes should be planned for teaching students how to apply these methods and young people should be encouraged to make BSE and TSE,

Students with no health education should be put in an interaction with their peers with the peer education model and all of the students in the university should be reached,

In the health class which is included in educational programmes as a selective course, breast cancer and testicle cancer, and BSE and TSE subjects should be included.

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Maternal obesity and pregnancy outcome

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Abstract

The present study is aimed to determine the pregnancy outcome in fatty women.

This study was done on pregnant women that referred to prenatal care center. Incidence of the pregnancy and fetal outcome increases in women with high level of weight gain. Women with high BMI before pregnancy should lose their weight because if they get pregnant with high BMI, they would be considered as high risk pregnant women.

Key words: Pregnancy, BMI, obesity, High level weight gain, Pregnancy Outcome.

Introduction

A lot of researches considered the importance of BMI and variation of weight gain during pregnancy period. Abnormal weight of mother is very important complication that can affect the reproductive health. Prevalence of obesity is 7-46%. 20-30% of American women have 20% over weight. (14)

According to National Health and Nutrition in 1999-2002, 65% of population are fat or have over weight. Nowadays 31% are fat and 34% of population have over weight. Researches done in Brazil showed that high prevalence of obesity can accelerate the prevalence of diabetes, cardiovascular and metabolic disease.

During 1974 to 1989, 0.2% of over weight gain annual was reported about women. International information in the United States claimed that 18% of women were fat in 1998 (BMI ≥30) and women in reproductive age had 50-70% acceleration in obesity . Many of obese women were 25-34 years old. (8)

Theoretical study

Usual way to determine abnormal weight is the use of "body mass index" in which women with BMI less than 19.8 are considered thin, BMI between 19.8 and 26 are called normal, and BMI more than 26 (before 18 weeks of pregnancy) are seen fat. Although, some researchers proposed that pregnant weight less than 45 kg are thin, and weight more than 85 kg are said to be fat.

In each prenatal visit, the amount of weight gain is calculated, but there wasn't enough information about the effect of weight gain on pregnancy outcomes.

The pregnancy of fat women can get along with Preeclampsia, Gestational Diabetes, multiple, Macrosomia, Caesarian, Malpresentation, Haemoragia in Pregnancy, tromboflebitis, UTI, Dystocia Pregnancy, Asphyxia.

Also the pregnancy of thin women can complicate with Anemia, PROM, Low Score of Apgar, Preterm Labor, and Prenatal Mortality. (14)

As the point of opposite report of relation between high BMI and pregnancy outcome, we decide to determine this relation for the presentation of these outcomes.

Experimental procedure

This cohort study was done on pregnant women who referred to Health Center of Medical University of Mazandaran (North of Iran). Sampling method used in this study was Random Sequential. Individual information such as age, educational level, blood group, and the estimated date of delivery was noted in the first visit. All the 300 pregnant women were set into five groups. In the first group the BMI was less than 19.8, in the second group BMI was between 19.8 and 26, in the third group BMI was between 26 and 29, in the fourth group BMI was between 29 and 35 and in the last group BMI was more than 35.

In the fourth and last groups the amount of weight gain was divided into three levels. First level: weight gain was less than 8 kg, second level: weight gain was between 8 and 15.9, and third le-

vel: weight gain was more than 16 kg. In both groups, age, the number of children, and the number of cigarette use were determined. We've also investigated any probable correlation between pregnancy outcomes such as preeclampsia - large or small - for Gestational age, cesarean section, use of forceps, post term delivery, fetal distress, and score of Apgar in each level of weight gain in two groups of BMI.

Results

Among 300 pregnant women, 41 persons (13.7%) had BMI less than 19.8, 33 persons (11%) BMI between 19.8 and 26, 47 persons (15.7%) BMI between 26 and 29, 110 persons (36.7%) BMI between 29 and 35, and 69 persons (23%) had BMI more than 35. Moreover, we can say 13.7% had BMI less than 20 and 23% had BMI more than 35.

According to Table 1, women with BMI more than 35 had weight gain more than 16 kg, and 51.2% of women with BMI less than 20 had weight gain from 8 to16 kg.

X^2 test showed that there was a meaningful correlation between BMI groups and levels of weight gain (p=0.011).

There was a meaningful correlation between age and height of the BMI (BMI: 29-35 and BMI >35) (p=0.05). But the correlation between the number of children and use of cigarette weren't meaningful (p=0.803, p=0.545).

In this study pregnancy outcome is determined in each level of weight gain. All outcomes in obese women were compared to pregnant women with normal BMI.

In the first level of weight gain (less than 8 kg), there was not any meaningful correlation between preeclampsia (p=0.998 R^2=308% -p=0.999 R^2=12.8%).

Forceps (p=0.998 R^2=206% -p=0.999 R^2=205%) and high level of BMI.

But the relationship between fetal distress (p=0.074 R^2=108% -p=0.022 R^2=2%) and the score of Apgar (p=0.011 R^2 =0/2% - p=0.022 $R^2$0.4%) was meaningful.

On the other hand, only the relationship of Lagan BMI 29-35 (p=0.014 R^2=603%), score of Apgar BMI > 35 (p=0.022 R^2=11.8%), cesarean section and BMI 29-35 (p=0.014 R^2=0.3%), post term delivery and BMI 29-35 (p=0.011 R^2=0.3%) were meaningful.

The women in two groups with 8-16 kg weight gain had meaningful relationship with preeclampsia (p=0.00 R^2=6.2% - p=0.001 R^2=13.9%), LGA (p=0.000 R^2 =14.7% -p=0.006 R^2=1636%), cesarean section (p=0.00 R^2=3% - p=0.001 R^2=0/4%), and score of Apgar (p=0.00 R^2=0.1% -p=0.00 R^2=0.2%).

But this relationship were only seen in SGA (p=0.00 R^2=4.6%) and fetal distress (p=0.00 R^2=0.2%) in BMI > 35.

The women in the two groups with more than 16 kg weight gain had meaningful correlation with LGA

Table 1. Relation between BMI and fetal- pregnancy outcomes

		29-35 BMI	mI >35
Weight gain less than 8kg	Preeclampsia	0.998	0.999
	Large gestational Age	0.014	0.999
	Small gestational Age	0.998	0.022
	Cesarean section	0.014	1.000
	Post term delivery	0.011	0.999
	Fetal distress	0.014	0.022
	Apgar score	0.011	0.022
Weight gain 8-16kg	Preeclampsia	0.000	0.001
	Large gestational Age	0.000	0.006
	Small gestational Age	0.000	0.998
	Cesarean section	0.000	0.034
	Post term delivery	0.000	0.001
	Fetal distress	0.000	0.998
	Apgar score	0.000	0.002

(p=0.027 R^2=27% -p=0.003 R^2=29%), post term delivery (p=0.00 R^2=0.1% - p= 0.00 R^2=0.2%), score of Apgar (p=0.00 R^2=0.2% -p=0.001 R^2=0.4%), preeclampsia (p=0.001 R^2=13.5%., and cesarean section (p=0.027 R^2=3%) with BMI 29-35.

This relationship was not meaningful with SGA (p=0.997 R^2=11.4% -p=0.998 R^2=7.1%) and fetal distress (p=0.997 R^2=1% - p=0.998 R^2=1.2%).

Discussion

This study showed that high BMI of mother and pre disposes women to complicated pregnancy can increase obstetric interventions. High BMI of mother carries significant risks for mother and fetus. The degree of obesity is related to the increase of risk (1). Our findings agree with earlier research which has shown a relation between high BMI and caesarean section. Moreover, we found an increase in post term delivery with the increase of BMI (5).

Most authors report a higher incidence in the induction of labor in fatty women than in women with normal BMI. Each unit in BMI before pregnancy can increase the risk of cesarean delivery by 7% (9).We have demonstrated that the risk of preeclampsia is positively associated with high BMI, as it was shown in the similar study of seabird metal (3), Athukorala (2), Gregory metal (10), Meenakshivm et.al. (13), Curt Miller metal (7).

On the other hand, T. T. Lao believed that the relationship between pre eclampsia and impaired glucose to learn wasn't significant. (15)

Previous studies have shown that pregnancy weight gain whitin the ranges recommended by IOM is associated with the best outcome for both mother and infants. On the contrary, some studies that retrospectively assessed the senility and specificity of this indictor, concluded that maternal weight gain alone is neither a sensitive nor a specific predictor of poor pregnancy outcome (17).

Some studies believe that the prevalence of obesity in infertile women is high. And there is a link between overweight and obesity to low pregnancy rate (11). However, we didn't examine this relationship despite all the bad results of high BMI, and higher maternal weight before pregnancy protects against the delivery of a small for gestational age infant (6).

More intervention studies are needed to determine if these complications can be prevented with intervention to diet or physical activity (12). Adequate nutrition is important for pregnant women and women will have more probability of pregnancy. Although most attention should be paid to adequacy intake of Folic Acid during the periconceptional period, obesity prevention and management is another aspect of enough nutrition. Women who are pregnant or become pregnant should avoid Folic Acid intake, smoking cessation, and avoidance ethanol use (16).

Conclusion

According to similar studies, we have demonstrated that pregnancy and fetal outcome can be accelerated in fat women and high grade weight gain in pregnancy.

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Physiological responses of macro-elements to maximal aerobic exercise among elite women and men field hockey players

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Abstract

Purpose: This research attempts to find out the changes in the calcium, magnesium, potassium, sodium and chlorine levels among elite men and women field hockey players before maximal aerobic training, immediately after training and one hour after training and to compare serum macro-element concentrations by gender.

Method: Blood samples belonging to 18 men and 13 women field hockey players (mean age 19,7) were taken before training, immediately after training and one hour after training. Macro-elements were determined using plasma emission spectroscopy methods.

Results: Calcium level among men players decreased one hour after training, yet there was no difference among females. Magnesium level dropped one hour after training among both men and women players. Potassium level reduced among men and women players very soon after training; however one hour later it reached the former level before training among women players and a higher level than the level before training among males.

Regarding sodium and chlorine levels, there was no statistically significant difference among both genders. $P < 0.05$ was considered as statistically significant.

Conclusion: It is thought that decreased levels of magnesium among men and women players resulted from the supplementing of erythrocytes with magnesium to use during exercise and from the urinary excretion. It is predicted that there was a decline in the level of parathyroid hormone so in calcium level after moderate-intensity exercise among men players. The reason why potassium level dropped very soon after training among both genders was not found out. Chlorine concentrations among women players were found higher compared to males during three measurement periods.

Key words: Physical exercise, calcium, potassium, sodium, chlorine, magnesium, macro-element, mineral

Introduction

Minerals are of vital importance for athletes due to their metabolic and physiological roles such as muscular contraction, heart beat, transmission of nerve impulses, delivery of oxygen, oxydative phosphorilation, enzyme activation, immunity functions, antioxidant activity, bone health, acid base and fluid balance[2]. As most of these physiological activities quicken during exercise, it is really important to keep mineral at required level for optimal function of the body[5]. Sportsmen should regulate their diet in accordance with adequate mineral intake since mineral deficiency affect health and sports performance[5].

Minerals are divided into two groups depending on body weight; those which weigh more than 0.1% of total body weight are called macro-elements while those weigh less than 0.1% of body weight are called micro-elements (trace elements)[1]. Macro-minerals, with relation to their abundance in the body, are calcium (Ca), phosphor (P), potassium (K), sulphur (S), chlorine (Cl), sodium (Na), magnesium (Mg) and silicon (Si). These minerals are also called macro, major or mass elements. All activities of body organs and tissues depend on these minerals which function as an enzyme catalyzer in the body[2].

Calcium in blood is essential for coagulation, muscle tone, nerve transmission and hormonal activities[1-2-3-4]. The balance between calcium ion and

sodium, potassium and magnesium ions is needed for regular contraction and relaxation of heart muscles. The change in calcium level in blood is important for the body. Low calcium levels in the bloodstream lead to tetany causing neural and muscular dysfunctions. On the other hand, congestive heart failure and respiratory insufficiency might occur if it increases.

Sodium, potassium and chlorine are electrolytes essential for osmotic pressure of body fluids, acid-base balance, nerve stimulations and functioning of muscular tissue[4]. High sodium concentration might give rise to hypertension and low sodium level could also be that much dangerous as it causes abnormal level of body fluids[6]. Sweat contains electrolyte minerals and mostly sodium. High loss of sweat, therefore, can result in loss of body fluid and even dehydration[6]. We take the sodium and chlorine that our body needs through common salt and the potassium by consuming fruit and vegetables. The amount of chlorine and potassium in the body is related with each other and the deficiency of one might cause the deficiency of the other[4]. Chlorine enables the formation of carbonate which keeps the carbon dioxide and hydrochloric acid – digestive fluid – out of blood[1].

Magnesium is another important element which fully protects the whole system in the body[8]. It is needed for the functioning of more than 300 enzymes in metabolism[7]. It is especially required for the functioning of the enzymes that regulate the reactions produced by the addition of phosphor to the molecule in the course of energy metabolism[4]. It is electrically interacted with the phosphate tail of ATP (negative charge) due to its positive charge. Thus, it helps the stabilization and the efficient use of ATP by the cells[1]. Magnesium also helps the regulation of blood pressure. Tetany, which arises when calcium level in blood decreases, is also observed in magnesium deficiency[4].

This study investigated the changes in the levels of blood serum caused by calcium, sodium, chlorine, potassium and magnesium minerals before maximal aerobic training(BT), very soon after training(AT) and one hour after training(1hAT) and it also attempted to figure out the differences on the basis of genders.

Experimental Method

Study Group and Experimental Protocol

18 men and 13 women field hockey players participated in the study. Table 1 presents the physical characteristics of athletes, their sporting experiences, BT, AT, 1hAT blood pressure and the number of heartbeats. Experimental protocol of the study was approved by the local ethical committee. All participants were informed about the purpose and risks of the study before they signed the written consent, and the studies were carried out in conformity with the Declaration of Helsinki.

Maximal aerobic exercise protocol (Shuttle-Run Test) was applied to the sportsmen.

Taking Blood Samples

Blood samples were collected in vacutainer tubes (Becton Dickinson,Franklin Lakes, NJ, USA) just before exercise, immediately after exercise and one hour after exercise and they were centrifuged at 1500 g for 15 minutes. They were stored at -86 °C and thawed once before the study.

Measures for Minerals

On the 1 mL blood samples was added 2.0 mL HNO_3 and the samples were digested in Berghof / Microwave Digestion system MWS-3 microwave apparatus. The microwaves were kept at 160 °C for five minutes and at190 °C, 100 °C and 80 °C for ten minutes each. The totally digested samples were diluted to 10 mL with the addition of deionised water. Analyses were conducted using Inductively Coupled Plasma (optical emission) spectrometry (ICP-OES Perkin Elmer, Optima 5300 DV, USA)

Statistical Analysis

Descriptive statistics in relation to data about men and women players were included in statistical analysis. Mean period values of genders was compared by independent samples t-test. Changes regarding BT, AT and 1hAT macroelement levels were tested using a repeated measures ANOVA in two genders, and pair-wise comparisons were conducted with Bonferroni test. $P<0.05$ was considered as statistically significant.

Results

Average age for the men (n=18) is 19,72±1,179, and 18,77±1,092 for the women (n=13). Mean rate of heart beat/min of the men increased from 76,44 to 148,83 before training and for the women it increased from 80,23 to 152. Systolic pressure among men decreased from BT 67,94 to AT 63,94. However, it increased among women from 60,92 to 65,38. Diastolic pressure of men indicated that it was 122,11 before training and 128,72 after training; for women it increased from 103,15 to 123.

Table 2 shows the comparison of BT, AT, 1hAT mineral levels between genders. There is statistically significant difference in all chlorine values, BT and 1hAT sodium values and 1hAt calcium values between the genders. Mineral levels in blood serum among women were higher compared to men in all elements that indicated statistical difference.

Table 3 shows the comparisons between men and women related to the changes in mineral levels of blood serum based on BT, AT and 1hAT periods. It can clearly be seen from the table that calcium 1hAT indicated a statistically significant decrease among men but it didn't among women. There was a decrease in Magnesium level among both men and women. Potassium level decreased among men during training and it went higher than 1hAT and BT levels. There was no statisti-

Table 1. Descriptive Statistics of the Subjects

	Man n=18		Woman n=13	
	Mean	Std. Deviation	Mean	Std. Deviation
Age	19,72	1,179	18,77	1,092
Height(cm)	178,39	6,687	166,31	4,990
Weight(kg)	70,83	7,755	55,38	6,397
Years of Sportsmanship	7,33	1,495	8,00	2,799
BT HB	76,44	9,513	80,23	11,791
AT HB	148,83	17,833	152,00	13,632
BT SP	67,94	11,894	60,92	8,098
AT SP	63,06	14,330	65,38	11,680
BT DP	122,11	12,893	103,15	10,383
AT DP	128,72	17,529	123,00	16,217

BT: Before Training, AT: After Training, HB: Heart Beat, SP: Systolic Pressure, DP: Diastolic Pressure

Table 2. T-Test Results Between the Genders

	Man	Woman	Mean Difference	t	p
BT Calcium(mg/dl)	9,93	10,2	-0,272	-1,510	0,142
AT Calcium	10,01	10,38	-0,367	-1,947	0,061
1hAT Calcium	9,55	10,19	-0,636	-4,269*	0,000
BT Sodium(mmol/l)	142,94	151,85	-8,902	-4,254*	0,000
AT Sodium	154,16	152,62	1,551	0,197	0,846
1hAT Sodium	139,38	151,85	-12,45	-7,412*	0,000
BT Magnesium(mg/dl)	2,36	2,34	0,014	0,201	0,842
AT Magnesium	2,38	2,38	0,004	0,057	0,955
1hAT Magnesium	2,17	2,26	-0,083	-1,251	0,221
BT Potassium(mmol/l)	5,05	5,29	-0,231	-0,905	0,373
AT Potassium	4,72	4,79	-0,065	-0,307	0,761
1hAT Potassium	5,42	5,16	0,261	1,702	0,100
BT Chlorine(mmol/l)	100,94	110,15	-9,209	-4,803*	0,000
AT Chlorine	99,72	109,23	-9,509	-5,706*	0,000
1hAT Chlorine	100,16	110,15	-9,987	-6,060*	0,000

BT: Before Training, AT : After Training, 1hAT: 1 hour after training
**Mean Difference is statistically significant,(P < 0,05)*

Table 3. Comparison analysis of BT, AT and 1hAT macroelement levels of the man and woman groups

	BT $\overline{X} \pm SD$	AT $\overline{X} \pm SD$	1hAT $\overline{X} \pm SD$	F	P
Calcium (mg/dl)					
Man	9,93 ± 0,517[a]	10,01 ± 0,517[a]	9,55 ± 0,403[b]	5,896*	0,006
Woman	10,2 ± 0,461	10,38 ± 0,522	10,19 ± 0,417	2,186	0,134
Magnesium (mg/dl)					
Man	2,36 ± 0,213[a]	2,38 ± 0,187[a]	2,17 ± 0,147[b]	13,658*	0,000
Woman	2,34 ± 0,189[a]	2,38 ± 0,230[a]	2,26 ± 0,225[b]	10,579*	0,000
Potassium (mmol/l)					
Man	5,05 ± 0,819[a,b]	4,72 ± 0,543[b]	5,42 0,377[a]	7,918*	0,004
Woman	5,29 ± 0,819[a]	4,79 ± 0,634[b]	5,16 ± 0,477[a]	6,666*	0,005
Sodium (mmol/l)					
Man	142,94 ± 6,14	154,17 ± 32,994	139,39 ± 3,31	2,716	0,080
Woman	151,85 ± 5,367	152,62 ± 4,735	151,85 ± 5,367	0,278	0,760
Chloride (mmol/l)					
Man	100,94 ± 5,396	99,72 ± 4,226	100,17 ± 3,222	0,450	0,642
Woman	110,15 ± 5,080	109,23 ± 5,036	110,15 ± 5,273	0,308	0,738

**: Difference is statistically significant within groups. (P < 0,05)*

[abc] :Difference is statistically significant between the groups with different letters in the same line. (P<0,05)

cal difference between AT and 1hAT potassium levels. Potassium level among women demonstrated a statistically significant decrease during training, yet it regained the 1hAT and BT levels. No difference was observed between sodium and chlorine figures among both genders.

Discussion and Conclusion

It was found that calcium serum concentration among men decreases one hour after training (Table 3). There is no difference in calcium concentration of women between periods. 1hAT serum calcium concentration of men is less than that of women (Table 2). Though there is a general decline in serum calcium concentration at the end of aerobic and anaerobic training[9-10], CA, in some studies, goes up due to exercise[11-12] and it remains stable in other studies[13-14]. At the same time, calcium excretion through urine also increases with exercise[15]. Blood PH which decreases with lactic acid accumulation and increases with exercise causes acid and CA excretion by kidneys. However, changes in serum calcium concentrations may not be clear in general sense because calcium is primarily under homeostatic control. Parathyroid hormone (PTH) acts to increase the concentration of calcium in the blood by increasing the calcium secretion by bones and the calcium absorption in intestine and kidney tubules, whereas calcitonin hormone acts to decrease calcium concentration by decreasing bone Ca secretion and accelerating kidney Ca excretion. The intensity of exercise affects PTH secretion. Takada et al. find that an unstable PTH level after high-intensity training and moderate-intensity exercise decreases PTH level[16]. It is estimated in this study that Ca concentrations of men hockey players which drop one hour after exercise result from a decline in PTH level and from an increase in urinary calcium excretion.

According to findings, serum Mg concentration decreased among men and women one hour after training (1hAT) (Table 3). Serum Mg concentration did not demonstrate a statistically significant difference between genders in all periods (Table 2). Various studies suggest that Mg level reduces after training[17-18-12-9-13]. Exercise increases the secretion of magnesium into red blood cells. Mg serum concentration changes depending on the intensity of the exercise[19-20]. The increase in serum Mg concentration during high-intensity but short time exercise depends on the decrease in plasma volume[21-22-23]; however, changes in endurance exercises are based on different factors. As indicated by some other studies, the most evident of these factors which we also thought to be the reason for the decrease

in Mg concentration in our study is the transfer of magnesium to erythrocytes to be used during exercise[19-24-20-13-25-26]. Erythrocyte magnesium concentration also increases along with magnesium which reduces during exercise[25-26]. Although the cause of this transfer is not exactly known, it is thought to be on account of that magnesium increases the functions of erythrocytes needed for ATpase activity and dephosphorization during exercise[26]. Another reason found in our study for the decrease in 1hAT serum Mg concentration could be the positive relationship between the use of O^2 and lactate level and the urinary Mg excretion[20].

Our study reveals that potassium levels of men and women hockey players change based on periods. 1hAT potassium level among men was significantly high compared to AT potassium level (Table 3). On the other hand, potassium concentration of women which decreased significantly after training regained its former level one hour after training (1hAT) (Table 3). There was no difference in BT, AT and 1hAT potassium levels between the genders (Table 2). In parallel with findings, some studies indicated decrease in potassium level after training[13-27]. However, there are a large number of studies suggesting an increase in potassium level after exercise[17-28-29-30]. McMurray and Tenan found that plasma potassium level demonstrated a linear increase with exercise intensity, lactate and ventilation increase[28]. The reason for the rise in serum and plasma potassium concentrations is thought to result from potassium secretion by skeletal muscle cells, smooth muscle cells of veins and blood cells[17-29-31-32]. The reason for the potassium decline right after training is not exactly known. Nevertheless, the fact that it regained 1hAT and BT levels is thought to be due to re-absorption of potassium secreted by muscle cells and to the reaction of parasympathetic system to optimize cardiovascular system during relaxation.

Our study found no significant difference between sodium and chlorine BT, AT and 1hAT serum concentrations (Table 3). However, chlorine concentrations of women were approximately 10 mmol/l higher than those of men at each of three measurements (Table 2). The fact that exercise period is not long enough to alter fluid balance is thought to maintain sodium and chlorine balance of the body. Long-term exercise training and competitions might lead to dehydration as a result of severe fluid and sodium loss. A reduction is observed in serum and chlorine concentrations as a result of urinary excretion when the duration of exercise gets longer[33-34-35-36-37-38].

Studies recommend that fluid balance should be checked before and during training and it should be supplemented with fluids containing sodium in case of fluid loss[33-34-39-40-41]. Perspiration and lack of sodium depends on the person[42] and planning for hydration and the change in fluid, therefore, should be unique to that person. Similarly, Mg supplementation positively affects muscle metabolism and work efficiency[24-43-44-31-19]. In conclusion, although blood macro-elements balance of athletes are protected by their bodies, maintaining mineral levels through diet is really important for their performance and health.

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Study prevalence of multidrug-resistant (MDR) and extensively drug-resistant (XDR) Tuberculosis in East Azerbaijan province of Iran

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Abstract

Background and objectives: Drug resistant tuberculosis (TB) is a man-made problem. While tuberculosis is hundred percent curable, multi drug resistant tuberculosis (MDR-TB) is difficult to treat. Inadequate and incomplete treatment and poor treatment adherence has led to a newer form of drug resistance known as extensively drug resistant tuberculosis (XDR-TB). The aim of this study was to determine prevalence of XDR-TB in east Azerbaijan province of Iran.

Methods: Drug susceptibility testing to second line drugs including amikacin, kanamycin, ofloxacin and ciprofloxacin was performed on isolated eight MDR-TB strains. H37RV *Mycobacterium tuberculosis* (susceptible to all drugs) was used as a control strain.

Results: Eight strains out of 230 isolates (3.48%) were diagnosed to be MDR-TB, and three strains (1.3%) out of eight MDR-TB strains, were found to be XDR. All three XDR strains were from patients who had come to Iran from Nakhchivan of Azerbaijan. All patents were male.

Conclusion: Since the XDR-TB was only seen from Nakhchivanian patients isolates, referring these patients to Tabriz Research Center of TB and pulmonary diseases for diagnosis and treatment is problematic, and special measures should be taken.

Key words: Tuberculosis, XDR-TB, East Azerbaijan

Introduction

More than 128 years ago *Mycobacterium tuberculosis* was discovered and still it is one of the major causes of death in the world [1]. Several studies by epidemiologists have revealed that about one third of people carry the tuberculosis bacillus world wide and it kills some 3 million people every year [2]. Since the beginning of chemotherapy against tuberculosis, several resistant strains of *M. tuberculosis* have emerged. According to reports, the rate of multi-drug resistant tuberculosis (MDR-TB) has increased greatly in countries like Azerbaijan in the north of Iran [3]. Since some of these infected patients come to the Center for Research on Tuberculosis and Lung Diseases in the University of Medical Sciences at Tabriz in Iran for diagnosis and treatment, there is a high risk transmission of MDR and XDR *M. tuberculosis* for Iranian citizens and specialists and authorities should be alarmed. Increasing resistance to drugs may be caused by lack of proper treatment i.e. prescribing wrong drugs, lack of multi drug treatment and applying one single drug and unfinished treatment period, lack of tuberculosis control actions in some countries, decreased efficiency of the tuberculosis drugs and outbreak of AIDS [4].

Nowadays, MDR-TB and XDR-TB are two fundamental problems of controlling and fighting tuberculosis all around the world for these two strains of drug resistance have been reported from almost every country [5]. Multi-drug resistant TB is defined as the disease caused by *Mycobacterium tuberculosis* that is resistant to at least isoniazid and rifampicin with or without resistance to other anti-TB drugs [16].

Extensively drug-resistant tuberculosis (XDR-TB) is defined as resistance to at least rifampin (R) and isoniazid (H; this is the definition of multi-

drug-resistant tuberculosis (MDR-TB)), in addition to any fluoroquinolone, and at least one of the three injectable antituberculosis (TB) drugs (capreomycin, kanamycin and amikacin) [16].

Global emergence of XDR-TB was first reported in 2005 [6]. When the second-line drugs are misused, or controlled improperly, this strain of tuberculosis outbreaks. Since XDR-TB is more resistant to first and second-line drugs, the success in treatment is limited to 30 to 50%. Thus, control and management of XDR-TB is vital and importance. Curing MDR-TB and XDR-TB is extremely hard and in some cases impossible for the effect of second-line drugs is near to nothing and the treatment takes a very long time [7]. On the other hand, curing drug resistant tuberculosis in poor countries doubles the problem i.e. treating tubercular suffering drug resistant tuberculosis is as much as one hundred times more than normal bacillus sensitive to normal drugs. Therefore, proper control programs aiming at stopping multi-drug tuberculosis outbreak along with extensively drug-resistant tuberculosis is a crucial task to accomplish.

The aim of this study was to determine prevalence of XDR-TB in east Azerbaijan province of Iran.

Material and methods

This study was performed from 3 April 2010 to 15 September 2010 in research center of TB and pulmonary disease Tabriz University of Medical Sciences. In order to ensure the isolated strain, several tests including niacin test, nitrate reduction test, heat-resistant catalase (68 degrees centigrade) were conducted and 8 MDR-TB strains were selected from the 2007- 2010 specimens. Then, the effects of the second-line drugs were studied on them [9]. All strains were grown in Lowenstein–Jensen media with and without antibiotics. The H37Rv strain, sensitive to all drugs was used as the quality control strain. Proportional method was used for determining medicinal sensitivity. This method is approved by World Health Organization (WHO) and Clinical and Laboratory Standards Institute (CLSI).

In order to do so, a bacteria suspension of 0.5 McFarland dilution was provided and then a dilution of 0.01 was prepared using it. 0.2 milliliter of this diluted suspension with 0.01 concentration was injected into each Lowenstein–Jensen media with and without antibiotic (experimental and control media). In the next phase, the media were incubated at 37 degrees centigrade for 28 to 42 days.

The final concentration of each drug in Lowenstein–Jensen medium was:

- Ofloxacin (4μg/ml)
- Ciprofloxacin (4μg/ml)
- Amikacin (20μg/ml)
- Kanamycin (20μg/ml)

After incubation, the number of colonies grown in control (without antibiotic) and experimental (with antibiotic) media were compared. According to relative method, when the bacteria growth rate (number of colonies) in the media with antibiotic is less than 1% of the number of colonies in a media without antibiotic, the bacteria is supposed to be sensitive. However, if the growth rate is equal or more than 1% of the number of colonies in the control medium (without antibiotic), the bacteria is supposed to be resistant.

Results

The results of the drug susceptibility testing are listed in (Table 1): From among the listed samples archived from 2007 to 2010 (about 230 isolates), 8 strains were diagnosed to be MDR-TB 2 of which (25%) are only resistant to ofloxacin. 4 of them (50%) were resistant to kanamycin, 1 strain (12.5%) was resistant to amikacin and 1 strain (12.5%) was resistant to ciprofloxacin. Three of these strains (37.5%) were resistant to all four drugs (ofloxacin, kanamycin, amikacin and ciprofloxacin). Most of the strains were sensitive to ciprofloxacin and amikacin. In other words, they had the lowest resistance and the highest efficiency. Knamycin showed the highest resistance.

Discussion

Expansion of MDR-TB and XDR-TB is a global issue and causes a lot of distress [11]. Inadequate and improper use of drugs is among the most important causes of drug resistance against anti-tuberculosis drugs and this resistance is increasing. Findings of the present study reveal that drug resistant tuberculosis is growing rapidly in

Table 1. Prevalence of MDR and XDR-TB isolates in East Azerbaijan province of Iran

Resistance	Name of resistant drugs	Number of resistant strains	Percentage
MDR-TB	Main anti-tuberculosis drugs OFX+ (INH, RIF)	2 strains of 8 strains	25%
	Main anti-tuberculosis drugs KA+ (INH, RIF)	4 strains of 8 strains	50%
	Main anti-tuberculosis drugs CIP+ (INH, RIF)	1 strain of 8 strains	12.5%
	Main anti-tuberculosis drugs AM+ (INH, RIF)	1 strain of 8 strains	12.5%
XDR-TB	Main anti-tuberculosis drugs AM+ (INH, RIF) CIP, KA, OFX	3 strains of 8 strains	37.5%
		3 strains of 230 strains	1.3%

Table 1. Resistance of MDR-TB against Aminoglycosides (AM & KA) and Fluoroquinolones (CIP & OFX)
AM: Amikacin, CIP: Ciprofloxacin, INH: Isoniazid, KA: Kanamycin, OFX: Ofloxacin, RIF: Rifampin

East Azerbaijan province and this should be taken seriously. All three strains of XDR-TB were from the Nakhchivanian strains and the point that Nakhchivan citizens suffering tuberculosis come to the Center for Research on Tuberculosis and Lung Diseases in the University of Medical Sciences at Tabriz for diagnosis and treatment is an alarming fact for the people in the region, authorities and specialists in the field. In case drug resistant strains are not treated properly, new types of tuberculosis called Super Extensively Drug Resistant Tuberculosis (SXDR-TB) or Totally Drug-Resistant (TDR) will emerge.

A similar study conducted by Velayati et al. (2009) found that among 146 strains of MDR-TB, 8 strains (5.4%) are XDR-TB and 15 strains (10.3%) are TDR-TB all of which had been brought by Afghani, Azerbaijani and Iraqi immigrants [12]. Indecent management of tuberculosis provides the ground for expansion of drug resistant tuberculosis bacillus. Jain et al. (2008) reported global outbreak of XDR-TB and its prevalence is reported to be 1.5% in Asia [13]. Another study conducted by Datta et al. reported a 15.3% rate for XDR-TB in Kashmir. Punga et al. (2009) conducted a similar study in Moscow and found that the prevalence of XDR-TB was 4.9%. In order to stop the outbreak of XDR-TB, conducting medicinal sensitivity tests, reporting cases, intensive care and infection control are mandatory.

Conclusion

Our study revealed that the rate of MDR and XDR-TBX in East Azerbaijan province is 3.48%and 1,3 % respectively All XDR-TB strains isolated from Nakhchivanian patients. It could be concluded that, the people coming from Nakhchivan to the Center for Research on Tuberculosis and Lung Diseases in the University of Medical Sciences at Tabriz is problematic and special measures should be taken to stop the expansion and outbreak of drug-resistant tuberculosis.

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The effect of isoniazide on myocardial tissue: protective role of cape

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Abstract

Aim: To investigate a toxic effect of Isoniazide on the myocardial tissue and protective role of the caffeic acid phenyl ester (CAPE).

Material and methods: *Animals*: Male Sprague–Dawley rats were divided into four experimental groups, with ten animals in each group; Control, INH-treated group, CAPE treated group and INH plus CAPE-treated group.

Biochemical analyses: Superoxide dismutase activity was measured according to the method described by Fridovich. Lipid peroxidation level in the myocardium was expressed as malondyaldehyde (MDA). It was measured according to procedure of Ohkawa et al. The total antioxidant capacity of supernatant fractions was evaluated by using a novel automated and colorimetric measurement method developed by Erel (13).

Histopathological analyses: Myocardial tissue specimens were fixed in 10% formaldehyde, dehydrated in alcohol solution and were embedded in paraffin for 24 hours and used for histopathological examination. Four micrometer (μm) thick sections were cut, deparaffinized, hydrated and stained with hematoxyline and eosin (H&E) under a light microscope (Nikon Eclipse 80i, JAPAN).

Results: In the INH group, malondialdehyde and total oxidant status levels were significantly higher than those of the control group in the myocardial tissues ($p<0.05$). In the INH group myocardial TAC levels, activities of SOD and PON-1 decreased compared with control group ($p<0.05$). CAPE plus INH treatment caused a significant decrease in MDA and TOS generation in the myocardium ($p<0.05$). Also, CAPE plus INH caused a significant an increase in TAC levels, SOD and PON-1 activities ($p<0.05$).

Conclusion: We have shown that experimental administration of INH is accompanied by increased lipid peroxidation and oxidants in myocardial tissues of rats. Therefore, we suggest that oxidative stress is a cause of INH induced cardiotoxicity. Simultaneously, CAPE is a protective agent in this toxicity by overcoming the inactivation of antioxidant enzyme systems by INH. Thereby CAPE may play a role in preventing INH induced cardiotoxicity.

Key words: Isoniazide, myocardial toxicity, CAPE

Introduction

Isoniazide (INH) still remains a first-line drug both for the treatment and the prophylaxis of tuberculosis (1,2). However, treatment with INH has been related with various toxic effects on the red blood cells, liver and the brain in patients subjected to the drug (4-5). On the other hand, the possible toxic effects of INH on the myocardial tissue have not been investigated.

Although several hypotheses have been suggested, the mechanism leading to the toxic effects of INH has not been cleared yet. Recent studies have implied that oxidative stress may be one of the mechanisms responsible for the INH-induced cytotoxicity. It has also been observed in these studies that tiols, caffeic acid phenyl ester (CAPE) which is also an antioxidant, and antioxidant enzymes may possibly become important adjuncts to the INH treatment (2).

Increased free radical production exerts toxic effects on the membrane phospholipids and results in the formation of toxic products such as malondialdehyde (MDA). The decrease in the total antioxidant capacity (TAC) and the increase in the total oxidant status (TOS) are closely related with the oxidative stress. The normalization of these levels through medication is vital for the attenuation of the oxidative tissue damage (3).

Caffeic acid phenyl ester (CAPE) is an active component of honeybee propolis and it has been related with antiviral, anti-inflammatory and immunomodulatory effects. The substance has also been shown to inhibit the growth of various types of transformed cells. Moreover, it also exerts important antioxidant effects (6,7). At a concentration of 10 μM, it completely inhibits the production of reactive oxygen species (ROS) found in human neutrophils and the xanthine/xanthine oxidase (XO) system (8).

In the present study, we aimed to investigate the possible toxic effect of INH on the myocardial tissue and possible protective effect of the CAPE.

Materials and methods

This study was approved by Dicle University Animal Ethics Committee and was conducted in accordance with the ''Animal Welfare Act and the Guide for the Care and Use of Laboratory animals prepared by the Dicle University, Animal Ethics Committee''. Forty male Sprague–Dawley rats (aged 8–12 weeks) weighing 230 ± 30 g (mean ± standard deviation) obtained from the Laboratory Animal Production Unit of the Dicle University were used for the purposes of the experiment. The rats were placed in a temperature (22 ±2°C) and humidity (50±5%) controlled room in which 12-hour light/dark cycles were maintained for 1 week before the start of the experiment. A standard diet and tap water were provided ad libitum. The male Sprague–Dawley rats were divided into four experimental groups with ten animals in each: The control group (Group 1), the INH- treated group (Group 2), the CAPE treated group (Group 3), and the INH plus CAPE-treated group (Group 4). The INH-treated and the INH plus CAPE-treated groups were orally administered with a dose of 50 mg/kg/day of INH in the tap water for 30 days (2,9). The INH was obtained from the Diyarbakir Tuberculosis Dispensary (Diyarbakir Tuberculosis Dispensary, Diyarbakir, Turkey) and was dissolved in tap water before being administered orally at the above-mentioned dose via disposable plastic syringes. After the rats received the specified treatment, they were fed ad libitum until midnight. Then the rats were anaesthetized with ether and myocardial tissue samples were obtained. Half of these tissues were stored at −50ºC until the biochemical analysis. The remaining myocardial tissues were fixed in 10% formaldehyde for the histopathological examination.

Biochemical analyses

After the excised myocardial tissue samples were weighed, they were immediately stored at −50°C. Assays were performed on the supernatant of the homogenate that was prepared at 14.000 rpm for 30 min at +4°C. The protein concentration of the tissue was measured by the method of Lowry (10). Superoxide dismutase (SOD) activity was measured according to the method described by Fridovich (11). Serum PON-1 levels were measured spectrophotometrically by a modified version of the Eckerson method (12) The lipid peroxidation level in the myocardium, measured according to procedure of Ohkawa *et al*. (13), was expressed as malondialdehyde (MDA). The TAC of the supernatant fractions was evaluated using a novel automated and colorimetric measurement method developed by Erel (14), in which hydroxyl radicals - the most potent biological radicals - were produced. In the assay, the ferrous ion solution present in reagent 1 is mixed with the hydrogen peroxide within the reagent 2. The subsequently produced radicals, such as brown-colored dianisidinyl radical cations produced by the hydroxyl radicals, are also potent radicals. Through this method, the antioxidant effect of the sample is measured against the potent free radical reactions initiated by the produced hydroxyl radicals. The assay has excellent precision values lower 3%. The TAS results are expressed as nmol Trolox equivalent/mg protein. The TOS of the supernatant fractions was also evaluated through the novel automated and colorimetric measurement method developed by Erel (15). In this method, the oxidants contained in the sample oxidize the ferrous ion–o-dianisidine complex into ferric ion. The oxidation reaction is increased by glycerol molecules, which are abundant in the reaction medium. The ferric ion forms a colored complex with the xylenol orange in an acidic medium. The spectrophotometrically-measured color intensity is related to the total amount of oxidant molecules present within the sample. The assay is calibrated with hydrogen peroxide and the results are expressed in

terms of nmol H_2O_2 equivalent/mg protein (16). The myocardial tissue TOS and TAC values were measured in μmol H_2O_2 Equiv/gram protein and mmol H_2O_2 Equiv/gram protein, respectively.

Histopathological analyses

For the light microscopic investigation, the myocardial tissue specimens were first fixed in 10% formaldehyde and then dehydrated in alcohol solution and embedded in paraffin for 24 hours before being subjected to the histopathological examination. Four micrometer (μm) thick sections were cut, deparaffinized, hydrated and stained with hematoxyline and eosin (H&E) under the light microscope (Nikon Eclipse 80i, JAPAN). In order to characterize the histopathological changes, all tissue sections were examined microscopically by an experienced histologist blinded to the groups.

Statistical Analyses

The statistical analysis was performed using the Statistical Package for the Social Sciences version 11.5 (SPSS 11.5 for Windows, Chicago, IL, USA). Data were expressed as mean ± SD. The normality of the distribution for all variables was assessed by the Kolmogorov–Smirnov test. The Mann–Whitney U-test was used for the variables outside the normal distribution. The one-way analysis of variance (ANOVA) and post hoc multiple comparison tests (LSD) were performed on the data of biochemical variables to examine the difference among the groups. A p-value of <0.05 was considered as statistically significant.

Results

Biochemical Results

The biochemical results obtained from the rat myocardial tissues are shown in Table 1.In the INH group, the MDA and TOS levels of the myocardial tissues were higher than the control group ($p<0.001$). In the rat myocardium, activities of the SOD and PON-1 were decreased in the INH group compared to the control group ($p<0.001$). Besides, the TAC levels were also observed to decrease significantly in the INH group in comparison to the control group ($p=0.007$). The CAPE plus INH treatment led to a significant decrease in the generation of MDA and TOS within the myocardium in comparison to INH alone ($p<0.001$). Also, the CAPE plus INH treatment modality caused a significant increase in the TAC levels, and the SOD and PON-1 activities in the myocardium when compared to INH alone ($p<0.05$).

Histopathological Results

In the control and CAPE groups, no histopathological change was observed (Figure 1), while moderate edema, vascular congestion and slight myofibrillar degenerations were detected in the myocardium of the INH group (Figure 2). In the INH plus CAPE group, there was minimal edema present in the myocardium (Figure 3).

Table 1. Biochemical results obtained from the rat myocardial tissue

Groups	TAC (mmol Trolox Eq./g protein)	TOS (mmol H_2O_2 Eq./g protein)	MDA	SOD	PON-1 (U/L)
Control (I)	0.52±0.05	161.1±35.2	234.0±21.0	3.91±0.52	15.7±1.7
INH (II)	0.35±0.32	231.2±47.2	365.4±34.8	2.11±0.33	10.6±1.6
CAPE (III)	0.51+0.06	178.5±21.3	220.5±41.2	3.69±1.49	14.5±2.6
INH+CAPE (IV)	0.46±0.21	121.7±39.5	226.9±45.0	3.06±0.75	12.8±2.9
P values					
I-II	0.005	0.002	0.001	0.001	0.001
II-IV	0.014	0.001	0.001	0.05	0.035
I-IV	0.03	0.025	0.02	0.027	0.01
I-III	0.39	0.71	0.43	0.56	0.61

N.S: Not significant

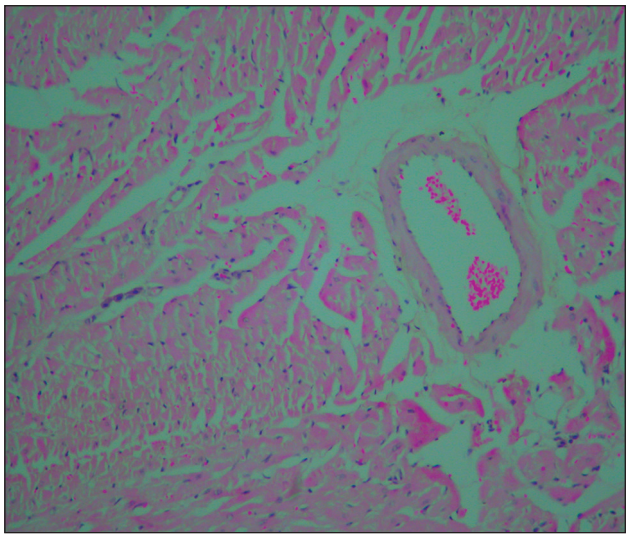

Figure 1. Control group. (H&E stain, x200)

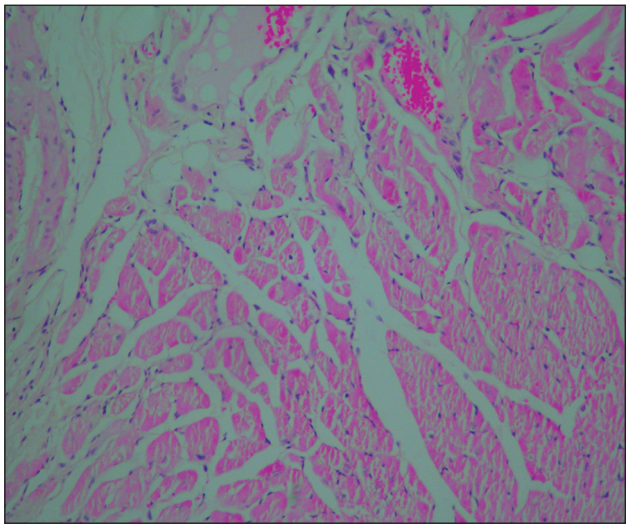

Figure 2. INH group. Moderate edema, vascular congestion and slight myofibrillar degenerative changes in the myocardium (H&E stain, x200).

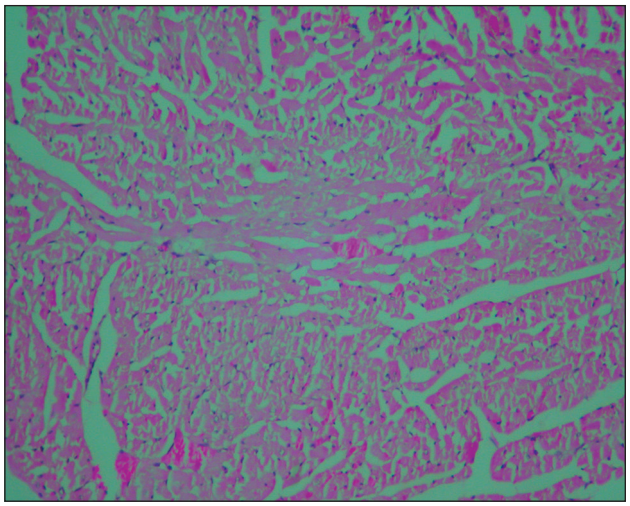

Figure 3. INH+CAPE group. Minimal edema in the myocardium (H&E stain, x200)

Discussion

To our knowledge, this is the first study to investigate the cardiotoxic effect of INH and the results we obtained have demonstrated the toxic effect of INH on the myocardial tissue. Moreover, also according to the results of the presents study, this toxic effect may be related to an increase in the oxidative stress which can be prevented through the administration of CAPE.

Oxidative stress results from either an increase in the ROS or an impairment of the antioxidant defence systems. Increased ROS can attack the cellular structures including the lipids, proteins, and the DNA. The lipid peroxidation products are measured as an index of the oxygen free radical formation. Measurements of TOS and MDA provide a sensitive index for the level of lipid peroxidation and the oxidative stress (14). Cells have several mechanisms to counteract the damage caused by the free radicals and other reactive oxygen species. One important line of defence is a system of enzymes, including the glutathione peroxidases, superoxide dismutases and catalase, which decrease the concentrations of the free radicals within the tissues. Although determination of either the oxidants or the antioxidant components alone may supply information about the oxidative injury, determination of the oxidants along with the antioxidants is a more useful method in this context (17). Thus, the oxidant and the antioxidant capacity may be measured simultaneously to assess the oxidative stress more precisely (18). In our study, we evaluated the TAC to observe the anti-oxidant status and the TOS to investigate the oxidative status using a recently developed measurement method by Erel (15). We also investigated the MDA level together with the SOD and PON-1 activities in the INH-administered rats. According to our observation, the TAC levels in the myocardial tissue were significantly decreased in INH-administered rats in comparison to the controls. This decrease in TAC may result from an over-consumption of all the endogenous antioxidants due to these drugs cardiotoxicity. We also found that the SOD and PON-1 activities were lower in the INH-administered rats compared to the controls.

SOD catalyzes the conversion of the superoxide radicals to hydrogen peroxide. Thus, it protects

the cell against the toxic effects of the superoxide radicals. PON-1 is an antioxidant enzyme which prevents the oxidation of the low-density lipoprotein by hydrolyzing lipid peroxides. In addition to the lipid peroxides, PON-1 also effects on the hydrogen peroxide, and it has been proposed to have peroxidase-like activity since it reduces the hydroperoxides and the hydroxyl radicals. Decreased SOD and PON-1 activities probably result from the inactivation of the ROS brought about by this drug or by a decreased production and/or increased catabolism of these enzymes due to INH toxicity. As a result, the PON-1 activity is reduced under high oxidative stress conditions (19). Thus, we suggest that the decreased SOD and PON-1 activities in the myocardial tissue of the rats might be related to the INH-induced oxidative stress. In INH-treated rats, co-administration of CAPE normalized the SOD and PON-1 activities within the myocardial tissue. The present study indicates that CAPE significantly prevents the depletion of the myocardial tissue SOD and PON-1 activities by scavenging the free radicals produced by INH.

Certain anti-tuberculosis drugs may cause oxidative damage in various tissues. Attri *et al.* (2) claimed that INH and/or its metabolites acetylisoniazide, hydrazine and monoacetylhydrazine may cause free radical production in several tissues, and this might lead to lipid peroxidation. Moreover, these toxic effects can be prevented by N-Asetylcysteine. In a previous study, increased lipid peroxidation has been shown to correlate with the degree of the oxidative effects of INH in the rat hippocampus (20). Gokalp *et al*., (9) also reported that INH causes a significant increase in the MDA levels within the rat red blood cells and the co-administration of CAPE with INH decreases the MDA levels. Rana *et al*., (21) have demonstrated an increased lipid peroxidation in INH and rifampicin-induced hepatic injury in rats. We have observed that INH leads to a significant increase in the TOS and MDA levels within the myocardial tissues. These increases may occur due to the overproduction or decreased excretion of oxidant substances. The increased lipid peroxidation and oxidant formation within the myocardial tissue of the rats receiving INH suggests that the cardiotoxic effect is caused through the oxidative damage. Our results suggest that INH increases the oxidative stress either by modulating the production of the free radicals, reactive oxygen species and toxic cytokines leading to the inflammation; or via direct tissue damage. In our study, the powerful antioxidant and free radical scavenger CAPE decreased the lipid peroxidation and oxidant formation in a significant manner. It seems that the cardiotoxic effects of INH result from the oxidative damage. The reduced MDA and TOS levels through CAPE point out that CAPE might be a novel agent in the way to protect the myocardial tissue from the oxidative stress caused by the cardiotoxic effects of INH.

Mollaoglu et al have shown that the CAPE prevents cadmium induced cardiac impairment in rats. Similar to our hypothesis, they claim that this preventive role of CAPE may related to decrease of LPO induced cardiac impairment (22).

In addition to the improvement in the oxidative stress levels, we have also observed in the histopathological evaluation that CAPE can reduce the myocardial damage. These findings also confirm the protective effect of CAPE on the INH-induced cardiotoxicity.

Based on the results of our study, we may conclude that the experimental administration of INH is accompanied by an increased lipid peroxidation and higher oxidant levels in the myocardial tissue of rats. Therefore, we suggest that the oxidative stress is a cause of the INH-induced cardiotoxicity. Simultaneously, CAPE emerges as a protective agent against this toxicity since it seems to work against the inactivation of the antioxidant enzyme systems brought about by INH. Thus, CAPE may play a role in preventing the INH-induced cardiotoxicity.

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A review on insecticide resistance in German cockroach Blattella germanica (L.) (Dictyoptera: Blattellidae) from Iran

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Abstract

The German cockroach, *Blattella germanica* (L.), is an urban pest affecting human health in hospitals and residential areas. Application of insecticides is the most common control measure and the development of insecticide resistance in this species is of crucial operational importance. Many studies reported the development of resistance to different insecticides including organochlorine, organophosphorous, carbamate and pyrethroid insecticides in *B. germanica* in Iran. The aim of this article is to review and compile the results of the studies undertaken in Iran and elsewhere for better understanding of the resistance and implications for controlling this serious pest.

Key words: German cockroach, *Blattella germanica*, insecticide resistance, Iran

Introduction

The German cockroach, *Blattella germanica* (L.), is a common urban pest affecting human health in hospitals and residential areas throughout the world. This insect is involved in mechanical transmission of pathogenic agents including intestinal protozoan and bacteria (1, 2). In addition, the potential role of the German cockroach in inducing of asthma has been reported (3). Being a household pest and involving in the transmission of different germs to humans are enough to justify intensive control measures against them. Cockroaches can be controlled by residual spray, dust, baits and gels. Although other strategies such as environmental control measures are also available, the usage of insecticides has been essential for controlling this insect (4, 5). Application of large amounts of various insecticides from different classes over long periods has led to development of resistance to these insecticides (6,7,8).

In Iran, the usage of insecticides for cockroach control is not properly regulated, hence control failure is reported in some field populations implicating possible insecticide resistance (9, 10).

Many studies have been conducted to determine the susceptibility levels of different strains of the German cockroach to pesticides, to provide the base line data of resistance, and to investigate the potential underlying mechanisms of insecticide resistance in this pest in Iran. The results of these studies have been published in the form of national and international articles. The objectives of this article are compiling, reviewing and summarizing the results of the conducted studies determine the susceptibility status and understand the insecticide resistance and its underlying mechanisms to achieve effective insecticide resistance management strategies.

1. A brief history of German cockroach control in Iran

The residential areas and hospitals have been sprayed with different insecticide including organophosphates, carbamates and pyrethroids for a long period of time, sometimes with disappointing failures (9,11, 12, 13,14).

1.1. Insecticide susceptibility

During 1990s, most studies reported complete susceptibility, hence successful control of German cockroach using different insecticides. Vazifeh-Shenas, 1990, in a study of susceptibility level of hospital collected strains of German cockroach from Tehran to several insecticides, revealed that bendiocarb and permethrin were the most effective compounds against German cockroach (15). In

1992, Motevali-Haqi, suggested that permethrin was a potent insecticide against hospital collected strains of German cockroach from Mashad, an eastern province of the country (16).

Ladonni, 1993, reported that some hospital collected strains of German cockroach from Tehran were susceptible to primiphos-methyl, solfac and empire-20 (9).

Mousavi, 2000, suggested that some populations of German cockroach were still susceptible to primiphos-methyl, an organophosphorous compound (13).

1.2. Insecticide resistance

The development of insecticide resistance in the German cockroach, *Blattella germanica*, is a serious problem in controlling this household pest. Control failures in field populations of German cockroach due to insecticide resistance, have been frequently reported in the world, as well as in Iran (10, 17,18). The resistance status in the German cockroach to different classes of insecticides is briefly reviewed as follows.

1.2.1. Organophosphorous and carbamate insecticides

The earliest paper on insecticide resistance of German cockroach appeared in 1988, by ladonni et al., reporting resistance of some populations of German cockroach to organophosphate diazinon and carbamate propoxur (11). The resistance to diazinon was reported again by Ladonni, 1993 and Shahi et al., 2008 (9 , 19). Limoee et al., 2010, reported resistance to chlorpyriphos, malathion, carbamate and bendiocarb in some hospital collected strains of German cockroach from Tehran, using discriminative doses (20). In another study by Limoee et al., 2011, insecticide resistance status in three hospital collected strains of German cockroach from Kermanshah, a western province of the country, detected low to moderate levels of bendiocarb resistance and low level of chlorpyriphos resistance (21).

1.2.2. Pyrethroid insecticides

Pyrethroid insecticides have been used extensively to control the German cockroach, because of their effectiveness and low mammalian toxicity in Iran. Nevertheless, frequent and intensive use of these compounds has resulted in the development of resistance in this insect so that pyrethroid resistance have become prevalent among the different populations of German cockroach (9,10 ,12).

1.3. Cross resistance

Since late 1990s, pyrethroid insecticides have been popular for German cockroach control, particularly due to their effectiveness and safety. However, the issue of cross resistance between pyrethroids and organochlorine DDT, could have caused control failure in field populations.

Limoee et al. 2006, detected a high level of DDT resistance in five pyrethroid resistant field collected strains of German cockroach from Tehran. These findings suggested the possible cross resistance between three pyrethroids including permethrin, cypermethrin and cyfluthrin, and DDT (22).

Ladonni 1997, suggested that the resistance to sumithrin in some field strains of German cockroach, was probably due to cross resistance to the other pyrethroid insecticides (10).

The introduction of fipronil gel bait for coackroach control since 2000s, initiated the study of cross resistance between this compound and dieldrin, because a potential cross resistance to earlier applied cyclodiens (23). Therefore, attempts were made to study the toxicity and cross resistance patters of fipronil against German cockroach in Iran. Nasirian et al. 2006, in a comparative study on toxicity of fipronil and dieldrin, showed that there was no relationship between the resistance to these two insecticides (24).

2. Comparative studies on the bioassay methods for determining insecticide resistance of German cockroach

Different bioassay methods for determining resistance level of German cockroach were compared based on resistance ratio. Ladonni & Sadeghiany, 1998, found that knockdown tests always

show higher resistance ratios than the mortality tests. So, the authors concluded that the knockdown test could be rather better determinant for rapid detection of resistance in any field population (12). Ladonni, 2000, also suggested that the resistance ratios obtained by topical application and tarsal contact methods were similar to each other (25). Ladonni et al., 2001, compared resistance ratios obtained by two methods of glass Petri-dish coated with permethrin 15 mg/m^2 and 2% permethrin impregnated paper. This study demonstrated that two methods had the same sensitivity for detecting resistance of the first nymphal stage of German cockroach to permethrin(26).

In another study Ladonni, 2001, evaluated the efficacy of three methods, lethal dose test (LD) by topical application method, lethal time test (LT) and knockdown test (KT) by tarsal contact method for detection of resistance of adults and nymphs of German cockroach to permethrin. The results of this study demonstrated that the LD and KT methods were the most sensitive for detecting the resistance of adults and nymphs of German cockroach to permethrin (14).

3. Mechanisms involved in insecticide resistance of German cockroach

Studies of insecticide resistance mechanisms allow us to design insecticide resistance management strategies and effective control measures of German cockroach. Synergistic and biochemical studies are necessary to provide evidence for detecting the mechanisms involved in insecticide resistance (27, 28, 29).

3.1. Synergistic studies on insecticide resistance mechanisms of German cockroach

Several studies showed that the synergist piperonyl butoxide (PBO), the inhibitor of monooxygenases, significantly enhanced the toxicity of permethrin to the field strains of German cockroach, suggesting that mixed function oxidases are involved in permethrin resistance (12, 21, 25, 30). Limoee et al., 2007, showed that the synergist s,s,s,-tributylphosphorotrithioate (DEF), an inhibitor of general esterases, affected permethrin resistance of seven field collected strains of German cockroach, suggesting esterases involvement in permethrin resistance. In addition, DDT resistance was not completely eliminated by synergist chlorphenetol (DMC), an inhibitor of glutathione s-transferase enzymes, suggesting that a further non – metabolic resistance mechanism such as kdr – type may be present (30).

3.2. Biochemical studies on insecticide resistance mechanisms of German cockroach

Enayati & Motevalli Haghi, 2007, studied the biochemistry of pyrethroid resistance in some hospital collected strains of German cockroach from Sari, northern province of the country using biochemical assays including general esterases, monooxygenases and glutathione s – tranferases (GST) enzyme assays. The results demonstrated that the mean activity of all enzyme groups in field strains were significantly different from those of the susceptible strain, indicating a vigour tolerance to pyrethroid insecticides (31).

Limoee et al., 2007, studied the permethrin resistance mechanisms in seven field collected strains of German cockroach. The synergistic data supported by biochemical assays implicated that all permethrin resistant strains developed diverse mechanisms of resistance. Indeed, monooxygenases or hydrolases were involved in permethrin resistance in some strains whereas, the results implicated both enhanced oxidative and hydrolytic metabolism of permethrin as resistance mechanisms in the other strains (30).

Since the resistance to permethrin was not completely eliminated by DEF and PBO, and also DDT resistance in 5 strains was not completely eliminated by DMC, the involvement of one or more additional mechanisms in permethrin resistance in every strain studied was implicated (30).

3.3. Target site insensitivity as an insecticide resistance mechanism of German cockroach

Insensitivity of sodium channel to insecticide resulting in knockdown resistance (kdr) has been reported to be a major mechanism of pyrethroid resi-

stance in many German cockroach strains (27,29). There are also indirect evidence of site insensitivity from cross resistance between DDT and pyrethroids, which share the same target sites (32).

Limoee 2006, investigated the presence of kdr-like resistance in a highly DDT and pyrethroid resistant strain by molecular method. It was suggested that kdr mutation was present in the population of German cockroach, at least as heterozygote genotype (33).

Conclusion

As mentioned throughout this study, resistance to different classes of insecticides seemed to be predominated in the populations of German cockroach in many parts of Iran.

1. Requirements for developing good control measures

It is suggested that further studies are necessary for providing further *in vivo* and *in vitro* evidence about potential mechanisms of resistance to different compounds.

Additionally, field trials of insecticide resistance management strategies appear to be essential.

2. Insecticide resistance management strategies

2.1. Rotation

It has previously been reported that there was a negative cross resistance between pyrethroids and organophosphate chlorpyriphos (34). On the other hand, susceptibility of some populations of the German cockroach to chlorpyriphos has recently reported in Iran (20,21).

It was mentioned that the susceptibility to chlorpyriphos could be due to the low application. So, some pyrethroids such as permethrin has recently been replaced with chlorpyriphos, based on their negative cross resistance, for controlling cockroaches (35).

2.2. Mixture of insecticides application

The application of an insecticide until resistance to it is developed can lead to control failure. Thus, some studies conducted on the feasibility and efficacy of mixtures.

Mousavi 2000, showed that some strains of German cockroach were resistant to deltamethrin, tolerant to propoxur and susceptible to primiphos methyl. However, while the mixtures of propoxur + deltamethrin and propoxur + primiphos methyl were much more toxic than any other insecticide alone to German cockroach (13).

2.3. New insecticides applications

As the development of resistance to different classes of insecticides in German cockroach has frequently been confirmed (9, 11, , 12, 14,20 , 21, 22,30,36), the researchers have been considering the susceptibility level of German cockroach to new insecticides.

Nasirian et al., 2011, studied the basic laboratory susceptibility of six pyreyhroid resistant strains of the German cockroach to spinosad. The results indicated that all the strains were susceptible to spinosad. So, efforts to control this pest could include the use of spinosad (37).

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Study of validity and reliability of the scale regarding the expectations about aging

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Abstract

Purpose: This study aimed to examine the validity and reliability of the Survey on Expectations about Aging in the Turkish society.

Methods: This is a methodological study and was performed on 120 people older than 65 years who live in Balçova County in Izmir. Data were collected using a demographic data collection form and the Expectations Regarding Aging (ERA-12). Content validity of ERA-12 was assessed via Kendall W analysis. Item-to-total score analysis was determined using Pearson Correlation. Internal consistency was used Cronbach's Alpha. Confirmatory factor analysis was used to assess construct validity.

Results: The Cronbach's Alpha coefficient was 0.76 for the total scale and 0.51 for physical health subscale, 0.48 for mental health subscale, 0.75 cognitive function subscale. Item-total score correlations were found to be 0.36–0.69 and at a statistically significant level.

Conclusions: The Turkish version of the ERA-12 is a reliable and valid instrument to measure expactations regarding aging.

Key words: Aged, Psychometrics, Expectations of aging

Introduction

As well as the progress in health and social areas in the developed and developing countries within the last 25-30 years, the levels of fertility and death rates decreased, length of life extended and this caused the gradual increase of the elderly population all around the world (Er,2009; State Planning Organization, 2007).

The World Health Organization estimates that the number of people over 65 years of age will be about 800 million by 2025. Moreover, an increase of approximately 300 % is expected for the elderly population, primarily in Latin America and Asia, within the next 30 years. Additionally, while the rate of the younger population is expected to show a decline, the elderly population will double (World Health Organization [WHO], 2009).In Turkey; according to census data from 2008 6.8% of the population is over 65 years of age. (Turkish Statistical Institute [TUİK], 2008). Increases in the elderly population bring with it problems regarding healthcare.

There are numerous studies indicating that older adults elder individuals believe that changes in their health conditions are related to aging aging (Sarkisian, Hays, Berry, Mangione, 2002; Sarkisian, Lee-Henderson, &Mangione, 2003; Kim 2008; Levy, Slade, Kasl, &Kunkey, 2002; Weltzien, 2007). As a result of this thinking, many older adults simply accept their disease symptoms, refuse to seek medical help or to use preventive methods. In some cases, these misconceptions can cause deterioration in their health statush (Sarkisian, Shungkwiler, Aguilar,& Moore, 2006).

In studies on this subject, individuals over 50 years of age who have positive perceptions about aging have a lower probability of death or disease, while persons with lower expectations about aging lead a more sedentary life and have lower usage rates of health services in conditions associated with aging (Sarkisian, et al., , 2002; Sarkisian, Prohaska, Wong, Hirsch, &Mangione, 2005).

Considering the importance of expectations of older adults regarding aging for health conditions and health behaviors, Sarkisian, Hays, Berry, and Mangione (2002) developed a valid and reliable instrument, the ERA 38, for determining the expectations of elders. This scale is consisted of 38 items. Cronbach's alpha for the 38-item version of the scale is 0.80. It has 11 subscales as the general health, cognitive function, mental health, functional independence, sexual function, pain, sleep, fatigue, urinary incontinence and appearance (Sarkisian, Hays, Berry, &Mangione, 2002). Since some of the item

of subscales of the scale were inadequate, Sarkisian et al. reduced the 38 item "Scale of Expectations about Aging" to a 12 item scale, to enhance practicability. Cronbach's alpha for the 12-item scale, was also 0.80. The abbreviated scale consisted of three factors: physical health, mental health and cognitive function (Sarkisian, Prohaska, Wong, Hirsch & Mangione, 2005).

In a study that examined the effect of ethnic differences in expectations about aging (Sarkisian, Shungkwiler, Aguilar, & Moore, 2006) the researchers used the, ERA. As a result of this study, the expectations of the Latin group living in the Los Angeles area regarding aging were determined to be lower, compared to non-Latin whites and African-Americans. The difference was attributed to educational level and the researchers recommended that clinicians working with older individuals with lower educational levels take intercultural differences into consideration (Sarkisian, Shungkwiler, Aguilar, & Moore, 2006). Kim (2008) used the short form (12-item) of the 'Expectations about Aging'scaleto evaluate the relationship between the expectations of N=99 older individuals, age 60 and above, about aging and health-promoting behaviours. Findings emphasized that older persons with high expectations about aging have healthier life styles, with implications for future health. Other studies revealed that expectation individuals about aging are strongly related to their state of health (Levy, Slade, Kasl,& Kunkey, 2002; Weltzien, 2007).

In his study evaluating the health behaviors and aging expectations of individuals using the ERA 12 scale, Weltzien (2007) determined that older women have more negative attitutes compared to younger ones and that younger women have more positive health expectations and inner control, as well as a better state of health.

A psychometrically sound instrument that surveys the expectations of elders about aging enables researchers to examine the relationship between the expectations about aging, health behaviors, service usage and health status in a reliable way. Assessment instruments could be used to determine whether the older adults have low expectations about the aging process and whether or not these expectations prevent them from availing themselves of appropriate health services.

The Survey on Expectations about Aging is a preferred instrument to capture expectations about aging, and has been widely used in research as in English. However, this scale must be adapted for use in Turkish language and Turkish society. Although some of the attitudes toward aging are common across many societies, the tests that are developed in a certain culture and language reflect the qualities of understanding, conceptualization and sample that are peculiar to that culture and language. Thus the same test must be systematically examined, in order to be practicable and significant in other cultures and languages (Ercan & Kan 2004; Gözüm & Aksayan 2002; Karasar, 2000).

Therefore, this study aimed to examine the validity and reliability of the 'Survey on Expectations about Aging' in Turkish society for possible use in future studies.

Methods

Design and Sample

Written permission was obtained from Catherine A Sarkisian to adapt the Expectations Regarding Aging Scale (ERA-12) into Turkish and to use the instrument in this psychometric study. The University of Dokuz Eylul's Ethical Committee reviewed and approved this study for the protection of human subjects. Written approval to conduct the study was obtained from the Izmir Provincial Directorate of Health. Informed consent was obtained from all study participants.

The sample for this psychometric study included 120 people age 65 and older years that live in Balçova County in Izmir. Inclusion criteria for study participants included: a) ability to speak and understand Turkish, b) willingness to participate in the study, c) no hearing or speaking problems, and d) age 65 years and older. Participants' ages ranged from 65 to 86 years with a mean of 71.68 (SD 5, 37). Of the participants, 46 % were male and 54 % female.

Instruments

Data were collected using a demographic data collection form and the Expectations Regarding Aging Scale 12-item version (ERA-12).

Expectations Regarding Aging (ERA-12)

As noted previously, the ERA-12 developed by Sarkisian et al. to measure the expectations of older adults regarding aging. Expectations Regarding Aging (ERA-12) is a shortened survey and containes twelve items. ERA-12 is a summed Likert scale ranging from 1 (Definitely True) to 4 (Definitely False) (Sarkisian, et al., 2005). Scoring for the ERA-12 Survey with 4 items for each of 3 subscales is as follows: physical health (1-4 items), mental health (5-8 items), and cognitive function (9-12 items). Scores obtained from items of each scale are added and four is substracted from this score. The obtained number is multiplied by 25 and then divided by three. A score between 0-100 is obtained for each subscale. For the whole scale, scores obtained from all items are added, 12 is substracted from this number and the obtained number is multiplied by 25 and divided by nine. At the end of these mathematical operations, a score between 0-100 is obtained. Higher scores indicate higher expectations regarding aging. Lower scores indicate lower expectations regarding successful aging. Reliability and validity of the original version of the 12 item scale have been studied by Sarkisian, et al., (2005) yielding a Cronbach's alpha of .79 for the Physical Health subscale, .73 for the Mental Health subscale , .81 for the Cognitive Function subscale ,and .89 for total ERA-12.

Procedures

Translation of the Scale Items into Turkish

The first step of the translation involved forward translation of the original ERA-12 into Turkish by six native speakers of Turkish who spoke English fluently. Turkish versions of the scale were reviewed by the researchers, whose native language was Turkish, and then drafted one Turkish version of the ERA-12. To ensure the accuracy of the translation, the forward-translated version was then back-translated by a professional bilingual translator unfamiliar with either the English or the Turkish version of the ERA-12. The authors of this paper then compared the back-translation with the original ERA-12. If the items or response choices in the forward translated and back-translated instruments did not agree, the choice of words was discussed among the translators until consensus was reached on a final version (Karasar, 2000; Gozum & Aksayan, 2003).

Content validity

Based on the principle that the items of the Turkish form of the inventory should be equivalent to those of the original form, the Turkish form was submitted, along with the original form, for assessment by ten experts (1 family physician, 8 faculty members of a nursing school, 1 clinical nurse) who had a good command of English. The items of the inventory were assessed by these experts in terms of understandability, explicitness, simplicity and conformity to aim and culture and they were scored between 1 and 4 (1=not appropriate, 2=the item should be made appropriate, 3=It is appropriate but needs only small changes, 4=considerably appropriate). Concordance levels of the expert opinions were examined using nonparametric Kendall W analysis. Content validity of the ERA-12 was also assessed via Kendall W analysis of assessment scores given by experts to all items.There were no statistical differences between scores given by the experts for each item (for ERA-12 Kendal W=.076; p = .68) and the experts achieved consensus concerning all items. Thus, no item was excluded from the inventory. After language and content confirmations, a pilot study was conducted with 10 individuals conforming with the sampling criteria and the inventory took its final shape. Pre-application data were not used in the research reported here.

Data collection

Informed consent forms and questionnaire were given to participants by one of the researchers during a home visit. After obtaining written informed consent, questionnaire was administered by the researchers. Data were collected over a period of four months, from May to August 2011. Participants, on average, took 5-10 minutes to complete the questionnaire. The researchers answered any questions and queries fromparticipiants.

Data analysis

Analysis was conducted using descriptive statistics and appropriate reliability and validity statistical tests using the Statistical Package for the Social Services SPSS 15.0 (SPSS Inc. Chicago ILdate).

An expert panel was convened to evaluate content validity of the ERA-12.Using the Kendal *W* statistic, concordance of expert opinions' was tested. Item-to-total score analysis was determined using Pearson Product Moment? Correlations and internal consistency was determined using Cronbach's alpha. Confirmatory factor analysis was used to assess construct validity. Indices to evaluate to degree to which to data fit the model were: x^2 statistics, the ratio of chi-square to degree of freedom (x^2/df), the non-normed fit index (NNFI), the root mean square error of approximation (RMSEA), the standardized root-mean-square residual (SRMR) and the comparative fit index (CFI) (Harrington, 2009; Lobiondo & Haber, 2002; Simsek, 2007).

Results

Descriptive statistics of the ERA-12

Descriptive data for each item of ERA-12 are shown in Table 1. The minimum and maximum scores for each item except the second item of the subscale, were one and four, respectively. The minimum and maximum scores for second item was one and three. The mean value of the items ranged from 1.25 (SD 0.54) – 2.67 (SD 1.03). The total scores ranged from 0- 72.22 with a mean score of 26.42 (SD 15.67). The physical health subscale mean scores ranged from 0-83.33 with a mean score of 18.26 (SD 16.32), the mental health subscale mean scores ranged from 0-83.33 with a mean score of 41.52 (SD 22.46), the cognitive function subscale mean scores ranged from 0-100 with a mean score of 19.30 (SD 20.44).

Validity analysis

Construct validity

Confirmatory factor analysis showed that there was a statistically significant correlation between the physical health subscales and mental health subscales (r = 0,93; see Figure 1), mental health subscales and cognitive function subscales (r = 0,54; see Figure 1), physical health subscales and cognitive function subscales (r = 0,57; see Figure 1). Factor loading of physical health subscale was 0.27-0.68, mental health subscale was 0.38-0.52, cognitive function subscale was 0.37-0.96 (see Figure 1). The model concordance indicators were found to be: x^2 80.51 ($p < .10$), RMSEA 0.062, CFI 0.94, SRMR 0.075 and NNFI 0.92.

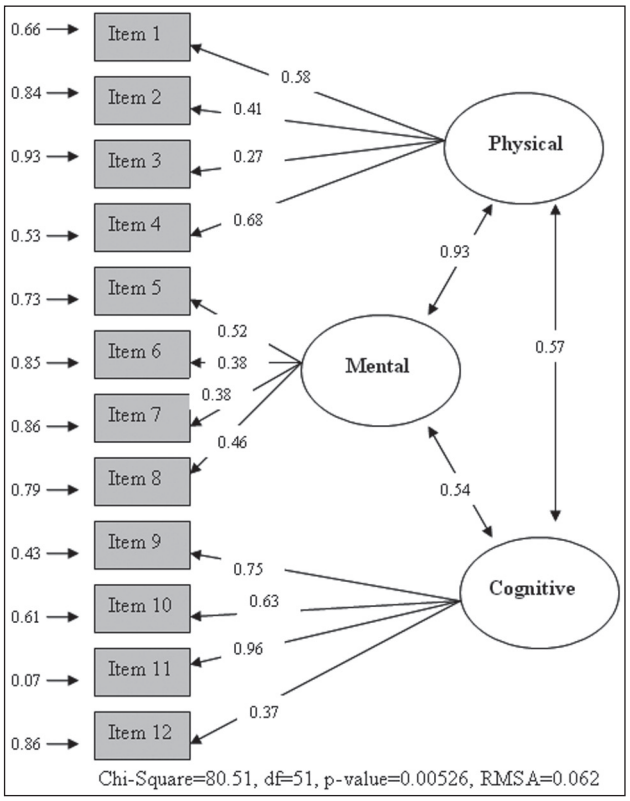

Figure 1. ERA-12 's Confirmatory Factor Analysis Model

Reliability

The Cronbach's alpha coefficient was 0.76 for the total scale and 0.51 for physical health subscale, 0.48 for mental health subscale, 0.75 cognitive function subscale. When the 12-item scale's item-total score correlations were examined to assess instrument reliability, item-total score correlations were found to be 0.36–0.69 and at a statistically significant level ($p < .001$; see Table 1).

Discussion

For an instrument is to be used in a different language it is necessary to demonstrate that it has similar validity and reliability as the original instrument (Patrick & Beery, 1991; Tezbasaran 1997; Sencan 2005). We therefore evaluated the validity and reliability of the ERA-12 for use in a Turkish population. The results of this study support the reliability and validity of the ERA-12 to assess expectations of older people regarding aging in Turkey.

Table 1. Descriptive statistics of ERA-12 and Pearson correlation coefficient between the items and the total scale (n=120)

Item	Item content	M	SD	r	p
1	When people get older, they need to lower their expectations of how healthy they can be.	2.06	1.02	.58	.001
2	The human body is like a car: when it gets old, it gets worn out.	1.25	0.54	.41	.001
3	Having more aches and pains is an accepted part of aging.	1.54	0.52	.36	.001
4	Every year that people age, their energy levels go down a little more.	1.36	0.61	.62	.001
5	I expect that as I get older I will spend less time with friends and family.	2.38	1.14	.57	.001
6	Being lonely is just something that happens when people get old.	2.63	1.10	.47.	.001
7	As people get older they worry more.	1.80	0.89	.49	.001
8	It's normal to be depressed when you are old.	2.67	1.03	.53	.001
9	I expect that as I get older I will become more forgetful.	1.57	0.89	.60	.001
10	It's an accepted part of aging to have trouble remembering names.	1.68	0.82	.49	.001
11	Forgetfulness is a natural occurrence just from growing old.	1.54	0.73	.69	.001
12	It is impossible to escape the mental slowness that happens with aging.	1.53	0.81	.55	.001

Validity

Confirmatory factor analysis is a method used to evaluate whether or not the items are adequately represented in subscales, whether or not the defined subscales adequately explain the scale's original construct and to evaluate whether or not a factor's items' relationships with the factor are adequate (Patrick & Beery, 1991; Sencan, 2005; Simsek, 2007). Additionally, confirmatory factor analysis is used to determine evidence of validity for use of an instrument in a different culture (Buyukozturk, 2002). Results of the subscales of ERA-12 confirmatory analysis factor loading of physical health subscale was 0.27-0.68, mental health subscale was 0.38-0.52, cognitive function subscale was 0.37-0.96 (see Figure 1). The recommendation is that factor loads must be above 0.30. Thus for the ERA-12 confirmatory analysis the scale factor loadings were adequate and consistent with the model. RMSEA values near or below 0.08 point out close fit (Simsek, 2007; Harrington, 2009). In this study the RMSEA value was 0.05, indicating data are consistent with the model. SRMR values below 0.10 CFI and NNFI values close to or higher than 0.90 are indicative of a good fit (Harrington, 2009). In this study SRMR, CFI and NNFI values pointed out a good fit. These results support the construct validity of Turkish version of the ERA-12 and that the instrument is valid for use in the Turkish culture.

Reliability

Reliability is the consistency between independent measurements of the same thing. Following the same procedure, using the same measurement methods and obtaining the same

results means that the measurement is free from random errors (Salkind, 2008). The ERA-12 scale and subscales demonstrated acceptable internal consistency. The Cronbach's alpha coefficient was 0.76 for the total scale and 0.51 for physical health subscale, 0.48 for mental health subscale, 0.75 cognitive function subscale. The Turkish version's Cronbach's alpha value was larger than for Singaporeans (0.7) (Joshi, Malhotra, Lim, Ostbye, & Wong, 2010). The total scale and subscales were reliable for internal consistency. To determine the degree to which an instrument's items are associated with the entire instrument, the correlation coefficient of item analysis was used (Tezbasaran, 1997; Sencan, 2005). Getting a high correlation coefficient for each item demonstrates that item is highly connected with the theoretical construct being measured, or that the item is influential and adequate to measure the targeted behavior. It is suggested that the item coefficient be higher than 0.20 or 0.25 (Patrick & Beery, 1991; Tezbasaran, 1997; Sencan, 2005). The item-total score correlations for the ERA-12 using correlation coefficients (Pearson's Product–Moment Correlation) were 0.36–0.69 ($p < .001$; see Table 1), for the phsical health subscale were 0.36–0.62, the men-

tal health subscale were 0.47-0.53, the cognitive function subscales were 0.49-0.69 ($p < .001$), and statistically significant. All of the items of the ERA-12 demonstrated adequate correlations with their own subscale's total score and the subscales' item reliability was high ($p < .001$). The item-total score analysis is as much an confirmation of reliability as it is an indication of validity (internal consistency) displaying the scale's construct validity as well (Tezbasaran, 1997; Sencan, 2005).

Conclusion and Clinical Nursing Implications

The Turkish version of the ERA-12 is a reliable and valid instrument to measure expactations regarding aging. The psychometric properties of the original version of the ERA-12 were preserved. Psychometric analysis of the Turkish version of ERA-12 indicates high reliability (internal consistency) and good content and construct validity.

Relevance to clinical practice This study provides evidence that the Turkish version of the ERA-12 is a reliable and valid instrument for assessing expectations of older people regarding aging. It is easy and practical to use for both informants and investigators and appropriate for the Turkish Culture and Turkish language. Turkish version of ERA-12 can use for all people who speak Turkish in the world. In this way it will facilitate cross-cultural comparisons and culture-oriented care planning.

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Comparison of clinical-epidemiologic characteristics and consequence of flu-like and H1N1 influenza in Markazi Province, Iran, 2009-2010

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Abstract

Background: Influenza is a disease with global public health significance which causes the pandemic of 2009 by the novel agent of recombinant of genes from pig, bird, and human flu viruses.

Aim: to determine and compare the frequency of epidemiological as well as clinical symptoms of the disease in flu-like and H1N1 patients.

Material and Methods: Setting and design - This epidemiologic investigation was performed on 1452 patients suspected with H1N1 from September 2009 till the end of March 2010 in Markazi province, Iran.

The data including the clinical symptoms and the epidemiologic characteristics were collected through medical documents and interview with the patients or their relatives. Case fatality rate (CFR) and incidence rate were calculated for the two diseases.

Results: H1N1 Influenza was confirmed in 12.6% (183 cases) of the patients under study. The CFR estimation of H1N1 was 4.37% and approximately 28 fold that of Flu-like. Moreover and age adjusted case fatality rate and the mortality increased by age. Over half of the patients (51.4%) were hospitalized. Besides fever, myalgia, and cough symptoms existed in 90.5%, 84.2%, and 84% of the patients, respectively. The mean age of the H1N1patients was significantly higher than that of the Flu-like ones.

Discussion: Based on our data, CFR in the patients under study is higher than the average of Iran and Eastern Mediterranean Regional Office (EMRO) which highlights the role of the rapid surveillance system in diagnosis of Influenza. So, regular monitoring of the disease and highlighting the role of public health trained workers for emergency efforts and medical management are recommended.

Key words: H1N1, Flu-like, Influenza pandemic, Iran

Introduction

Influenza is a disease with global public health significance which has caused 2009 pandemic of novel swine-origin H1N1 [1]. Swine influenza was detected in 1930 for the first time and has caused periodic outbreaks among humans. However, its cases were uniform in the lack of human-to-human transmission and were clinically indistinguishable from seasonal influenza[2]. An outbreak of H1N1 influenza virus infection occurred in Mexico in late March and early April of 2009 for over several weeks and subsequent local community-wide transmission cases were observed in several other countries. The new agent of this pandemic was recombinant of genes from pig, bird, and human flu viruses which had not been seen previously elsewhere[3]. Since September 13, 2009, there have been over 296,471 virologically confirmed human cases with novel swine-origin influenza virus- also known as H1N- which resulted in at least 3,486 deaths worldwide[4]. Almost five months after the appearance of the first cases, the pandemic H1N1 infection continued to spread worldwide with a high rate of human transmission and led to serious complications as well as mortality[5].

The major causes of influenza worldwide are type A influenza viruses. In addition, the A/H1N1 subtype is the most common type found in the younger population[6]. Influenza virus causes regular outbreaks with recurrent epidemics as well as global pandemics and accounts for considerable morbidity and school absence; among healthy

children and adolescents [1, 7]; of course, the severity of outbreaks varies[7]. The mortality of seasonal epidemics is highest in the elderly, while mortality during pandemic influenza is highest in the younger age groups. This shift of mortality toward younger age groups is considered as a significant feature of pandemics[8].

Epidemiologic features of the virus differ from seasonal viruses[2, 4, 9]. Based on primary studies in Brazil, H1N1tends to infect younger people and the reported cases had a median age of 26 years. Most patients were between 15-49 years old. Also, 57.5% of the confirmed cases are of female sex.4. In another study, 40% of the patients were between 10–18 and 60% were under 18 years old [9]. Clinical signs of the disease include low or mid-level fever, cough, headache, rhinorrhoea, sore throat, vomiting, and diarrhea[2, 9-10].

In order for the treatment to be clinically effective, early administration is important by application of Neuraminidase (NA) inhibitors, Zanamivir, and Oseltamivir -effective drugs against influenza A and B viruses- within the first 12 hours of the disease onset, although drug resistance to NA inhibitors has been reported recently [11]. Also, European agencies reported that 14% of H1N1 influenza A during the 2007–2008 season were resistant to Oseltamivir[12].

Following the last Pandemic Influenza in 2009, it arrived in Iran and Markazi province. Based on the overall reported H1N1cases, this province has a higher incidence rate than other provinces except Qom[13]. Therefore due to the significance and severe outcome of the disease, we collected demographic data, clinical symptoms, and the consequences of flu-like disease in Markazi province, Iran and compared the characteristics of confirmed and unconfirmed H1N1 patients. Consequently, the present research aims to determine and compare the frequency of epidemiological and clinical symptoms of the diseases in flu-like and H1N1 patients.

Material and Methods

Study area

Markazi province is one of the central provinces of Iran which consists of ten cities. Arak is the largest city and the center of the province. The study area is 29530 km2 of Iranian territory and contains 1.9% of the Iranian population. It lies at 293 km southwest of Tehran, the capital of Iran.

Participants and patients

The present epidemiologic investigation was on 1452 suspected patients who had been referred to Control of Diseases Center (CDC) of vice-chancellor of health and the head of health surveillance network in Markazi province, due to influenza virus infection from September 2009 until the end of March 2010. The inclusion criteria of the study were fever>38o C, or at least two acute respiratory infection symptoms such as cough, rhinorrhea, sore throat, and fever and general symptom like headache, myalgia, exhaustion, and shivering[13]. Therefore, in case the patients did not have these criteria, they were excluded from the study.

Data collection

Data were collected by evaluating the medical documents of inpatients and outpatients at the infectious unit of the hospital and also interview with the patients and, if it was not possible, with their relatives. Then, they were registered in the pre-coded checklist. The checklist contained three separate sections. The first section included demographic variables as well as age, gender, occupation and living place of the patients. The second section contained disease features such as the clinical symptoms, medical history of morbidity, and history of contact with an individual with H1N1 virus infection. The third section involved either general treatment practices including administration of acetaminophens and codeine for relieving fever and pain or specific treatment practices such as the administration of Zanamivir and Oseltamivir.

Participants of this study were those who had referred to the hospitals, clinics, para-clinics, and rural and urban health centers and had the inclusion criteria, based on the guideline of the influenza disease. So we include the patients based on two method; the hospital-base approach for the inpatient subjects and the community-base for the outpatient ones. The samples collection of suspected patients was done in the infectious unit of the admitted hospital and in the urban and rural health centers for inpatient and outpatient subjects, respectively. These samples were sent to the virology department of Tehran University of Medical

Sciences for final confirmation. The novel H1N1 cases were confirmed using real-time reverse transcriptase polymerase chain reaction test. The patient's data such as age, sex, treatment, consequences of influenza, and the outcomes of the diseases was gathered in the referrer center or the hospitalized ward and was checked in the CDC of vice-chancellor of health again

Statistical analysis

After data collection and confirmation of the diagnosis, the data were analyzed in Med Cal (V.8) and SPSS (V.13) software. Statistical analyses included descriptive statistics with mean values and percentage. In addition, comparison between the two groups of the patients was conducted using Chi-square and Fisher exact tests. Case fatality rate (CFR) and incidence rate were calculated in all as well as the two groups of the patients.

Results

The mean age of all the patients was equal to 33.4±22.16 years. Moreover 53% (770 cases) of the patients were of female sex. From female patients, 5.32% (41 cases) were pregnant, one of whom died. The relative age–sex distribution of patients is shown in Figure 1 which shows that the majority of the patients were less than 30 years old. Of 1452 reported and referred patients to CDC of vice-chancellor of health, more patients were female and were less than 45, 21.5% were in the age group less than 14.9, 33.4% in 15-29.9, and 17.3% in 30-44.9.

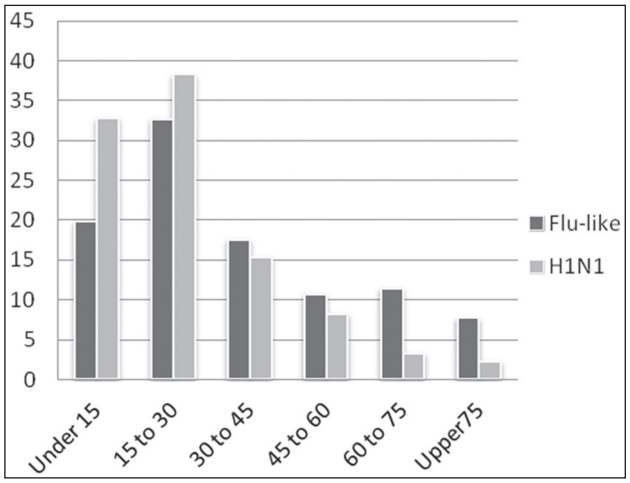

Figure 1. Age relative frequency of the two types of the diseases in the studied patients

The reverse transcriptase polymerase chain reaction test confirmed 183 cases (12.6%) of H1N1 Influenza. Eight deaths occurred in the H1N1 patients, while two occurred in the flu-like ones. Therefore, the CFR estimation of H1N1 was approximately 28 fold that of Flu-like. The result appear in Table 1 which shows a significant difference between mean age of the two groups of the patients (34.65±22.49 V.S 24.78±17.49, $p<0.0001$). Also a significant trend was observed in the incidence of H1N1 ($\chi 2 =71.6$, $p<0.0001$) and Flu-like ($\chi 2 =24.7$, $p<0.001$) patients among the age groups. Nevertheless this trend in the H1N1 group was more descending than the Flu-like one.

As table 2 depicts, that the history of contact with flu patients, Saudi Arabia passengers, and birds was 2.9%, 0.2%, and 1.1%, respectively and the clinical symptom among the patients were higher than 84%. The age adjusted case fatality rate is presented in Figure 2 which shows that the mortality increases by age. The results of the incidence rate distribution, according to the city of residence, revealed that the highest incidence of the Flu-like disease is reported from Mahallat, while the highest incidence of the H1N1 cases is reported from Ashtian.

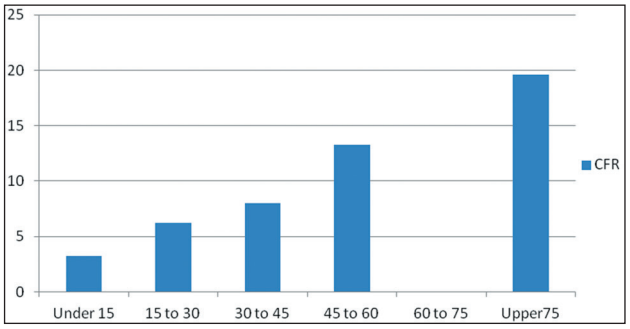

Figure 2. Age adjusted case fatality rate (per 1000) in the studied patients

Over half of the patients (51.4%) were hospitalized and admitted to the infection control wards of the province hospitals. Fever, myalgia, and cough symptoms existed in 90.5%, 84.2% and 84% of the patients, respectively. According to our findings, 2.60% of the hospitalized patients experienced the consequences of the disease such as encephalopati (0.1%), vertigo (2.1%), and diarrhea (1.7%). Also, 71% used medication, most of whom (92%) used Osletatiomer. Moreover 11.2%

Table 1. Distribution of age and sex of Flu-like and H1N1 patients

		Total	Flu-like N=1269	H1N1 N=183	P value
Mean age		33.4±22.16	34.65±22.49	24.78±17.49	<0.001
Sex	**Female**	770(53)	681(53.7)	89(48.6)	0.116
	Male	682(47)	588(46.3)	94(51.4)	
Age Group	**<15**	312(21.5)	252(19.9)	60(32.8)	<0.001
	15-29	485(33.4)	415(32.7)	70(38.3)	
	30-44	251(17.3)	223(17.6)	28(15.3)	
	45-59	151(10.4)	136(10.7)	15(8.2)	
	60-74	151(10.4)	145(11.4)	6(3.3)	
	≥75	102(7)	98(7.7)	4(2.2)	

Table 2. Clinical history and symptoms of Flu-like and H1N1 patients

		Total n (%)	Flu-like N=1269	H1N1 N=183	P value
History of contact with	**Flu Patients**	42 (2.9)	37 (2.9)	5 (2.7)	0.561
	Saudi Arab passenger	3(0.2)	3(0.2)	0	----
	Bird	14(1.1)	14(1.1)	0	----
Symptom	**Fever over 38° C**	1314(90.5)	1141(89.9)	173(94.5)	0.026
	Myalgias	1222(84.2)	1073(84.6)	149(81.4)	0.164
	Cough	1220(84)	1057(83.3)	163(89.1)	0.026
	Hospitalized	746(51.4)	636(50.1)	110(60.1)	0.007
	Death	10(0.7)	2(0.157)	8(4.37)	<0.0001

of the patients had background diseases and it was found that there is a meaningful relationship between the age group and the pain as a result of the disease consequences.

Discussion

The 2009 influenza pandemic affected all 22 EMRO countries and helped to increase the recognition of influenza as an important public health issue. Moreover it caused more attention to be paid to the clinical presentation of seasonal influenza viruses circulating among people during the pandemic. The infection spread in all countries as well as Iran with a high speed, causing 1425 cases in Markazi province in a period of six months. Rapid detection of influenza pandemic is a public health issue of critical importance because of the huge mortality and morbidity of the disease at national or regional level8. Therefore surveillance, treatment, and follow-up of the diseases led to the reduction of severe sequences and the burden of the disease in Iran and, particularly in Markazi Province. Although the CFR in our study was 7 per 1000 individuals in all patients and 43.7 per 1000 cases in the H1N1 patients, it is higher than the CFR from Iran[13] and reports of EMRO[14]. However, several studies noted that the measurement of CFR in early pandemic is very difficult and can lead to a biased estimation[15-16]. The patients with mild disease were carefree and did not refer to health centers or medical offices and hospitals. Therefore another consideration for the high CFR in our study is related to low knowledge of people about this important disease.

The mean age of the two patient groups was significantly different and the H1N1 patients revealed to be younger. Also, our results showed that the occurrence of the disease in those less than 30 years old was higher than the other age groups and that the age trend of H1N1 was decreasing. Other studies also came to the same conclusion 3, 17-19. Based on the recent studies, children have the highest incidence of influenza infection and are at

high risk of severe diseases when being infected by wild-type influenza viruses [6, 19]. However age adjusted case fatality rate did not show the same results, which is in line with another review study[4].

Based on our results, most confirmed cases of H1N1 influenza and flu-like influenza had similar symptoms regarding myalgias, while fever and cough symptoms and hospitalization were higher in the flu-like patients compared to the H1N1 ones. Although the existence of severe clinical features in these patients affect hospital admissions, the percentage of the studied symptoms was not clinically significant between the two patient groups and differential diagnosis of them can be done through laboratory tests. These finding are similar to the results of the study conducted by Vandijck et al.[5]. Also, the consequences and severe outcomes of the disease in this study were lower than our expectation based on the recent Influenza modeling in Iran[20]. Another study[21] mentioned that the common features during the previous epidemics are related to age. Moreover since most of the studies which have described the clinical features of the disease are hospital based, these symptoms and consequences were exaggerated. Therefore, one can conclude that fewer severe outcomes in our study are due to fewer hospitalized cases.

From the public health perspective, however, it is essential to vigilantly monitor the present pandemic since any changes in the transmissibility and drug resistance of the virus will have profound implications in the clinical case management. The first resistance to Oseltamivir in EMRO was reported in Yemen. Therefore, there is a need to plan for surveillance systems in case finding and also virological surveillance in Iran as well as the other countries in the region[14]. In order to achieve this goal, educational programs, training the health care workers, and correct decision making in medication must be reviewed and reformed. Also, post-pandemic period of surveillance is crucial to provide information for on-time detection of epidemic or pandemic changes in circulating virus behaviors as well as making informed decisions on health policies and clinical management [22].

The major limitation of this study was failure in referring the suspected patients to CDC. However, although the incidence rate of the disease in Mahallat, Khomein, and Tafresh was higher than that in other cities, the imported patients could have affected these rates. Moreover, since Saveh is close to Qom and Tehran, and Delijan is near Esfahan and Qom, some patients might have traveled to neighborhood cities for medication and treatment. Another limitation of this study was weaker surveillance of non-hospitalized patients. In fact, since the consequences of the disease in such patients were reported less than other admitted patients, it leads to limitations for our comparisons.

Conclusion

The present research shows that the CFR in the population under study is higher than the average of Iran and EMRO which highlights the role of rapid and active surveillance system in diagnosis of Influenza. It is recommended that regular monitoring of the disease be increased and the role of trained public health workers be highlighted. Moreover instructions for drug use and interventions in preventing the medicinal differences are among the most effective strategies for controlling all the influenza disease sub-types.

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Burnout and job satisfaction in surgical nurses and other ward nurses in a tertiary hospital: A comparative study in Turkey

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Abstract

Aim: Job dissatisfaction and burnout have a negative effect on health care providers, especially nurses. This often results in a shortage of qualified personnel as well as a decrease in the quality and level of care provided to patients. This study carried out to describe the level of burnout and job satisfaction among surgical nurses and to compare them to nurses working in other wards in terms of these aspects.

Methods: The study was designed as a cross-sectional and descriptive survey. The sample of the research consisted of 330 nurses working in a tertiary hospital in the northeastern part of Turkey. A questionnaire form, Minnesota Job Satisfaction Questionnaire and Maslach Burnout Inventory were used in order to collect the data. The student t test in independent variables, ANOVA, and Pearson's Correlation Coefficient were used in order to analyze the data.

Results: Study results indicated that surgical nurses experienced emotional exhaustion more than pediatric nurses. They had higher levels of depersonalization than the policlinic and gynecological nurses. It was also found that nurses working in operating rooms and urology units experienced more emotional exhaustion than other surgical nurses.

Conclusion: The study results showed that the state of emotional exhaustion and depersonalization of the surgical nurses was higher than the means of nurses working in other wards and job satisfaction and personal accomplisment were similar.

Key words: Burnout, job satisfaction, nursing

Introduction

Burnout is defined as a specific type of professional stress among human services professions, resulting from the demanding and emotionally charged relationships between caregivers and recipients. Burnout is divided into three categories: emotional exhaustion, depersonalization, and lack of personal accomplishment [1].

Emotional exhaustion (EE) is the key aspect of the syndrome, and those affected feel emotionally worn out and overburdened. Depersonalization (DP) involves being negative, cynical and, overly detached. Additionally, it and is further expressed through impersonal attitudes and feelings toward other individuals. Lack of personal accomplishment (PA) is described as the individual's tendency to evaluate oneself negatively, comparing themselves to others, resulting in a decreased feeling of job efficacy and accomplishment [1,2].

Many studies have found that professional burnout caused such psychological problems as depression, anxiety, helplessness, hopelessness and physiological problems as chronic body pains, temporary muscle spasms and sleep disorders. In addition, there are negative social and familial outcomes of exhaustion, such as a decrease in professional efficacy, productivity, and job satisfaction, being late for work, work absenteeism with dishonest excuses or quitting the job as a result of burnout. Thus, the loss of experienced and qualified personnel becomes an institutional consequence of the burnout [3,4,5,6].

Hospitals differ from other professional environments in that they are highly stressful environments for the health employees. Each day health teams encounter the pains, sorrows, regrets and deaths of those patients and families whom they have tended [7]. Among health care personnel the nurses, in particular, are at risk for the burnout experience just because of the nature and the emotional demands of their profession [8,9,10]. A study conducted in

Turkey reported that nursing was the most stressful job within the health care team [11].

Adali and Priami [12] say that "Burnout develops as a response to chronic emotional strain, resulting from a deterioration of relationships between the nurse and the patients, the co-workers, the family, and the social environment". Factors within the nursing profession leading to such strain result from long working hours, requirements to work night shifts or at the weekend, and different and burdensome responsibilities. Another important stressor is the necessity that nurses develop an essentially complicated relationship with the sick person, his/herfamily and other health care personnel who are also under stress as they are [7,10,13,14].

Burnout is closely connected to work absenteeism and eventually leaving the work altogether. Vahey, Aiken, Sloane, Clarke and Vargas [15] reported that 40% of hospital nurses suffer from burnout and one in five hospital nurses considers leaving work within the next year. Loss of experienced personnel results in reduced quality of patient care [8,16,17].

Various relevant sources emphasize that job satisfaction and burnout affect each other and job satisfaction can be utilized as an indicator of burnout [14,18,19,20]. Job satisfaction, a personal attitude towards the job, is the positive emotional state that workers experience when they have reached their professional goals and expectations. Decreased job satisfaction negatively affects the physical, psychological and social health of the individual and reduces the quality of work, leading the individual to leave the work entirely [14,20,21].

An extensive review of the empirical literature by Lu, While and Barriball [22] revealed that job satisfaction of nurses is related to many factors to include: working conditions; relationships within the workplace; the work itself; praise and recognition; remuneration; personal growth and promotion; responsibility and job security; as well as leadership styles and organizational policies [23,24]. Nurses'professional commitment, role ambiguity and role performance are only moderately related to job satisfaction [20,25].

Nurses retreat from themselves, patients and the profession when they perceive a failure concerning their jobs [26,27,28]. Since the nurses provide a unique contribution within the multidisciplinary team, job satisfaction is reflected in the quality of the care. Conversely, dissatisfaction with the job affects the nurse-patient relationship negatively [24,29,30].

There are many factors that cause burnout and dissatisfaction with the job, and it is very important these be recognized and dealt with effectively so that the physical and psychological health of nurses can be protected. Programs which address the effects of burnout on nurses can enhance their work performance and increase their satisfaction in the workplace.

Studies have been done examining the state of burnout and job satisfaction of the nurses. Yet, there are limited number of studies to evaluated the burnout and job satisfaction of surgical nurses by comparing them to other nurses working in different clinics. This study was conducted as a descriptive and cross-sectional study for the purpose of determining the level of burnout and job satisfaction among surgical nurses and to compare them to nurses working in other wards in terms of these aspects. The study addressed the following research questions:

1. What is the state of the burnout and job satisfaction of the nurses who work in the surgery and other wards?
2. Is there any difference between the nurses working in the surgical departments and those working at other departments in terms of burnout and job satisfaction?
3. What are the variables that affect the state of burnout and job satisfaction of the surgical nurses?

Materials and methods

Sample

The population of the study consisted of 350 nurses who worked at a tertiary hospital. The entire population was included in the study, and 330 nurses agreed to join the study. Twenty nurses did not fill in the forms completely and were excluded from the group. The participation rate of the study was 94.2% and answer ratio of the questions was 96.6%.

Data Collection

Study data were collected with questionnaire-developed by the researchers based on the litera-

ture and scales (Minnesota Job-Satisfaction Scale, Maslach Burnout Inventory).

Instruments

1. Socio-demographic characteristics and working conditions questionnaire

The questionnaire containing 10-item was designed by the researchers in order to identify socio-demographic characteristics (age, marital status, bachelor's degree, etc.) and working features (work years, shift patterns, etc.) of the nurses.

2. Minnesota Job-Satisfaction Scale

The scale was designed by Weiss, Dawis, England and Lofquist in 1967 [31]. It was translated into Turkish by Baycan [32]. Its reliability and validity tests were carried out (Cronbach Alfa=0.77). It is a Likert-type scale with 20 items that reveals internal andexternal factors associated with job satisfaction and has a scoring system from 1 to 5.

The scale reveals scores of general, internal and external satisfaction. A score of general satisfaction is obtained by dividing the total scores of the items into 20, maximum score is 5. In our study, we used scores of general satisfaction but did not use a cut -off- point. The Cronbach alpha value was 0.66 inthis study.

3. Maslach Burnout Inventory (MBI)

It was designed by Maslach and Jackson [1]. The inventory has 22 questions and measures burnout under three subscales: PA (4,7,9,12,17,18,19,21), DP (5,10,11,15,22) and EE (1,2,3,6,8,13,14,16,20). It was translated into Turkish by different authors. Its validity and reliability tests were carried out [11,33]. In the study of validity and reliability by Cam [33]conducted with 135 subjects, the Cronbach alpha value was computed as 0.81 forEE, 0.70 for DP and 0.77 for PA, respectively.

The MBI originally had 7 answers but was changed into 5 answers due to its unsuitability for the Turkish culture (0=Not at all, 1=Rarely, 2=Sometimes, 3=Often, 4=Very often). Subscales are scored in the way explained above for emotional exhaustion and depersonalization; it is scored vice-versa for personal accomplishment (4= never and 0= always). Each subscale is scored and assessed separately. After the addition of these scores, the total score for emotional exhaustion ranges from 0 to 36, for depersonalization from 0 to 20 and for personal accomplishment form 0 to 32. Since the cut-off value is not present for the scores of the scale, we cannot conclude whether exhaustion is present or absent.

A high score for emotional exhaustion and depersonalization and a low score for personal accomplishment means a high level of exhaustion. In our study, Cronbach alpha values for subscales were computed as 0.68 for personal accomplishment, 0.62 for depersonalization and 0.78 for emotional exhaustion, respectively.

Procedures

Questionnaire, Minnesota Job-Satisfaction Scale and MBI were distributed to nurses by researchers. The questionnaire and scales was filled out by the nurses and gathered.

Ethical Considerations

Written permission from the hospital directorate and participants was obtained. For confidentiality reasons, no personal information, such as name and surname, was recorded on the form. The freedom to withdraw from the study was ensured. The respondents' right to privacy was guaranteed during the data collection phase.

Analysis

The dependent variables were job satisfaction and burnout. While, the independent variables were age, marital status, bachelor's degree, total working year, working year for the current clinic, the fact whether they themselves chose the clinics or not, and the shift pattern at the clinic.

The data were analyzed using Statistical Package for the Social Sciences for Windows software application program version 13.0. The ANOVA and Pearson's Correlation Coefficient were used as a statistical analysis method and as a significance test between two means. The statistical significance was determined as $p<0.05$.

Results

Demographic characteristics

The percentage of participating nurses were 32.7%, 21.7% and 16.2% working in the surgery clinics, internal medicine clinics and at intensive-

care units, respectively. 53.4% of the nurses had a bachelor's degree, and 36.2% had an associate's degree. The mean age of the nurses was 29.4±5.0 (Mean±SD) years. The mean total working year was 7.6±6.4(Mean±SD). While, the mean working year for the current clinics was 4.3±4.5 (Mean±SD).

Half of the surgical nurses had a bachelor's degree (54.5 %). The mean age of the surgical nurses was 28.5±4.6 (Mean±SD) years. The mean number of years working in nursing was 7.0±6.0 (Mean±SD). Additionally, the mean number of years working for the current clinics was 4.7±5.0 (Mean±SD). Administrative decisions accounted for 65.3% of the surgical nurses'appointments to the surgical departments.

Burnout and job satisfaction of the nurses according to the departments

According to Table 1, the levels of EE of intensive-care unit nurses (11.1±4.7; Mean±SD) and psychiatric nurses (11.0±7.4; Mean±SD) were higher than the others. Again, intensive-care unit nurses experienced DP more than the others (12.6±3.1; Mean±SD). The highest PA scores were obtained from psychiatric nurses (13.8±3.6; Mean±SD). The job satisfaction levels of gynecological and pediatrics nurses (3.7 ±0.3; Mean±SD) were higher than the other nurses. When we compared the nurses according to the department in which they were employed, we found that the difference between the state of EE and DP of the nurses was significant in terms of the department in which they worked (p=0.003 and p=0.001). Yet, the difference between PA and job satisfaction was insignificant (p>0.05) (Table 1).

We discovered that the state of EE and DP of the surgical nurses was higher than all of the nurses. Job satisfaction and PA were similar. There was a significant difference between surgical nurses and pediatric nurses in EE (p=0.001) and DP (p=0.018). Whereas, a significant difference existed for DP between surgical nurses and gynecological nurses (p=0.014) and policlinic nurses (p=0.003). Study results also showed that PA and job satisfaction of the surgical nurses were not statistically different from the other nurses (p>0.05) (Table 1).

Burnout and job satisfaction of the surgical nurses according to the departments

In Table 2, the state of burnout and job satisfaction of the surgical nurses was compared according to the departments in which they worked. There was a significant difference between the surgical nurses in terms of job satisfaction and EE according to the type of department (p=0.007), while no difference was present between PA and DP (p>0.05). It was seen that urological nurses (12.4±5.3; Mean±SD) and operating room nurses (12.3±4.8; Mean±SD) experienced the highest EE among surgical nurses.

Table 1. The Distribution of the State of Burnout and Job Satisfaction of the Nurses According to the Departments in which They Worked (n=310)

Departments	n	Subscales of Burnout			Job satisfaction (Mean±SD)
		Emotional exhaustion (Mean±SD)	Depersonalization (Mean±SD)	Personal accomplishment (Mean±SD)	
Surgical clinics	102	10.1± 4.7	7.0± 3.0	11.7± 3.4	3.6± 0.5
Internal Medical Clinics	67	8.8± 4.3	6.8± 3.0	11.8± 4.4	3.6± 0.4
Pediatrics	19	6.3± 3.2	5.2± 3.1	11.7± 3.0	3.7± 0.3
Psychiatry	6	11.0± 7.4	5.6± 2.5	13.8± 3.6	3.3± 0.4
Emergency Room	19	9.1± 3.2	6.6± 2.5	11.5± 2.3	3.7± 0.2
Gynecology and Obstetrics	14	9.2± 2.6	9.2± 2.2	10.2± 2.5	3.7± 0.3
Intensive Care	50	11.1± 4.7	12.6± 3.1	12.6± 3.6	3.5± 0.5
Polyclinics	33	10.6± 3.8	10.5± 2.2	10.5± 3.7	3.6± 0.4
General means of the nurses	310	9.7± 4.5	6.6 ± 3.0	11.7± 3.6	3.6± 0.4
Statistical Analysis		p=0.003	p=0.001	p=0.171	p=0.142

The highest level of job satisfaction was found in the nurses of the general surgery department (4.0±0.5; Mean±SD). Cardiovascular surgery nurses experienced DP more than the other surgery nurses (8.7±3.8; Mean±SD),although the data was not being significant. We found that general surgery nurses had the lowest levels of PA (10.0±4.9; Mean±SD) (Table 2).

Correlations between Burnout Sub-Dimensions, Job Satisfaction and Predicting Variables for Surgical Nurses

Pearson correlation coefficients were computed between burnout sub-dimensions, job satisfaction and predictor variables for surgical nurses (Table 3). Among selected individual characteristics, a bachelor's degree was significantly related with PA (p=0.013), EE (p=0.016), and job satisfaction (p=0.009). Nurses with a bachelor's degree expe-

Table 2. The Distribution of Burnout and Job Satisfaction of the Surgical Nurses According to the Departments in which They Worked (n=102)

Departments	n	Subscales of Burnout			Job satisfaction (Mean±SD)
		Emotional exhaustion (Mean±SD)	Depersonalization (Mean±SD)	Personal accomplishment (Mean±SD)	
Neurosurgery	12	7.3± 4.2	5.3± 2.3	12.5± 3.1	3.5± 0.5
Otolaryngology	11	10.1± 2.9	6.2± 2.8	10.9± 2.4	3.4± 0.3
Operating Room	19	12.3± 4.8	7.6± 3.2	12.4± 3.2	3.3± 0.6
Cardio vascular Surgery	4	10.5± 3.4	8.7± 3.8	14.2± 2.6	3.2± 0.3
Urology	11	12.4± 5.3	7.9± 2.2	11.8± 3.6	3.7± 0.3
General Surgery	17	8.2± 4.1	6.4± 2.7	10.0± 4.9	4.0± 0.5
Orthopedics	11	8.9± 4.2	6.8± 3.4	11.3± 2.6	3.4± 0.5
Ophthalmology	8	9.1± 4.9	7.2± 2.7	12.3± 3.3	3.7± 0.3
Cardio vascular intensive care	9	10.4± 4.1	7.3± 2.5	10.8± 2.9	3.2± 0.5
General means of the nurses that worked out of surgical clinics	208	9.5±4.3	6.4±2.9	11.7±3.7	3.6±0.4
Statistical analysis		p=0.031	p=0.148	p=0.358	p=0.007

Table 3. Correlations between Burnout Sub-Dimensions, Job Satisfaction and Predicting Variables for Surgical Nurses (n=102)

Predictors	Subscales of Burnout			Job satisfaction
	Emotional exhaustion	Depersonalization	Personal accomplishment	
Age	0.084	0.082	0.053	-0.075
Marital status	-0.056	-0.110	-0.047	-0.060
Bachelor's degree	-0.265**	-0.129	-0.248*	0.304**
Working time (year)	0.150	0.173	0.067	-0.109
Department	-0.093	0.000	-0.068	0.192
Working time (year) for the current department	0.1154	0.091	0.066	-0.123
Appointment type to the department	-0.101	-0.052	0.128	-0.061
Working type	0.028	0.114	0.154	0.082
Emotional exhaustion	-	0.532**	0.190	-0.386**
Depersonalization	0.532**	-	-0.090	-0.040
Personal accomplishment	0.140	0.102	-	-0.233*
Job satisfaction	-0.386**	0.040	-0.297**	-

** p<0.05 **p <0.01*

rienced less PA and EE but higher job satisfaction (Table 3).

Discussion

Surgical clinics are where patients come with acute problems such as trauma, shock and surgical emergencies or other operations. The study was conducted in order to determine whether the state of burnout and job satisfaction of the nurses caring for these patients was different from the nurses working in other departments. The burnout and job satisfaction of the surgical nurses were compared to that of the nurses of other departments.

It was determined that the department in which nurses worked affected their state of EE and DP in our study. However, it did not affect PA and job satisfaction. Our study showed that nurses in intensive-care units experienced EE and DP more than the other nurses (Table 1). It was an expected result for the intensive care nurses who are continuously engaged with critically ill or unconscious patients and often lose them. The study of Gillespie and Melby [34] yielded different results from ours. It showed that burnout did not differ among the nurses according to the departments where they worked. Some studies pointed out that psychiatric nurses experienced EE more than the nurses of other departments [8,35].

Another research topic investigated in this study was whether there was any difference between surgical nurses and nurses of other departments in terms of burnout and job satisfaction. Surgical nurses and nurses working at other departments were compared in pairs in our study. It was discovered that surgical nurses experienced EE and DP more than pediatric nurses. Again, surgical nurses experienced DP less than gynecological and policlinic nurses.

We found that surgical nurses were not different from other nurses in PA and job satisfaction. There was a study [36] demonstrating that there were no differences in burnout levels between the surgical nurses and the nurses of internal medicine departments. The study of Taycan, Kutlu, Cimen and Aydın [37] found that the PA levels of surgical nurses were higher than the other nurses working at internal medicine departments, but there was not any difference between other subscales. However, another study [38] has reported differences in the PA scores between surgical nurses and nurses working in public health. In the study of Sahraian, Fazelzadeh and Mehdizadeh [8] demonstrated that only a small number of the nurses had a higher PA score (2.2 %).

Furthermore, in the present study, surgical nurses were compared in terms of burnout and job satisfaction according to the departments in which they were employed. Their job satisfaction and EE varied significantly according to the departments in which they were employed, but their state of PA and DP were the same. The urology and operating room nurses experienced emotional exhaustion more than the nurses of other surgical departments. The highest job satisfaction levels were those of the nurses working in the general uurgery departments.

In our study, having a bachelor's degree significantly affected the PA, EE and job satisfaction of the surgical nurses. Nurses with a bachelor's degree experienced less EE than other nurses. On the other hand, their PA and job satisfaction rates were higher. Some of thestudy has yielded different findings about the bachelor's degree. Similar to the results of our study, other studies have reported that nurses with a bachelor's degree had higher PA scores[35,39]. On the other hand, Arafa, Nazel, Ibrahim and Attia [40] reported that the psychological well-being of the nurses with a bachelor's degree was worse. Other studies conducted in Turkey have suggested that a bachelor's degree did not affect the state of burnout [37,41].

In the current study, we discovered that no variables except a bachelor's degree were correlated with burnout and job satisfaction of the surgical nurses. There were studies that supported this result [41,42]. However, other studies have reported that there was a correlation between burnout, age and working time [34,43,44,45,46]and the selection of the department by the nurse herself [37] and shift-work [4].

Conclusions

The result of this study demonstrated that the state of emotional exhaustion and depersonalization of the surgical nurses was higher than all of the nurses and job satisfaction and personal accom-

plishment were similar. It is clear that the job requirements of nurses would prevent many changes in the physical environment of the hospitals. However, nursing supervisors could play an important role in improving job satisfaction among subordinates. This could be accomplished by maintaining good social relations with staff, and by showing concern for the staff's welfare and health issues.

Other ways to decrease nurses' burnout levels could include organizational interventions, such as decreasing working hours and rotational working between units. In addition, teambuilding, stress management training, relaxation workshops or seminars for nurses, regular meetings with colleagues, and improved social environments are all necessary to decreasenurses' burnout.

Implication for practices and future research

Nurses who work in high-stress departments or units where they must interact with critically-ill patients and their families are at great risk for experiencing high levels of burnout and low job satisfaction. Burnout and lack of job satisfaction negatively affect the nurses physiologically and psychologically which may cause unhappiness at work, decreasedperformance and a tendency to leave this field of work entirely.

The "nurse shortage**"** remains an unsolved problem. The quality of patient care is negatively affected by the loss of available personnel and continuing nurse shortage. Therefore, it is very important to determine the state of burnout and job satisfaction of the nurses and to develop and promote solutions which will protect and improve the health of all caregivers. As far as we know, studies specifically exploring the burnout and job satisfaction levels of surgical nurses are limited.

Therefore, our results will contribute internationally and might now be compared to other studies. This is important because the issues of burnout and job satisfaction levels impact health care personnel worldwide, and directly affect the health of nurses and the quality of care which they deliver to patients.

Limitations

Some limitations are noted in this study. First, all participants were female and if we had had any male participants we could have assessed the correlation between burnout and gender. The result of the study was valid only for the nurses working at this hospital. Our study is limited by the absence of a cut-off value for the Turkish MBI to dichotomize the burnout status (burnout vs. no burnout). It is also known that personal factors play a role in the development of the burnout syndrome, but we did not collect any data on personal characteristics in this study. Also, cases involving the lack of personal success or accomplishment may need to be investigated by qualitative research.

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Changing medical students' knowledge, skills, and attitudes about patient safety

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Abstract

Background: The complexity of modern healthcare increases the risk of adverse events and harms to patients. To prevent errors from occurring, more emphasis should be placed on patient safety education, especially for medical students and trainees.

Study design: An evidenced-based course on patient safety and medical error was designed**.** Medical students in a large teaching hospital in Tehran were asked to complete a knowledge, attitudes and skills questionnaire before and after the course. Pretest and posttest scores were compared using t-paired test.

Results: of the 145 questionnaires, 132 (91%) in pretest and 99 (69%) in posttest were returned. The total knowledge score, 8 items in attitudes section and 3 items in skills section improved significantly following introducing the course. Students were largely satisfied with the course with 72% rated it highly.

Conclusions: Before attending the course, medical students demonstrated little understanding of the patient safety concept and negative attitudes toward it. The course led to positive changes in final year medical students' knowledge, attitudes and skills.

Key words: Medical Student, Education, Knowledge, Attitude, Skill, Patient Safety

Introduction

Following the publication of the Institute of Medicine (IOM) report (To err is human: building a safer health system), which revealed the extent of harm caused by healthcare, patient safety was brought to the top of the policy agenda worldwide [1,2]. Several studies demonstrated that alongside the enormous benefit of medical care, are significant risks to patients [3]. According to WHO, there is little evidence about the burden of unsafe care and medical errors in developing countries [4]. Although there is no published evidence in Iran estimating the extent of adverse events in healthcare settings, there is an increasing trend in the number of patients' legal complaints against healthcare workers, especially physicians, due to malpractice and medical errors [5]. In response to the growing recognition of the importance of patient safety, international governing bodies suggested numerous strategies including change in the education and training of physicians [6]. To minimize medical errors and improve patient safety, the next generation of physicians must be prepared to recognize potential sources of medical errors and learn how to control and mitigate adverse consequences of errors. Effective error management is a core element of safety training for professionals in other hazardous industries such as aviation. However, in medical education little attention has been paid to this important issue. In other words, if healthcare systems are to change the current healthcare culture, it is important that medical students begin to understand and demonstrate appropriate skills related to medical errors [7-9].

Influential organizations put a strong emphasis on the education and training of medical students in order to improve their capabilities in coping with medical errors and engage them fully in the process of quality improvement [10]. The WHO World Alliance for Patient Safety started a program to fill the gap in patient safety education and developed a patient safety curriculum guide for medical students in 2009 [6]. Patient safety education has not been incorporated into curriculum of Iranian medical students yet. However, following the implementation of the national quality improvement program in 2010 (clinical governance) in

health system, the Ministry of Health set an agenda to incorporate materials about patient safety as a main elements in clinical governance into curricula of medicine and dentistry.

Several studies have explored the knowledge and attitudes of undergraduate medical students toward medical errors and patient safety all around the world. Based on the finding of these studies, there are substantial deficiencies in trainees' patient safety knowledge and introducing patient safety curriculum can made significant changes in their knowledge and beliefs regarding this issue [11-15].

To our knowledge, there is no published study in Iran that has evaluated Iranian medical students' knowledge and attitudes toward patient safety. The aim of this study was to develop and evaluate a patient safety course which designed to improve medical students' knowledge and skills and change their attitudes toward patient safety and medical errors. This study was a part of a larger project aimed to design a medical error reporting system in a teaching hospital.

Methodology

The study was conducted in a large teaching hospital, *Rasoul Akram Medical Complex*, affiliated to Tehran University of Medical Sciences from 2009 to 2010. All final- year medical students who rotated in dermatology, pediatrics, ENT, surgery, obstetrics and gynecology, ophthalmology, dermatology, and emergency wards participated in the patient safety course as a component of their educational programs in these wards. This educational course was held in two sessions and each session was presented as a two-hour lecture using power-point slides to attract the attention of participants to key points. Breaks between sessions provided the opportunity for medical students to describe their own experiences regarding medical errors. At the end of the presentation, there was a panel discussion in which the attending physicians shared their knowledge and experiences regarding medical error in their given specialty. The curriculum was primarily taught by 3 lecturers with the assistance of a number of physicians (ward supervisors and other volunteers) in group discussion.

Several references were used in developing of this course. The course content consisted of five main sections: Patient safety and epidemiology of adverse events, medical error definition, human approach vs. system approach, medical error reporting systems, and root cause analysis (RCA).

The first section of the course introduced students to the epidemiology of medical errors, the Institute of Medicine report, its recommendations, burden of medical errors (cost/mortality/morbidity), finding of other incidence studies and main issues of world alliance for patient safety program presented by WHO. Definition of errors, adverse events, sentinel events, slips, lapses, mistakes, active errors and latent failures were presented in the second section. This section was presented in a lecture format and considering the specialty, different examples of errors and adverse events were incorporated into the materials. Considering the need for system thinking, the third section explained systems versus human approach, human fallibility, Reason's model of human error and Swiss Cheese Model of accident causation. The fourth section focused on how reporting systems can lead to improvement and the characteristics of a successful reporting system were explained. The fifth section dealt with the use of investigation tools to identify contributing factors of adverse events. In this part, the root cause analysis method based on the Indhoven model was introduced.

A 24-item questionnaire was developed to assess medical students' knowledge, attitudes and skills before and after the course. The survey instrument was designed based on the Schnall's questionnaire and literature review [15,16]. The questionnaire consisted of four parts. The first section covered demographic information followed by three sections that assessed knowledge, attitudes, and skills respectively. Finally, they were asked to evaluate the quality of the course by rating it through a five- point ordinal scale ranging from very poor to very strong and to offer suggestions for further improvement of the course in the future. Students were asked to complete the questionnaire before the course and two months following the course. The instrument was reviewed by two physicians for face validity. To ensure reliability, it was pilot tested on a sample of medical students (n=15) in another hospital and revised accordingly.

Seven multiple-choice items evaluated the level of students' knowledge about patient safety.

Students attitudes toward patient safety were explored using 10 items in the questionnaire based on a 5- point Likert scale from strongly disagree (1) to strongly agree (5). Patient safety skills were assessed through 3 questions in the questionnaire scored in a 5- point Likert scale from very uncomfortable (1) to very comfortable (5). Results were analyzed using SPSS and related statistical tests.

Findings

Ninety one percent (n=132) students returned the questionnaires immediately before the first learning session (pretest) and 99 (69%) completed and returned the questionnaire two months after the final learning session. None of the students declared that they had passed a course in patient safety or quality improvement in health care, indicating that the course was their first exposure to medical error concepts.

Table 1 presents the percentage of correct answers in the knowledge section in the pretest and posttest phases and the results of t-test paired comparing means (with a 95% confidence interval). The overall means (SD) of knowledge score was 1.6 (0.8) out of 7 in pretest and 4.5 (0.6) in posttest indicating that the mean of the respondents' knowledge improved in the pretest significantly (P<.001). Except one item (item No. 1) the percentage of correct answers improved in this section following introducing the course.

Table 2 shows the change in the students' agreement with statements related to patient safety and medical errors. The pretest means, the posttest means, mean paired differences and the percentage of students who strongly agreed/disagreed with each attitude item in pretest and posttest is presented in this table. Based on the findings, students' attitudes changed significantly in the expected direction on 8 statements.

The first four attitude items addressed the cause of medical errors. Students' responses to items number 1 and 3 addressing inevitability of medical errors in medicine and perception about competence and making errors have been improved significantly after taking the course, while two items-2 and 4 - did not change significantly.

Items 5 to 10 addressed the management of medical errors. Results show that students attitudes toward effectiveness of human versus system responses to errors, the effectiveness of reporting systems, being open about the errors they witness and the necessity of patient safety education for medical students improved significantly following the course. No statistically significant change in item number 5 was reported.

As table 3 shows, 3 skill items also improved after the students participated in the course : disclosing an error to a faculty member, supporting a peer while an adverse event occurs and conducting root cause analysis to detecting main causes of an adverse event.

Table 1. Medical student responses to knowledge items before and after the course

Items	Percentage of correct answers (pretest)	Percentage of correct answers (posttest)	Change % (P- value)
1. Estimating the percentage of hospitalizations with adverse events	18.8%	35.3%	17% (p =0.017)
2. Definitions of medical error	24.8%	54.5%	29% (p<0.001)
3. Defining the characteristic of a reporting system	22.5%	55.5%	33% (p <0.001)
4. Distinguish among errors, near misses and adverse events	10.5%	48.5%	(p<0.001)
5. Defining active errors	14.3%	5% .54	(p <0.001)
6. Defining latent errors	12.8%	61.2%	(p <0.001)
7. Knowing Swiss cheese model	19.5%	59.6%	(p <0.001)
Total score mean (SD)*	(0.8) 1.6	(0.6) 4.5	(p<0.001)

**Out of 7*

Table 2. Medical student responses to knowledge items before and after the course

Items	% who agreed/ strongly agreed in Pretest	Pretest mean response	Posttest mean response	% who agreed/ strongly agreed in posttest	Mean change (p-value)
1. Making errors is inevitable in medicine.	34.6%	2.6	4.4	68.7%	p <0.001
2. There is a gap between what is known as best care and what is being provided to patients.	65.4%	3.8	4.2	78.7%	p =0.55
3. Competent doctors do not make errors resulting in patients harm.	87.2%	4.7	2.6	31.3%	p <0.001
4. Most errors occur because of things that physicians cannot do anything about it.	64.4%	4.3	1.8	28.3%	p <0.001
5. Only physicians can determine the main causes of a medical error.	25.7%	2.3	1.8	20.2%	p =0.28
6. If we punish people when they make errors, they will make fewer errors.	60.6%	3.8	0.9	31.3%	p <0.001
7. Reporting systems have a minor effect on improving safety	58.3%	3.5	1.6	18.2%	p <0.001
8. If I saw a medical error, I would not tell others .	53%	3.1	1.4	25.3%	p-value<0.001
9. If there is no harm to patient, there is no need to report an error.	52.6%	4.5	1.9	30.3%	p-value<0.001
10. Learning how to cope with medical errors is essential in medical education.	26.5%	2.4	4.4	70.7%	p-value<0.001

Table 3. Medical student responses to skill items before and after the course

Items	Pretest mean response	Posttest mean response	Mean change (p-value)
1. Disclosure of an error to a supervisor	1.4	3.5	2.1 p <0.001
2. Supporting and advising a peer how to respond to an error	1.1	3.9	2.8 p <0.001
3. Analyse a case to find root causes	0.8	4.1	3.3 p <0.001

Discussion

The findings of this study demonstrated a positive impact of the patient safety curriculum on the medical students' attitudes, knowledge and skills in a teaching hospital in Tehran.

Numerous studies have assessed the level of medical students' knowledge regarding patient safety. Most of them concluded that medical trainees lacked enough knowledge of patient safety concepts [11-15,17-19]. Given trainees' substantial knowledge deficits in this area, this course led to positive changes in their knowledge about patient safety. This outcome is consistent with the findings of similar studies that highlighted the importance of teaching students about medical error and the impact of the educational interventions on students' knowledge [12-15,17-19]. We believe that this dearth of knowledge is due to lack of exposure to related education. The results justify a need for action in providing ongoing education for Iranian medical students.

In the knowledge section, the most dramatic shift occurred in items related to definition and classification of medical errors. Interestingly, one of the well-received parts of the course was error definition.

This course also made a positive change in trainees' attitudes toward medical errors. Similar studies that have evaluated the impact of education on students attitudes, reported positive change in students attitudes toward patient safety and medical errors [13,15,17,20].

Majority of students (87.2%) in the pretest phase declared that a competent physician does not

make mistake. This indicates that they had a fundamental misperception about the nature of adverse events and human fallibility. Young physicians often receive confusing messages about errors in their training. They are told that competent physician do not make mistakes, while they witness medical errors in all settings with disturbing frequency. In this study we tried to challenge the fallacy that only incompetent doctors make mistakes and help students become aware and tolerant of uncertainty.

Similarly, a high percentage of students (60.6%) agreed that punitive procedures can be a good strategy in preventing errors in pretest. This suggests a lack of appreciation of the significance of systemic factors and management systems as potential causes of medical errors among medical students. Making positive changes regarding such attitude was one of the valuable outcomes of the course.

Open communication and discussion about medical errors and adverse events is difficult in all healthcare settings. It has been argued that the prevailing culture in medicine emphasizes that errors means incompetence and suggests a notion of error-free performance. The existing culture of medicine in Iran also follows the same notion. Most of the students (53 %) in the pretest phase reported that if they saw a medical error, they would not disclose it. Group discussions revealed that undergraduate students preferred to report an error to peer rather than residents or faculty members. These findings may indicate that a blame culture existed within the medical education system.

Most physicians encounter medical errors for the first time as they are student. How they are treated can influence their long attitudes and behaviors regarding medical errors. Understandably, applying formal disciplinary measures may discourage them from disclosure of errors .Hence, punitive consequences can prevent a learning opportunity to arise.

The low percentage of students who agreed with the effectiveness of a reporting system in preventing errors in the pretest phase also may indicate that young physicians do not appreciate the value of reporting system in learning from errors and preventing them. However, openness about errors may be a new concept with no system in place for reporting them.

Positive changes in attitudes toward the importance of reporting no harm and near miss events were another remarkable outcome of this study. During the panel discussions many students declared that they do not report near misses because they do not believe that they are errors. Many students believed that there is no need to report near misses and no-harm events. This reflects a lack of awareness of the learning opportunity inherent in near misses. Other high risk industries like nuclear power plant and aviation have focused on learning from near misses for many years and analyzing them as a routine practice. Near misses and adverse events often have the same root causes; however the former occurs more frequently than the latter.

No changes in some medical students' attitudes indicate that they already believed that a gap exists between best and actual medical care. They also believed physicians can affect the source of errors. Students already supported the notion that it takes more than physicians to determine the causes of a medical error.

Besides improving students' knowledge and attitudes, another positive impact of the curriculum was demonstrated in the students' pre and post-course survey responses which showed significant increases in their confidence related to their abilities of analyzing an adverse event applying RCA technique. The confidence level of the students also increased significantly in their ability in disclosing errors to supervisors (attending physicians and residents) and supporting co-workers when an incident happens after participation in the course. Similar studies show teaching students to use suitable techniques to cope with medical errors is essential in establishing a context for initiating improvement plans [13,15,21-23].

Students were largely satisfied with the curriculum with 72% evaluated the course strong and very strong. Seventy five percent of them recommended that the sessions continue in the future. Most of the students felt that the best aspects of the course were related to panel discussion with attending led to an interactive learning process; however the worst aspect of the course was the intensity of it.

In conclusion, the results of our study indicate that the Iranian medical students do not have a high understanding of patient safety issues. Given trainees' substantial knowledge deficits in safety

topic, the need for the inclusion of such trainings in the formal curriculum of medicine in the Iranian medical schools is indispensible.

Physicians play a crucial role in the process of patient care. It is necessary that they redefine their role in the improvement of safe health care delivery as well. Traditionally, curriculum for medical students in Iran has focused on medical knowledge and technical skills and clinical decision making. However, limited attention has been paid to non-technical competencies such as risk management, team working, communication, and collaboration.

Patient safety should not be considered as another subject in medical curriculum; rather, it must be integrated into all areas of clinical education. Students can be taught practical lessons on patient safety as soon as they enter medical schools or wards. Awareness of the high risk nature of health care is not sufficient. Physicians should incorporate patient safety principles into their practice. As future doctors, medical students should be familiar with how the system of healthcare operates and need to be aware of the multiple factors that influence the quality and safety of healthcare.

There are several limitations to the current study that must be acknowledged. Single institution focus and the before and after design should be considered as two main limitations. Although not unique to this study, there is a need for long-term follow-up of the students to determine if the changes in their knowledge and attitudes sustain. Despite these limitations, our findings suggest that education related to patient safety and medical errors can be successfully implemented in undergraduate medical education.

This study provides evidence that a brief educational intervention in a teaching hospital could increase significantly the awareness of patient safety issues among medical trainees and make positive changes in their attitudes toward the concept of patient safety and improve related skills.

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Comparison of methods used in general anesthesia without muscle relaxants and rocuronium bromide and vecuronium bromide use in cases of pediatric adeno-tonsillectomy

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Abstract

Objectives and aim: In this study a total of 60 patients in paediatric age group scheduled for adeno-tonsillectomy the induction of general anaesthesia, without muscle relaxants intubation, the intubation by applying rocuronium bromide and vecuronium bromide, as well as each of three methods were investigated in terms of the row of operation of each three methods and differences in recovery or superiority to each other.

Materials and methods: 60 patients who were in ASA I-II class between the ages of 5-16 were included in the study. Patients were randomly divided into three groups. Propofol were used with 2.5-3 mg / kg doses and fentanyl were used 1.5 µgr/ kg in the induction of all patients. Group A: was stimu 5% sevoflurane and in 50/50% O_2/N_2O mixture (total: 6lt / min) induction, Group B: 0.6 mg/kg rocuronium bromide I.V, 50/50% O_2/N_2O mixture (total: 6lt / min) induction, Group C: 0.1 mg/kg vecuronium bromide I.V, 50/50% O_2/N_2O mixture (total: 6lt / min) induction was performed; and also in all patients, prior to intubation, 10% topical lidocaine spray was applied around the oro pharyngeal and vocal cord. Sevoflurane 2% concentration and 50/50% O_2/N_2O mixture (total: 6lt / min) were performed during anesthesia maintenance. After the patients were waken up, they were subjected to modified Aldrete scoring system in the recovery room, patients scored 9 and above according to the scoring system were sent to the service.

Results and conclusions: As a result, Group A (the group muscle relaxant not applied to) was concluded to be a good alternative as Modified Aldrete scoring system's adequate score 9 and above have been achieved more quickly when compared to other group to which non-depolarizing muscle relaxant was applied and muscle relaxant free intubation especially in cases of paediatric adeno-tonsillectomy, the early post-operative recovery and dispatch service, in prevention of adverse effects and complications of muscle relaxants dependent on general anesthesia.

Key words: Vecuronium bromide, Rocuronium bromide, Muscle relaxants, Adeno-tonsillectomy

Introduction

Although it has been known for a long time that nondepolarizing muscle relaxants onset times can be shortened by the use of large doses, the use of these doses both extends the duration of clinical effect and increases the likelihood of side effects (1).

Introduction of vecuronium and atracurium in anaesthesia provided a clinical flexibility in application of muscle relaxant due to the shorter onset duration and shorter duration of clinical effect of these drugs than other non-depolarizing drugs (2).

Many studies reveal that a good premedication, in the presence of a suitable anatomy, makes intubation possible without using neuromuscular blocking. (3-4)

In the induction of anaesthesia in short-term operations, succinylcholine, which is a short-acting muscle relaxant with hypnotic, is the most commonly used agent. However, after the use of succinylcholine, side effects such as prolonged paralysis postoperative myalgia, malignant hyperthermia, hyperkalaemia, cardiac arrhythmias, intraocular, intracranial pressure increment can be seen. The short-acting non-depolarizing muscle relaxants

having fewer side effects than succinylcholine also have some undesired adverse effects such as it requires antagonist and tracheal intubation or in the situations where mask ventilation is not possible, the block is not possible to return quickly (5).

The aim of this study is, in the cases of short-term surgery adeno-tonsillectomy,, without using muscle relaxants, to compare topical agents assisted general anaesthesia with agents with which non-depolarizing muscle relaxants are used in terms of postoperative effects and recovery periods.

Material and method

This study is in Phase IV group; before the study, oral and written confirmation of parents of patients confirmation of ethical committee were taken.

60 patients of children between the ages of 5-16, who did not have ASA I-II class of cardiovascular, pulmonary, renal, hepatic, neurologic, psychiatric, neuromuscular, inflammatory or endocrine diseases and did not use medication to affect the neuromuscular junction, were included in our study in order to apply adeno-tonsillectomy. All patients underwent for routine biochemistry tests and complete blood count in pre-operative preparation. Elective surgery patients, whose operation duration was considered to be less than 1 hour and who were considered to not to need muscle relaxant except for endotracheal intubation dose, were included in the study. Premedication was performed with 0.3-0.4 mg / kg midazolam instillated intranasal to patients 30 min before surgery. The patients taken in the operating room, were monitored non-invasively (Philips intellivue mp30 monitor) for controlling the heart rate and arterial pressure and 2-3 mg / kg Iso-P infusion was started by opening vascular access hand dorsally with a 22 G cannula.

Patients were randomly divided into three groups; as

- Muscle relaxants free group (Group A) (n=20),
- Vecuronium bromide group (Group B) (n=20),
- Rocuronium bromide group (Group C) (n=20).

For the induction of anesthesia, propofol 2 mg/kg, and 5% sevoflurane, 50% / 50% (a total of 6 l/min.) gas mixtures of O2 and N2O were used for patients in group A; vecuronium bromide 0.1 mg/kg, propofol 2 mg/kg, 50% / 50% (a total of 6 l/min.) O_2 and N_2O gas mixtures were used for vecuronium bromide group (Group B); 0.6 mg/kg IV propofol, rocuronium bromide 2 mg/kg, 50% / 50% (a total of 6 l / min.) O_2 and N_2O gas mixtures were used for rocuronium bromide group (Group C); and for all three groups in the induction, 1μgr/kg IV fentanyl citrate was applied and the maintenance of general anaesthesia was ensured with 2% sevoflurane and 50% / % 50 N_2O-O_2 mixture of per cent (total 6lt/dk.). In all groups, before intubation following induction, 10% lidocaine spray solution was applied topically around pharynx, epiglottis and vocal cords.

Patients were monitored with Heart Rate (HR), systolic arterial pressure (SAP), diastolic arterial pressure (DAB), Electrocardiogram (ECG) and non-invasive measurement of arterial pressure. These hemodynamic data were recorded in preoperative period, at 30 sec after induction, 1 min after endotracheal intubation, 1 min after surgical incision, 10, 20, 30 and 40 min after the start of surgery, and 1 min after extubation times.

In order to prevent possible re-curarisation just before extubation, all patients with the muscle relaxant administered neostigmine 0.04 mg/kg and 0.02 mg/kg atropine. Patients were evaluated with "Modified Aldrete Scoring System" at 10 minutes after extubation (Table 1.)

Statistical evaluation of the obtained data was performed by using "Kruskal-Wallis' analysis of variance, the" Mann-Whitney U test ", and "Wilcoxon" paired two-sample test. In statistical calculations, $p < 0.05$ was considered as significant result.

Results

There was no significant difference between the patients of the groups of muscle relaxants free, vecuronium and rocuronium in terms of age, weight and operation time.

Difference between groups in terms of intubation quality was not significant. Acceptable (excellent + good) intubation conditions were achieved in all three groups (Muscle relaxants free 80,2%, rocuronium 80,4% , vecuronyum 78,9%).

HR at 1 min after intubation in patients, who were not applied muscle relaxant, was statistically significantly higher than HR in the preoperative period ($p<0.05$).

Table 1. Modified Aldrete Score System (scoring system used to determine whether patients are ready during they are consigned from recovery room to service)

Activity, able to move, voluntarily or on command	Four extremities Two extremities No extremities	2 1 0
Respiration	Able to breathe deeply and cough freely Dyspnoea, shallow or limited breathing Apnoea	2 1 0
Circulation	Blood pressure with 20mm Hg of preoperative level Blood pressure within 20-50 mmHG of preoperative level Blood pressure ±50mmHg of preoperative level	2 1 0
Consciousness	Fully awake Arousable on calling Unresponsive	2 1 0
Oxygen saturation	Saturation >92% Needs oxygen to maintain saturation >90% Saturation <90% with oxygen	2 1 0

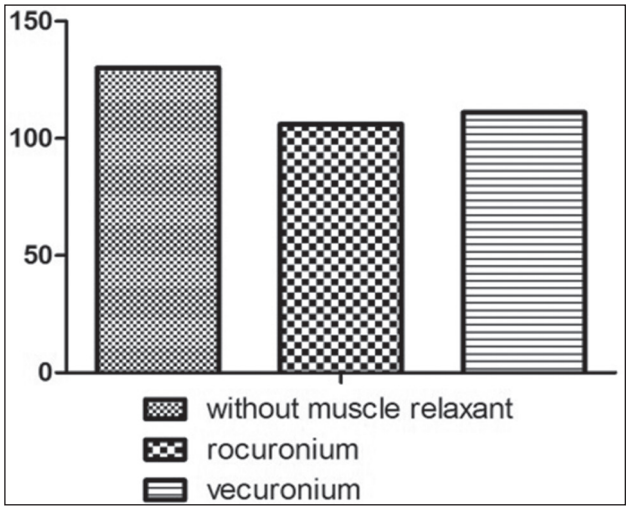

Figure 1. HR at 1 min after intubation in Group A

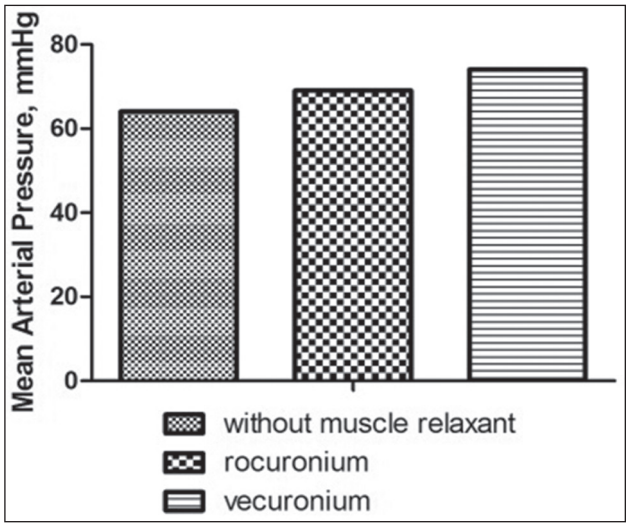

Figure 2. MAP at 20 min after surgery started in Group A

In addition, in patients without muscle relaxants mean arterial pressure (MAP), at 20 and 40 min after surgery started, have been found to be significantly lower than preoperative values ($p<0.05$)

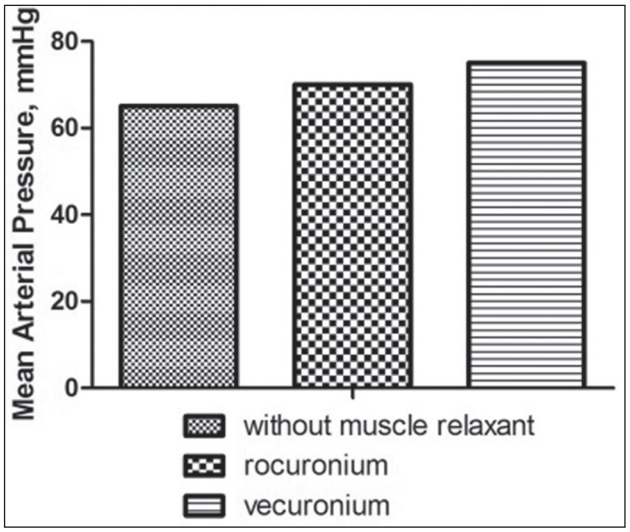

Figure 3. MAP at 40 min after surgery started in Group A

In vecuronium group, MAP at 30 min after surgery started, was significantly lower than MAP at preoperative period ($p <0.05$).

In the group of patients to whom rocuronium was administered, MAP at 10, 20, 30 and 40 min after surgery started were found to be significantly lower ($p<0.05$). All these changes determined with hemodynamic data returned to preoperative values after extubation.

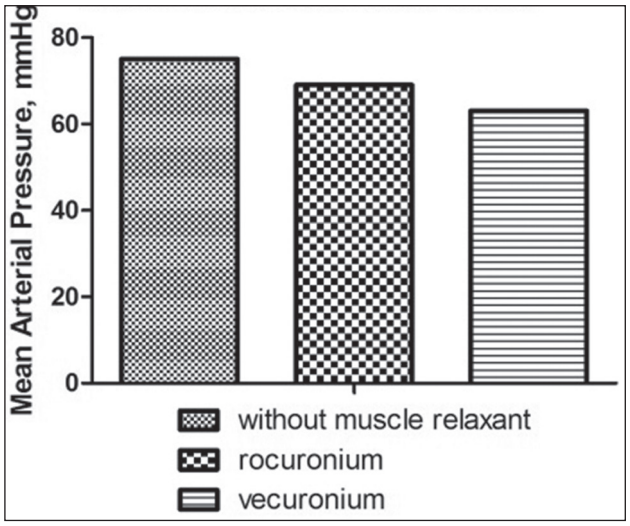

Figure 4. MAP at 30 min after surgery started in Group B

During the recovery period, late attainment of Modified Aldrete scoring (MAS) of 9 and above was significant for rocuronium group when compared with the other two groups ($p < 0.05$). No significant difference between muscle relaxants free and vecuronium groups was detected.

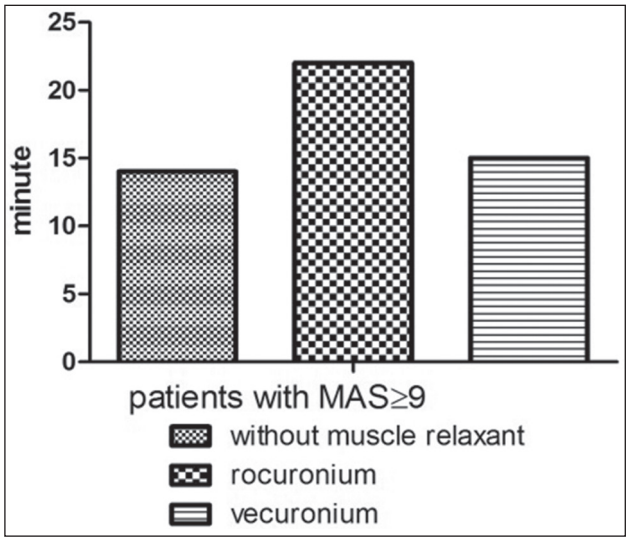

Figure 5. During the recovery period Modified Aldrete Scores of Groups

Discussion

One of the important developments in anaesthesia is studies trying to find a muscle relaxant with ideal characteristics. Of these features, muscle relaxant to be fast and short-acting has a great importance for both patient and anaesthesiologist in terms of reliability of anaesthetic administration. (6)

Tracheal intubation is usually performed through a muscle relaxant administered after induction of anaesthesia. During intubation anaesthetic depth must prevent reflex activity and muscle relaxation must be complete (9). In cases when the use of muscle relaxant agent is undesirable, such as short-term operation, motor neuron disease, drug allergy (10), the use of hypnotics and opioids at a dose of the anaesthetic induction could provide adequate conditions for tracheal intubation without muscle-relaxing agent (11).

Rocuronium, a non-depolarizing muscle relaxant has been used effectively because of especially its short duration of onset and its medium-term duration of clinical effect. At high doses its duration of onset has been reported to be similar to succinylcholine-choline. (6)

In a comparative study performed with equivalent doses of vecuronium and rocuronium, with rocuronium, a 7% increase was found to be in HR (statistically not significant), a 11 % increase was found to be in cardiac index (statistically significant, clinically insignificant) (7)

In a study conducted in children, Fuchs-Buder et al. reported that use of rocuronium had a minimal effect on HR and MAP and provided cardiovascular stability. (8)

In our study, propofol, opioids, and topical anaesthetic agents were used together, appropriate conditions in terms of response to laryngoscopy and intubation were provided. The recommended high-dose opioids in practice cause respiratory depression and thoracic rigidity. Rigidity of the thorax could cause difficulty of ventilation in intubation needs to be done, especially without the use of neuromuscular blockers. Although, its fentanyl doses more than 55-75 was µgr / kg are associated with clinically significant muscular rigidity (12); muscular rigidity has been observed in none of the patients in fentanyl and propofol groups in our study. Mirakhur et al. stated that rocuronium did not cause hypotension, hypertension, and tachycardia if not applied in very high doses. (13)

Conclusion

Hemodynamic data obtained from this study, are compatible with unspecified cardiovascular system and autonomic features of rocuronium. All

of these hemodynamic changes returned to preoperative values after extubation and have not been evaluated as clinically important.

In particular, we believe that in patients with the cardiac risk, fentanyl use in the induction could be preferred because it can deliver a better hemodynamic stability when compared to opioids such as alfentanil or remifentanil.

Recovery from anaesthesia occurs with withdrawal effects of used anaesthetic drugs and anaesthesia techniques. Based on this sentence, we concluded that intubation without muscle relaxants, especially in the cases thought to have a short duration, can increase the postoperative patient safety it terms of not requiring re-curarisation and by providing early recovery.

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C-reactive protein levels in chronic gingivitis, chronic periodontitis and periodontally healthy subjects

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Abstract

Background and aim: It has been shown that there is a relationship between periodontal diseases and cardiovascular events. C-reactive protein (CRP) is one of the acute phase reactant which increases in periodontitis and also is known as a potential risk factor in cardiovascular diseases. This study designed to compare the CRP level in chronic gingivitis, chronic periodontitis and periodontally healthy population.

Materials and methods: In this cross-sectional study, 50 persons aged 22-53 years were enrolled from those who were visited in periodontix ward of Isfahan Azad University of dentistry, 2008-2009. Twenty five were diagnosed as chronic periodontitis, 20 were chronic gingivitis and five were periodontally healthy. Inclusion criteria were as followings: no systemic disease, non-smokers, not on oral contraceptive pills or other medicine affecting on CRP level, not pregnant, having at least 20 teeth and at least 5 bleeding areas during probing in cases with gingivitis. Periodontal examination included probing depth and attachment loss measurements, gingival recession and Leo and Sillness gingival index. Blood samples were collected from all subjects. CRP was measured using agglutination method (Spinreact kit, Spain) and results were showed as a range of negative to 3 plus. Data were analyzed using Kruskal-Wilis and t-test.

Results: There was no significant difference between three groups but mean gingival index, probing depth and attachment loss were significantly higher in CRP positive compared to the negative ones. CRP increased while increasing severity and extent of periodontal disease.

Conclusion: CRP should be kept in mind when there is a periodontal disease, although no significant differences were seen. Further quantitative study on CRP levels could be suggested.

Key words: CRP, chronic gingivitis, chronic periodontitis

Introduction

C-reactive protein (CRP)

C-reactive protein (CRP) is one of the nonspecific acute-phase response markers to inflammation, infection, and tissue damage which could not provide clinically useful information, alone. So its value could only be meaningful at the bedside where all clinical and pathological results are available. Compared to other acute-phase reactants, such as erythrocyte sedimentation rate (ESR), the circulating value of CRP reflects ongoing inflammation and/or tissue damage much more accurately although it is not applicable in all diseases. The median concentration of CRP is 0.8 mg/l in healthy young adult volunteer blood donors, but after an acute-phase stimulus, it may increase from less than 50 μg/l to more than 500mg/l, i.e. 10,000-fold.

CRP and Cardiovascular diseases (CVD)

There are growing number of literatures emphasize the role of infection and inflammation in the pathogenesis of atherosclerosis. Cardiovascular disease is the main cause of morbidity and mortality in developed countries (1). A prognostic

role was suggested for increased CRP production in the outcome of acute myocardial infarction and acute coronary syndromes in earlier studies (2-8).

Oral health and atherosclerosis

The first suggestion about the possible relationship between the oral health and atherosclerosis was published in an article in 1988. It had been shown that the risk indicators of cardiovascular diseases are increased in those with periodontitis or poor oral health(1). Growing evidences show that poor oral health, especially periodontitis, increases the risk of acute myocardial infarction. On the other hand, there are a series of shared features between periodontitis and cardiovascular diseases, such as a higher incidence in adult males, smokers, diabetics, and individuals with stress and/or a low socioeconomic level (9).

There are different hypothesis regards to this relationship; the most widely established hypothesis says that the relationship between acute myocardial infarction and periodontitis depends on common risk factors; in this point of view tobacco use is the main confounding factor. "Direct action of periodontal pathogens that produce endotoxins and the release of proinflammatory mediators by the host monocytes" is the basis of other hypotheses, "causing local and systemic destruction of the connective tissue and favoring platelet aggregation and thromboembolic events" (9).

Cueto et al conducted a case-control study in Spain, consisted of 72 cases (acute myocardial infarction) and 77 controls (trauma patients). Their results showed that periodontal variables (gingival retraction, pocket depth, and periodontitis) were worse in cases compared to controls (9). Scannapieco et al, included all randomized clinical trials, cohort and case-control studies on periodontal and cardiovascular diseases, published in data banks like MEDLINE and Cochrane in a systematic review (2003) and concluded that periodontal disease may be modestly associated with atherosclerosis, myocardial infarction and CVD (1).However, there are some controversies and some resulted in no relationships (10).

This study designed to compare the CRP level in chronic gingivitis, chronic periodontitis and periodontally healthy population.

Materials and methods

In this cross-sectional study, 45 patients with chronic periodontitis (25) and chronic gingivitis (20) and 5 healthy person who were visited in Periodontix department in Isfahan dentistry clinic, Azad Islamic University of Isfahan, 2008-2009 were enrolled. Inclusion criteria were as followings: no systemic disease, non-smokers, no use of oral contraceptives or medicines with an effect on CRP or periodontal situation, not pregnant, at least 20 teeth in the mouse, no loss of periodontal attachment and at least 5 bleeding area during probing in those with gingivitis. Patients with periodontal diseases were examined probing for the depth of probing (pocket depth examined with a parallel probe to the vertical axis of the tooth), clinical attachment (the distance between the basis of pocket and Cemento Enamel Junction (CEJ)), gingival retraction (measured by a periodontal probe from CEJ to the gingival crest), and Leo and Sillness gingival index. Gingival index is used to evaluate the inflammation of gingival tissues. In this method, 4 surfaces of teeth (Buccal, Lingual, Mesial and Distal) examined and scored from zero to 3. Bleeding was measured moving the periodontal probe along the gingival soft tissue wall. All scores are computed and divided to 4 to show each teeth score. Gingival index of each patient achieved adding each teeth score and dividing the sum to the number of tooth. Loe and Silness gingival index degrees are as followings: 0=normal gingiva, 1= mild inflam, slight color change and edema, no bleeding, 2= moderate inflam, redness, edema, bleeds on probing, 3= severe inflam, marked redness and edema, ulceration, spontaneous bleeding.

Measuring CRP was done using the CRP kit (Spinreact, Spain) and was reported as below:

- 3+: giant agglutination
- 2+: moderate agglutination
- 1+: tiny agglutination
- Negative: no agglutination

Data were coded and entered into SPSS-16 software; analysis was done using Kruskal-Wallis and t-test.

Results

Patients enrolled in this study had an age range of 22-53 years. As showed in table 1, there was no significant difference between the three groups regards to CRP severity, although patients with periodontitis had more than 3-fold positive cases of CRP compared to gingivitis.

Table 1. Severity of CRP in patients with periodontitis, gingivitis and normal dental health

CRP score	Periodontitis		Gingivitis		Normal	
	n	%	n	%	n	%
–	21	84	19	95	5	100
+	2	8	0	0	0	0
++	2	8	1	5	0	0
Total	25	100	20	100	5	100
p-value	0.13					

There were a significant differences between patients with positive and negative CRP regards to the gingival index, probing depth and detachment. Table 2.

Table 2. Comparison of clinical periodontal parameters between CRP-positive and -negative cases.

Variable	Negative		Positive		p-value
	Mean	SD	Mean	SD	
Gingival index	1.7	0.64	2.7	0.63	0.002
Probing depth	2.22	0.78	4.21	0.9	<0.001
Detachment	11.3	0.99	5.3	0.96	<0.001
Gingival retraction	0.9	0.99	1.1	0.16	0.474

As shown in Table 3, the rate of positive CRP increased with the increase in periodontitis severity.

Table 3. CRP scoring relating to severity of periodontitis

CRP score	Severe		Moderate		Mild	
	n	%	n	%	n	%
Negative	2	40	11	91.5	8	100
Positive	3	60	1	8.5	0	0
Total	5	100	12	100	8	100

CRP was positive in more cases with widespread gingivitis than the marginal one. Also it was more positive in widespread periodontitis compared to the local ones.

Table 4. CRP scoring for widespread and marginal gingivitis.

CRP score	Widespread		Marginal	
	n	%	n	%
Negative	6	85.5	13	100
Positive	1	14.5	0	0
Total	7	100	13	100

Discussion

Due to the asymptomatic behaviors of periodontitis, even severe periodontal disease, which occurs in approximately 14% of the US adult population, could be hidden for years before an appropriate periodontal exam with a probe or intra-oral radiographs (11).

In this study, we did not find a relationship between CRP results and periodontitis or gingivitis. But significant differences were reported between patients with positive and negative CRP regards to the gingival index, probing depth and detachment. Most of the other studies reported a significant relationship.

Slade et al conducted a study on a random sample of the US population; CRP was quantified from peripheral blood samples. Periodontal examinations showed a one-third increase in mean CRP and a doubling in prevalence of elevated CRP in dentate people with extensive periodontal disease (> 10% of sites with periodontal pockets 4+ mm) compared with periodontally healthy people. On the other hand, CRP levels were similarly raised in edentulous people. Periodontal disease and edentulism were associated with systemic inflammatory response in this study (11).

Noak et al (2001, USA) assessed CRP serum level in 174 subjects with moderateto high mean clinical attachment loss and compared them to 65 periodontally healthy controls, which showed a statistically significant increases in CRP levels in cases compared to healthy controls (12).

Pitiphat et al (2008, Thailand) measured serum high-sensitivity CRP in 21 generalized periodontitis, 62 localized periodontitis, and 38 periodontally healthy control subjects.

Subjects with generalized periodontitis and localized periodontitis had higher median CRP levels than controls (13).

Sun et al in a case-control study (China, 2008) collected plasma samples from 84 patients with aggressive periodontitis and 65 controls. The levels of plasma C-reactive protein in patients with aggressive periodontitis were significantly higher than those in controls (14).

Quantitative measurement of CRP level is one of the most notable points in the majority of these studies and maybe one of our limitations in discussing our results.

In the present study, we found that increasing the severity of periodontal disease from gingivitis to periodontitis, there was more CRP positive cases and also there were more CRP positive cases with increase in the severity of periodontitis. Maybe further investigations with higher sample size could be more suggestive regards to the relationship between CRP and oral health.

As the association between oral health, inflammatory response and life-threatening conditions like cardiovascular disease was mentioned in other literatures (1, 9, 15), it could be concluded that after adjusting other known risk factors of CVD, cases with periodontal diseases should be considered as at risk population.

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Nursing students' perceptions of caring in Turkey

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Abstract

Purpose: To determine perception of caring and its contributing factors in nursing students.

Method: The study was descriptive-correlation type. Students from a 4-year undergraduate nursing program in a university in Turkey were included in this study. The second-year through fourth-year student volunteers were interviewed to explore caring behavior in nursing students. This study was carried out through 233 students. The demographic data questionnaire and Caring Behaviors Inventory-24 were completed by students themselves in the classroom.

Results: While total score in perception of students of caring, who were satisfied with nursing department, who found nursing appropriate profession for themselves, and who described caring in nursing as one of the major areas was higher, mean total score of students who had difficulty in providing care and that of second-year students was lower.

Conclusions: It is determined that perception of caring is affected by the characteristics of the students.

Key words: Nurse education, nursing students, perceptions**,** caring

Introduction

The main purpose of nursing is to help healthy and unhealthy individuals. Nurses provide health care that is fundamentally focused on human needs. Caring has been considered as the central focus of nursing practice. It has been related to patient outcomes (1,2,3) and patient satisfaction (4). The most important responsibility of nurses is to provide high quality care. As nursing students are potential nurses of the future, it is important to let them gain proper caring behaviors during nursing education. Caring outcomes in practice depend on teaching and learning processes. Thus, nurses' views of caring are largely affected by their education. Although caring is a central concept in nursing education, the most important problem is not evaluated from the point of student's perception of caring. Literature over nursing students' perception of caring is limited. This study aims the perceptions of caring among Turkish nursing students.

Caring has been established as the central focus or the core of nursing in research and related literatures (5, 6, 7, 8, 9). It is identified as the "essence" and "crux" of nursing by nursing theorists (5, 6, 9, 10).

The main concepts of nursing theories are such as Leininger's theory of culture care, Watson's theory of human caring, Roach's theory on caring, and Boykine and Schoenhofer's theory on nursing as caring (11). Watson (1979) defined caring as a process involving knowledge, action and consequences and described ten 'carative' factors which can be used to incorporate caring into practice in any clinical setting. Watson (1985) describes caring as a moral ideal of nursing. According to Watson, caring preserves human dignity in cure dominated health care systems and becomes a standard by which cure is measured (5, 6, 7, 12). Leininger defined caring as actions and activities directed towards assisting, supporting or facilitating another individual or group with evident or anticipated needs to ameliorate or improve a human condition or way of life. She believes that caring is a universal concept, but expressions, processes, and patterns are different among all cultures (5, 7, 8, 9).

The concept of caring has gained particular significance during the last 20 years. There is an increasing nursing literature on caring. Many studies using quantitative and qualitative methodologies have been conducted to explore the nature and the meaning of caring. Caring studies include such topics as: patients' perceptions of caring (13, 14, 15, 16, 17), nurses' perceptions of caring (18, 19, 20, 21), comparison of patients' and nurses' perceptions of caring (22, 23, 24, 25, 26, 27, 28, 29) and developing scales over caring (30, 31, 32).

Although caring studies are a lot in literature, studies related to nursing students are limited (33, 34). Chipman (1991) carried out a qualitative study

to help clarify the meaning and value of caring in nursing practices as perceived by second-year nursing students (n=26). It was found that nursing students perceived caring as; giving of self; meeting patients' needs in a timely fashion; providing comfort measures for patients and their families (35). First year nursing students, in a study in Norway, used the word 'care' as they knew about it from daily life. Third year students considered nursing as a caring science which contains knowledge for practicing professional nursing (36). Turkish students in a qualitative study perceived caring predominantly as a professional relationship helping patients and their families. Moreover, many of the students considered caring as having technological knowledge. In the study, basic themes were respect, concern, compassion, communication and comfort (34).

The aim of this study is to determine nursing students' perception of caring and its affecting factors.

Methods

Design

Type of this study is descriptive-correlational. The study was performed with students in nursing departments of a university in Turkey in May 2011.

Participants

The study subjects were derived from nursing students who were undertaking a four-year undergraduate program for a professional degree in nursing in Turkey. The participants were 290 nursing students (98 second-year students; 106 third-year students; and 86 fourth-year students) from the university. The sample included 82 second-year students; 73 third-year students; and 67 fourth-year students. First-year students were excluded from the study due to their being lack of clinical experience. 233 students (80%) responded all the questions in the study.

Procedures

All study activities were approved by the University Health Institutional Review Board. Ethical approval was received from the director of faculty. The students were given a full explanation of the purpose of the study by the investigators. Verbal informed consent was obtained in a face-to-face interview from all participants before initiation of the study. Then, the questionnaire was completed by the students themselves in the classroom. They were also informed that the data obtained from them would be kept confidential.

Instruments

Two tools were used for data collection in this study:

1) The demographic data questionnaire obtained information about the participants' socio-demographic characteristics (age, gender, class) and other factors (whether they choose the profession willingly, whether they are satisfied with the education, whether the profession is considered appropriate for themselves, whether they have personal difficulty in providing caring, and if so, what their reasons are)
2) Caring Behaviors Inventory-24 (CBI-24): The CBI configured by Wu et al. (2006) is a 24-item, four-factor scale that measures the perception of caring on a 6-point Likert-type scale, ranging from 1 = never to 6 = always (37). These four-factors were named as follows: assurance, knowledge and skill, respectful, and connectedness. The original English version of the CBI was developed by Wolf (1986) and Wolf et al. (1994) (32,38). The scale was designed to evaluate the nursing care (32). Higher scores reflect a higher degree of perception of caring. In this study, Cronbach alpha for internal consistency in the total scales was 0.96, indicating good levels of internal consistency.

Statistical analysis

Data from the questionnaire are coded and analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics are used to assess the distribution of socio-demographic characteristics of the participants. t-test and F test are used for analysis of the study. The significance are evaluated at the $p < 0.05$ level.

Results

Sample Characteristics

The response rate was 80%. Of the 233 participants who completed the questionnaire, 79% were female, and 21% were male. The mean age of

sample was 21.36±1.33 years. Of the students in undergraduate program, 37.8% were in the second year, 32.6% in the third and 29.6% in the fourth year of their education (Table 1).

Table 1. Sample Characteristics (n=233)

Characteristics	Mean ±SD	
Age	21.36±1.33	
	n	**%**
Gender		
Female	184	79.0
Male	49	21.0
Class		
Second-year	88	37.8
Third-year	76	32.6
Fourth-year	69	29.6

Students' views about the nursing profession

Half of the students stated that they have not willingly chosen the profession of nursing (54.5%). It was determined that students 31,8% were satisfied from the nursing department and the profession were appropriate for 40.3% of the students. Most of them described the profession as the major area of caring (84.5%). 16.8 % of the students reported they had difficulty in providing care. Lacking theoretical and practical knowledge (29.6%) and being afraid to be mistaken in practice (27.9%) were major reasons for the difficulty in providing care. 62.7% of students said they had difficulty in providing care for the infant/child patients (Table 2).

Nursing Students' Perception of Caring and its Contributing Factors

Mean scores were assurance domain 5.06 (SD=0.71), knowledge and skill domain 5.07 (SD=0.72), respectful domain 5.11 (SD=0.67), connectedness domain 4.94 (SD=0.73) and total scales 5.05 (SD=0.65).

No significant changes were observed in the mean scores according to students' gender and whether they choose the profession willingly or not ($p>0.05$). Significant difference was observed between total scale score and their class ($p<0.05$). The difference is between second-year and fourth-year class students, and the total means score of fourth year students was higher. While mean total score of students who are satisfied with their department, who found the profession appropriate for themselves, and who regarded the profession as one of the major areas in caring was higher, mean total score of students who had difficulty in providing care was lower ($p<0.05$, Table 3).

Table 2. Students' views about the nursing profession (n=233)

Students' views	Yes		No	
	n	**%**	**n**	**%**
Have you willingly chosen the profession of nursing?	106	45.5	127	54.5
Are you satisfied with nursing department at the moment?	74	31.8	159	68.2
Is nursing an appropriate profession for you?	94	40.3	139	59.7
Is nursing the major area of caring?	197	84.5	36	15.5
Have you had difficulty in providing care?	39	16.7	194	83.3
What is your reason for the difficulty in providing care? *				
Lack of theoretical and practical knowledge	69	29.6	164	70.4
Afraid to be mistaken in practice	65	27.9	168	72.1
Lack of role models in clinics	56	24.0	177	76.0
Have difficulty in communicating with patient	21	9.0	212	91.0
Which patient groups do you have difficulty in providing care for? *				
Infant/child patient	146	62.7	87	37.3
Intensive care patient	106	45.5	127	54.5
Patient in terminal period	96	41.2	137	58.8
Acute trauma patient	46	19.7	187	80.3

** Multiple answers were given to these questions*

Table 3. Comparison of the mean scores of the CBI-24 with characteristic of students

Characteristic	Mean ±SD	Statistic value	p
Gender			
Female	5,077±0,563	t=0.965	0.335
Male	4,975±0,929		
Class*			
Second-year[a]	4,907±0,795	F=4.622	0.011
Third-year	5,076±0,432		
Fourth-year[b]	5,221±0,628		
You have willingly chosen the profession of nursing?			
Yes	5,092±0,512	t=0.782	0.435
No	5,024±0,755		
Are you satisfied nursing department at the moment?			
Yes	5,233±0,487	t=2.862	0.005
No	4,973±0,707		
Is an appropriate profession for you to nursing?			
Yes	5,220±0,483	t=3,213	0,001
No	4,944±0,731		
Is the priority area of care in nursing?			
Yes	5,144±0,527	t=3.362	0.002
No	4,568±1,003		
Did you experience difficulty in providing care?			
Yes	4,722±0,808	t=-3.565	0.000
No	5,122±0,601		

**a<b*

Discussion

In this study, 233 nursing students' perception of caring was investigated. This study showed that scores of CBI items that describe the caring behaviors of nurses were high among the nursing students, but the scores of caring behaviors varied according the students' characteristics.

Half of the students continuing the nursing program are involuntary, which is similar to that reported by some studies (39,40,41,42). In this study, although the students did not choose the profession willingly, they have continued their education. This situation showed that the students did not choose the profession knowingly. In Turkey, nursing profession previously was not popular among students accepted to universities. However, in recent years nursing profession has been very much preferred because it is easy to find work after graduation from the department. Majority of the students considered the profession inappropriate for themselves and most of them felt unsatisfied with the nursing department, which is similar to that reported by Wang et al. (2011) (42). On the other hand, it is determined that the majority of students described the profession as the major area of caring and this result is similar to those in the study about nursing students (41). The nursing profession provides care that is focused fundamental human needs. Therefore, caring is the central focus of nursing practices. Nursing is based in the ethic of caring, which means caring establishes the foundation for the nursing profession. During nursing education, the awareness of profession is gained, and this continues throughout professional life.

A minority of the students had difficulty in providing care. Among the reasons are that they lack the theoretical and practical knowledge, are afraid to be mistaken, lack of role models in clinics, and have difficulty communicating with patients. In addition, it was obtained that majority of the students had difficulty in providing care for infant/child patients. These showed that students had trouble in clinical practices. Under the light of these accounts, nursing education curriculum should be reviewed and it should be renewed as regards deficiencies of clinical practices.

Total score of students who were not satisfied with the department, who found the profession inappropriate for themselves, who did not regard the profession as one of the major areas in caring, and had difficulty in providing care was lower than that of other students. These results suggest that the students did not comprehend and internalize nature of nursing profession. In this context, it is important to direct students to choose an appropriate profession in university education and for the ones in nursing departments, it is critical to let them gain the knowledge about nature of the profession (caring, human, holism, ethic etc.). Consequently, internalizing of this knowledge by the students contributes to the quality in patient care.

It is determined that the total scale score of fourth year students was higher than that of second-year students. A study which used CBI showed that fourth-year nursing students perception of caring was higher than that of first-year students (43). Another study stated that older nursing students perceive caring in more professional and technical terms than younger ones (31). In contrast to these findings, Murphy et al. (2009) found that third-year nursing students achieved lower scores than first-year students (44). Education is a process of developing desired behavioral change in nursing students. The students gain the knowledge, skills, attitudes, beliefs, norms, values and ethical standards of nursing during this process. Here, what is desired is that students internalize the profession (45). Clinical work experience is an important part of educational process for nursing students where they modify their caring behaviors in this process. In this study, it is determined that last year students' perception of caring is high due to the knowledge and clinical experiences.

Conclusions

The results of this study showed that perception of caring is affected by some factors such as which class they are in, whether they are satisfied with the department, whether it is the appropriate profession for themselves, whether it is the major area of caring , and whether they had difficulty in providing care. Because it plays an important role in affecting the perceptions of the students related to nursing profession, nursing education curriculum should be reviewed and must be rearranged.

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Ongoing diagnostics mapped: from an individual to the community health index

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Abstract

In this paper we present a concept and potential benefits of the symbiosis between a long-term personalized health monitoring system and the web based geographic information systems. Big data collected during employment of a long-term personalized health monitoring systems enables the prediction of individuals' health trends. The personalized health monitoring systems integrated into web mapping can visually track the public health changes in real-time, reduce informational noise present in current similar systems, and enable highly flexible geographic cluster boundaries with fine zoom resolution equal to a single residential unit.

Key words: Web Mapping, GIS, Health Index, Prediction, Public Health.

Introduction

Evolving of medical devices has been the result of interdisciplinary collaborations. In the era of technological expansion we are witnessing joint medical research with slightly unexpected collaborators from gaming industry to interactive digital cartography.

Recently, there have been expansions of medical-cartography initiatives, popularly named "health maps", which mark geographic locations of outbreaks and emerging diseases. The applications alow to better visualize and understand the health status of a community, and a direction of a disease spreading. The site HealthMap [1] presents real-time information useful for public health officials and international travelers gathered from various internet sources: news sites, eyewitness reports such as blogs, government data, social sites, and search enginees for possible emerging outbreaks, very often delivering information before the oficial announcement.

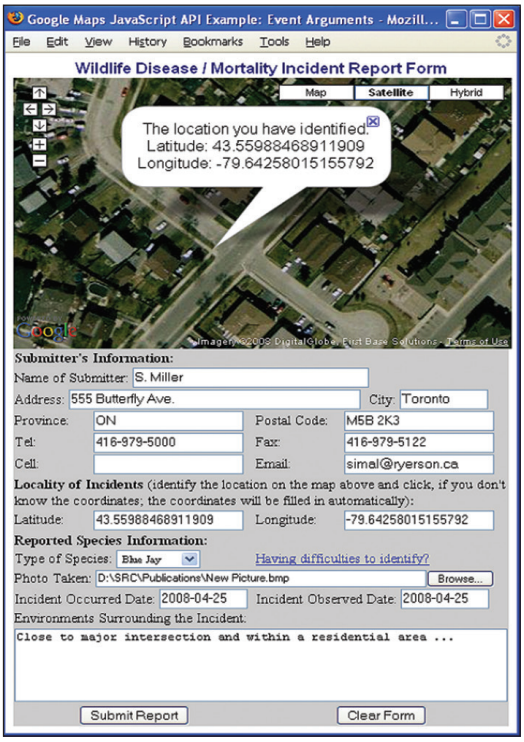

Figure 1. The wildlife disease/mortality form

The Google Maps Mashup application collects data of seasonal outbreaks, such as colds and influenzas. Data is input by users of the site. Although information may not be very objective, it gives to users a possibility to take precaution measures and possibly avoid a disease that circulates in the region [2]. During virus outbreak among birds in mostly rural county West Nile, Canada in 2007, data base of known local bird species from Flickr servers was integrated through Flicker APPs to the Google Maps of the area. The integrated application enabled local citizens to mark a position [3] and choose a picture of a bird species from data base collection for each diseased bird found (see Figure 1). The application accelerated the virus research process, shortened the presence of the disease due to better reaction time of local authorities, and facilitated monitoring of high-risk areas.

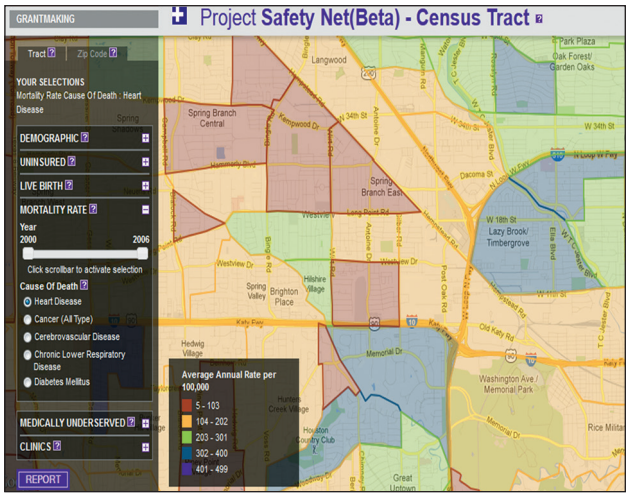

Figure 2. The Houston area Health Portal. Simultaneous employment of filters from different filter clusters, such as for example demographic, time range, disease, or insurance, enables map display of different cross-sections of data. Filter manipulation is part of user interface [6].

Seasonal chronic diseases, such as for example different types of allergies, are not mapped per se. Rather, it is given a seasonal map of plants that cause allergies [4]. Current focus of the health maps is on acute diseases and on incidents of chronic diseases per regions [5,6] (Figure 2). Such applications do not utilize all aspects of interactive capacities of the web based Geographic Information Systems (WBGIS). Also, statistic distributions are based on the averaged population values collected separately from the system, i.e. data collection is not integrated part of the WBGIS.

There are no health maps which track real-time distributions of chronic illnesses, such as but not limited to cardiac or pulmonary diseases, and its progression due to seasonal, habits, or treatment changes. In addition, there are no maps of a region's public health based on continuous collection of real-time objective data of healthy and chronically and acutely ill subjects [7].

Finally, there are no models that would predict future health trends from community's "personalized" information. In this paper we discuss that we reached the technology level that can support such system and the potential benefits of such mapping.

Integrated Health Monitoring and Health Index

The technology advances have enabled a new generation medical devices, which enter a domain of consumer electronics. From the wellness built in ECG units to physical activity monitors, the devices feature small size, lightweight, ease of operation, affordability, and are unobtrusive for most of every day activities. The trend has not bypassed the robust units that used to be reserved for hospital or ambulatory settings, such as an ultrasound device or an x-ray machine, which dramatically shrunk in size, weight, and price. Long-term monitoring during everyday activities has become a reality, employing personalized rather than demographic statistics to collected data. Such monitoring has benefits for both, healthy and non-healthy subjects in disease prevention, early diagnostics, and a follow up of the progress of the medical treatment.

The basic monitoring system has three levels: a) input level; b) data processing level, which may include signal processing, feature extraction, data mining, and personalized prediction models and c) output level (see Figure 3).

Inputs are user entered data, such as logs of everyday activities, exercise, feelings, or a medication management log and objective data captured via sensors and recording hardware, such as but not limited to ECG, voice, motion, or weight. It is desirable for sensors to be non-intrusive, and if possible, that the additional signal processing techniques substitute information that would be acquired from invasive sensors. However, when the benefits supersede the risks, data can be collected from subcutaneous sensors, for example under-skin sensors, which track the glucose levels.

The second level has a two-stage signal processing. The first stage uses automated signal processing techniques to refine raw signals and prepare them for further analysis, examples of which are a noise filtering and detection and removal of corrupted data, or extraction of multimodal features from a single physiologic signal [8]. The second stage includes pattern recognition, the patterns check for consistency or anomalies, short-term predictions for daily planning, or trends recognition for longer-term predictions [9],

correlations with subjective inputs from users, and monitoring of changes in personal health index.

Finally, the output provides information to the user, which can vary from their health status, possible health developments, to warnings and recommended actions or additional input acquirements.

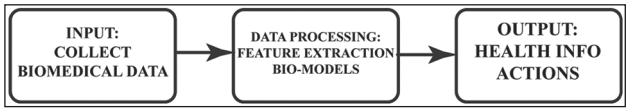

Figure 3. Anatomy of a simple health monitoring system

The big data collection per person enables personalized models, i.e. models that are based on the bio statistics of the user. Prediction of possible health trends has multidimensional impact to the quality of life for both a chronic patient and a healthy user: adds confidence of early reaction, shows direction of health progress, and temporal health changes. In Figure 4 is shown a plot of a user interface of an integrated health system. Health index is a simple measure of a general health and reflects overall health status of the user in a single number. The anatomy of a health index depends on a number of sensors because it is calculated from input values that also include health features extracted from measured variables. Overall health status is color-coded: green – good/ maintain, yellow – caution, possibility of required actions, and red – alert, when immediate attention required, often from a health provider. Frame to the left shows individual health indexes, i.e. health status of a single health feature that is integrated in a health index signature. Decomposition of a health index to individual features gives better understanding where attention should be directed.

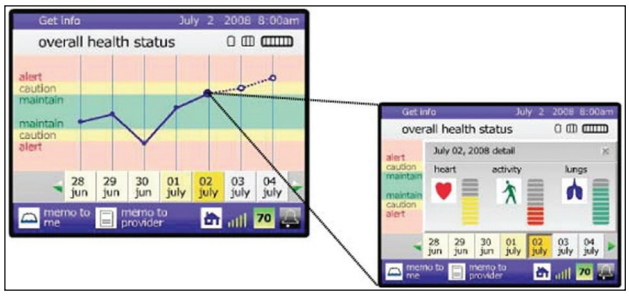

Figure 4. Display concept of the continuous monitoring of the heart failure subjects via mobile phone, developed by the Center for Future Health team. Frame to the right shows an overall health status display with the individual variables indexes. Display shown on frame to the left shows past, current, and predicted health indexes. Current date is highlighted.

Web Mapping in building Health index

Web mapping technologies have passed a long way from complex and expensive systems for geo-referencing and map displaying to extremely affordable, often free of charge and easy to use services. The open-source type applications led to the development of tools that enable highly demanding geospatial visualizations and help in detecting and solving various geospatial problems. Rapid expansion of mapping services, like Google Maps, Open Street Maps, Google Earth, Wikimapia, Ovi Maps, MapQuest, Yahoo Maps and GIS software such as: ArcGIS, GRASS and QGIS, help integrate web-oriented services to GIS [10,11].

The affordability did not bypass the Global Positioning System (GPS) technologies. Recently, we have witnessed its deployment in many devices such as but not limited to mobile phones, navigation systems, tracking devices, or vehicles. Also, many health monitoring systems have GPS units, which help locate users that need help faster [12]. Thus, it comes natural to integrate the GPS and web mapping systems.

Keeping track of patients' health conditions and representing such data on geographical maps can contribute to a better understanding of particular diseases, their causes and consequences in a certain area. Statistical records of patients who suffer from some disease can be georeferenced through marking several important elements such as patient's location, daily routes that a patient takes (going to work or other common routes), patient's habitual routes, etc., along with direct monitoring of the targeted group health. Real-time and direct monitoring of the patient's movement and activities would contribute to a much faster overview of some elements in a wider scope, elements that deal with the patient's living environment which can be further linked to the direct and indirect causes of a disease.

For the purposes of this paper, the following scenario is assumed - a healthcare center monitors patient's state in real time where some adverse

changes (anomalies in comparison to the normal functioning of the body) and patient's location at the time a change takes place are automatically marked on a map. Thus, each patient would have a unique overview of his or her health conditions during the time. The locations where some changes occurred, routes, time, relief, natural environment and other factors that might affect a change would be clearly marked on the map. Adverse changes tracked by the sensors could be connected to the patient's living environment (pollution of air, hilly terrain, noise, etc.) and other factors that can be systematically processed. A visual representation of adverse changes would enable a patient to alter one of the factors that directly or indirectly affect his or her disease. Such factors are only visible through geo-visualization (lack of greenery in a wider area, proximity of industrial areas, quarters of the city with some specifics related to stress, etc.).

Differences in intensity and number of adverse changes could be monitored along with the monitoring of patients with similar general health conditions and then be marked on the map. In accordance with these states, each patient would get a health index for the disease he or she suffers from which could reflect on the community health index of both narrow and wide patient's geographical vicinity.

A system that follows such states should have the ability to collect these individual cases and represent them on a unique map of some place as well as to pool monitoring processes of various diseases in order to create general health sense of the targeted area.

Some geographical locations would get quality and tolerance grades for a specific group of patients. It would allow patients to stay away from or insist on some geographical locations and routes that are graded as convenient for them through the health index. Healthcare centers and city authorities would get a chance to reconsider wider aspects of factors that increase the risk and negatively affect both individual and community health. In addition, this would make it easier to deal with such factors on some geographical location.

Let's assume the following scenario in order to represent how a part of a city could get its health factors for specific diseases or general health state in the area. There are 4 different zones with 100 patients each. The targeted zones are divided into four different colors and monitoring takes place in the predefined period of time. After it ends, we assume that different locations offer different factors which more or less improve or aggravate patient's health. It is possible that there are 30 cases of aggravation marked in blue, 42 in red, 67 in black and 22 in the yellow zone. The health index of the area in this case is obtained by dividing the number of patients with the number of adverse health changes that occurred in that area during the period of observation. The results are as follows:

- Blue zone: Health index-3.3
- Red zone: Health index- 2.4
- Black zone: Health zone-1.5
- Yellow zone: Health index-4.5

Figure 5. displays health index of a disease where higher value means better geographical environment for a patient.

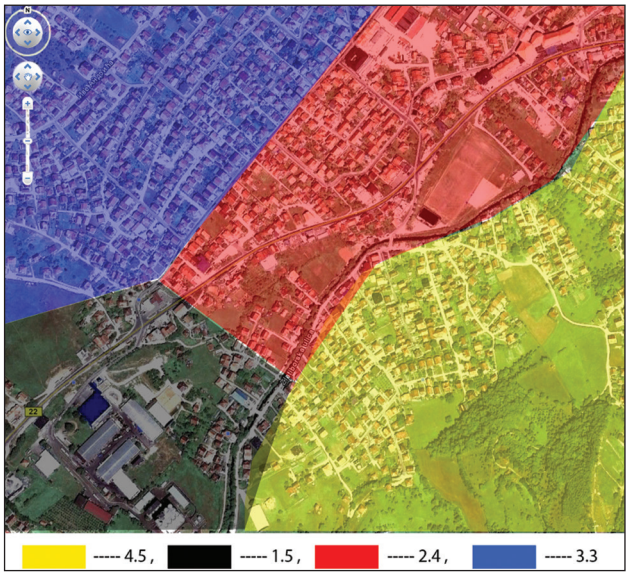

Figure 5. Health index in different parts of town

The Systems Symbiosis and Its Impact on Public Health

In Figure 6 is shown a plot of the symbiosis of a long-term monitoring health system and web mapping. There are many potential benefits of such system. We list and explain the most potent benefits below.

Known location: better resolution, hot spots, hot time intervals. Big data collected during continuous health monitoring of a person may be manipulated multifold to get a "personal" and

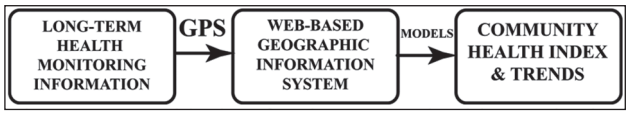

Figure 6. Symbiosis of a long-term health monitoring system and WBGIS. A long-term monitoring system collects real-time physiological information from individuals which are fed to WBGIS to create interactive time-varying maps to present time-varying community health visualization.

community real-time health maps with high resolution. Health data from health facilities refer to a data per area that the facility covers. With integrated GPS in health monitoring systems, any change in health status enters the statistics of the user's location, and thus increases map resolutions to a household. User can explore personal maps with the location health onsets and cross-reference with other users. Daily migrations of users can be followed and used to detect possible hot points where health warnings are more prone to happen. Temporal component of continuous monitoring can detect hot times, i.e. precise times of changes in environmental conditions that may trigger health warnings. A community Health index may be calculated for communities with user-defined boundaries. Also, community health models may be updated in real-time and used to predict the community health trends and help planning community needs. Additionally, impact of visitors to community health trends may be separated, and information noise reduced to minimum.

Social. Users can compare their personal data to community health data, and monitor changes in immediate neighborhood. Health facilities may be alerted ahead of time of possible rush for medical need. Such system would help local government plan preventative measures, issuing timely warnings and alerts, and monitoring of implementation and real-time impact of applied preventative health measures.

Multimodal Impact. The system will help: prevent, predict, or limit epidemic outbreaks, add to faster reaction time in cases of acute conditions, and to shorter reaction time between environmental changes to public alerts which may be particularly important for chronic patients, aid to better understanding of needs for local health acts, policies, and preventative measures, and enable better control of preventative measures. Another aspect of such comprehensive systems is better understanding of possible disease causes and consequences per area. The system could be expanded to the continuous monitoring of health of animals and plants.

Conclusion

Results from the collaborative research have multi-structural impacts that surpass the respective fields. A time-varying personalized data-rich health profiles are created by deploying new healthcare technologies for proactive health, with real-time data streaming of continuously monitored wide range of physiological signals. Thus, intelligent continuous health assessment and the GPS unit may be integrated in web mapping tools to create a system that maps the community health index updated in real-time.

Currently, data are statistically processed for defined regions or around landmarks, mostly for acute diseases that spread epidemically. Data from individuals are non-reliable due to possible subjectivity and lack of expert control, which increases information noise. The system that we suggest will decrease information noise and increase objectivity.

Development trends of the next generation medical devices are focused to portability and continuous monitoring. The trends redefine the meanings and positions of a hospital, treatment, diagnostics, wellness, patient, medical care, and prevention in the medical structures. Further, a proactive role of users of medical services is growing. Accordingly, the golden standards of health monitoring systems are expected to include prediction, personalization, prevention, and participation, now referred to as the P4 [1]. Future values of health index add a new dimension to personalized preventative health, by warning user to possible health changes (health index exceeds the green zone, Figure 2) ahead of time, and adding to the user's confidence. With the suggested system, the same will be expected from the community health monitoring and assessments.

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Multiorgan hydatid cyst with hydatid cyst uria

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Abstract

Hydatidosis is a zoonotic parasitic disease of livestock and has a high prevalence in some countries. The most affected organs are liver and lung. Spread of contamination to other organs occurs extremely rare. The case that is reported here was a 41-year-old woman who was hospitalized in the internal medicine ward of a hospital inTehran, Iran with pyelonephritis in abdomino-pelvic sonography she had multi syst in the liver and spleen. Further investigations including, CT-scan, serological tests, pathological studies detected hydatid cyst in liver, lung, spleen and right kidney. Moreover, evaluation of sputum sample revealed oral candidiasis. The patient also had hydatiduria during hospitalization. After diagnosis of the disease, treatment of hydatid cyst simultaneous with treatment of oral candidiasis was initiated.

Key words: Hydatidosis- zoonotic parasitic disease- hydatid cyst- pyelonephritis

Introduction

Echinococcosis is a parasitic zoonosis disease. The disease is common in many parts of the world such as Asia, Australia, and South East Europe. Since the disease is common in livestock and those who deal with them, in countries such as Iran, it is endemic among migrants from endemic areas. The body's first and second defense lines against infection of hydatid cyst are liver and lungs, with the contamination rate of 70% and 15%, respectively. After release from the two defense lines, larvae could spread through blood and lymphatic system all over body. The contamination rate of kidney and spleen are about 2%. Infections of skin, brain, heart, bone, cecum, breast, cervix, eye, seminal vesicles, and thyroid have been reported from around the world as case reports (1,2). The final hosts of Echinococcus granulosus worm are dogs. The worm is able to create cyst in its larval stages. Human, sheep, goats, camels, and cows are the accidental intermediate hosts, which may be contaminated by eating parasite eggs via vegetables, fruits, and foods. The main diagnostic approach of the infection is ultrasonography; and other imaging methods such as CT scan and MRI are also employed. Ultrasonography is the screening method of choice for the classified cysts .Diagnosis of hydatidosis is performed also with using of serological tests (2,3,4). The surgical approach is hydatidosis gold standard treatment. Benzomidazole agents such as albendazole and mebendazole either alone or combined with praziquantel (PZ) are used for medical treatment of non-surgical cases and as a additional treatment prior and post-surgery (5) In this paper, we reported a hydatid cyst in an uncommon organ.

Case presentation

The case was a 41-year-old household woman, living in a rural area with a history of flank pain, which has been treated with antibiotics. The patient was admitted in the internal ward of our hospital in the Tehran, Iran, with the initial diagnosis of pyelonephritis. In evaluating the patient's pain, difficult swallowing, dysuria, , fever, chills, nausea and vomiting associated with, and throat sores were also found. In the patient's previous visits, the diagnosis of renal stones was proposed by ultrasound studies. In urine tests, hematuria, pyuria, epithelial cells, and moderate bacteriuria were reported. Blood tests showed 18% eosinophilia, leukocytosis, high ESR, C - reactive protein (CRP) 2+, as well as low levels of hemoglobin and hematocrit. The findings of physical examination were fever, bilateral flank pain, , and malaise. The sizes of renal cysts were in the range of 2-22 cm. Imaging findings in hydatid disease depend on the phase of its growth. Complementary paraclinical investigations including a full scan of the abdomen and pelvis detected a cyst

of the size of 23× 18mm in the lower part of right kidney accompanied with hydronephrosis. Kidney stone was not reported. Irregular cystic lesions in the right lobe of liver were observed. Furthermore, a cyst similar to those in the liver was detected in spleen with 23mm diameter. The abdominal CT scan with oral and IV contrast and showed hypodense well-defined mass with smooth irregular wall in both lobes of liver lesions, and similarly in the spleen. Simple cysts were visible in both organs. The size of the liver and spleen was larger than normal. In right kidney, a cortical cyst with diameter of 27 mm was observed. Echogenicity of right kidney increased slightly. Moderate hydronephrosis in right kidney was evident also. There was no stone in the bladder. The left kidney had normal echogenicity without stone and hydronephrosis.

Figure 1. Gross examination on of the specimen revealed multiple cysts and daughter cysts in urine

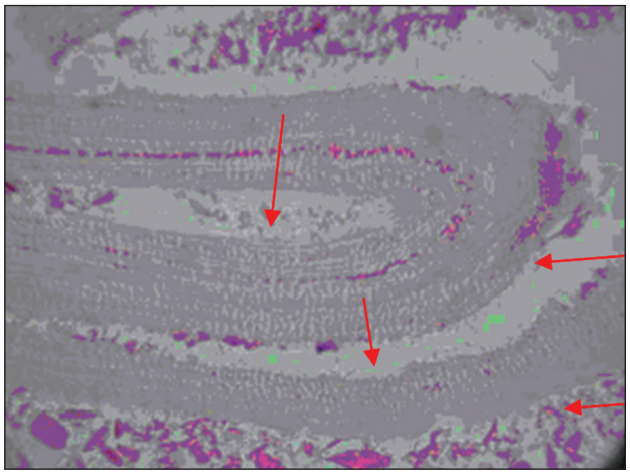
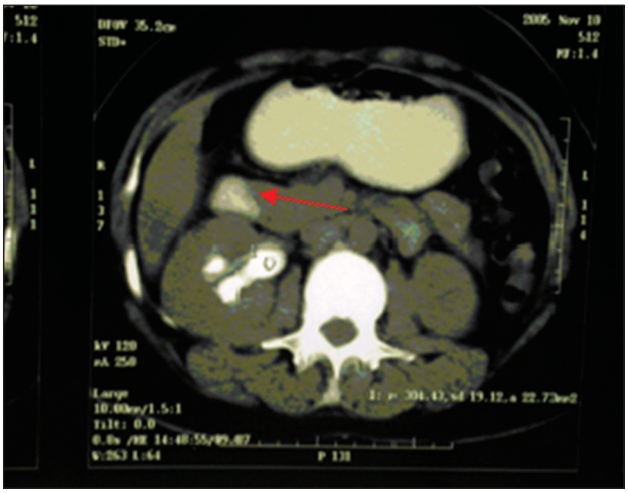
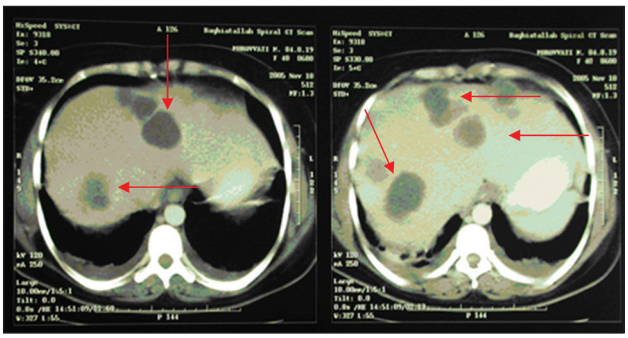


Figure 2. Microscopic examination showed the wall of cysts and daughter cysts lined by a nucleated germinative layer and outer nonnucleated hyaline layer composed of delicate laminations (×100)

The CT scan confirmed multiple scattered pulmonary cystic hypodense areas. During hospitalization and after discharge, the patient had cysts in her urine. Serological examination and Enzyme-linked immunosorbent assay (ELISA) were positive for hydatid cyst with the titers 1:640 (normal <1:32) and >1:400 (normal <1:100, bioMe'rieux), respectively.

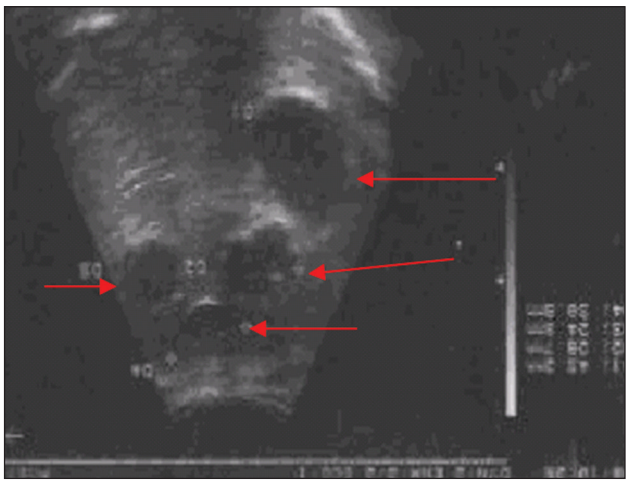


a

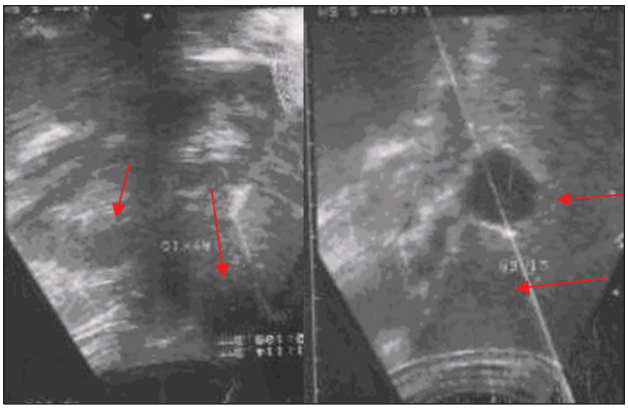


b

Figure 3. The abdominal CT scans with multi organ cyst lesion in liver (a), spleen (b) and kidney (c), respectively.



a



b

Figure 4. Abdominal sonography with cystic lison in liver , spleen and kidney respectively

After receiving the confirmation of pathology laboratory, oral candidiasis of the patient was treated. The patient had a history of working in animal husbandry. However, she did not have a history of previous infection with hydatid cyst .The patient was discharged after recovery from the kidney infection. Nevertheless, considering the presence of multiple cysts in the lungs, kidneys, spleen, and liver; the patient received clinical care and medical treatment of hydatid cyst with albendazole (10mg/kgdaily for 4weeks).

Discussion

Hydatidosis is caused by Echinococcus granulosus worm larvae. The infection is a major public health concern. Hydatidosis has no specific clinical signs as a kidney disease. In some cases, the cysts are ruptured in the body and daughter cysts are released in the kidney into the urine, presented as hydatiduria. Daughter cysts look like grape clusters in the urine sample (3,4). Clinical evaluations of patients with kidney hydatidosis shows back and flank pain in most patients; however, renal hydatidosis does not have specific symptoms and the disease usually remains asymptomatic for several years. Hydatiduria is the only specific symptom for renal hydatidosis .Case reports of hydatid cyst in most patients are with symptoms such as vomiting, pyuria, dysuria, hematuria and fever, all of which were present in our patient. Eosinophilia is a common finding of the hydatid cyst infection that is seen in 50% of patients. Our patient experienced high eosinophilia. Further studies should be considered in patients with no symptoms of kidney stones who are presented with renal colic, and it should be kept in mind that renal colic can be a sign of kidney hydatidosis (4,6).

In hydatid cyst infection, the living environment plays an important role. The prevalence of the infection is higher in rural areas. Our patient also had a long history of working in a farm. Renal cysts have dangerous consequences in patients The patients are not aware in most cases, and the condition often leads to nephrectomy (7,8). Considering the endemic nature of the infection, its economic and health and sanitation burden, and the side effects such as hepatotoxicity, abnormal liver function, gastrointestinal symptoms, allergic reactions, leucopenia and alopecia arising from the medications, control of the disease should be considered as a very important health task in endemic areas.

Monitoring the hygiene of livestock slaughtering, treatment and prevention of infected dogs, and preventing dogs from entering livestock keeping yards are important measures in controlling zoonoses diseases. We emphasize that hydatidosis should be considered in the differential diagnosis of any cystic lesion chiefly in endemic regions. To achieve the diagnosis, evaluation of previous medical history and current signs together with the ultrasonographical and radiological findings are important (2,7,9).

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Effect of classical music on stress among preterm infants in a neonatal intensive care unit

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Abstract

Objective: The aim of this study was to observe the effects of music played in the neonatal intensive care unit (NICU) on stress symptoms, oxygen saturation, peak heart rate, and respiratory parameters among preterm infants.

Methods: The study was conducted from November 2004 to February 2006, and 26 preterm babies in the NICU at the Pediatrics Department of the Medical Faculty of Istanbul University were assessed. Written permission was obtained from their families. A music system was set up in the incubators of infants in the experimental group, and classical music was played for 1 h each day. Peak heart rate, oxygen saturation, stress symptoms, and respiratory parameters were observed before the music was played as well as 5 and 55 minutes afterward.

Results: A significant decline in stress levels was observed among the neonatal infants in the experimental group compared with those in the control group, but no meaningful difference in hospitalisation time or oxygen saturation was observed. The peak heart rate and respiratory parameters were below normal levels. Listening to classical music decreased stress among newborns in the NICU.

Conclusion: Listening to classical music decreased stress among newborns in the NICU. The results showed that neonatal intensive care nurses can use classic music in NICUs as it masks the ambient noise, decreases stressful behaviours and bradycardia, has soothing and stimulating effects, and facilitates sleeping.

Key words: music, preterm, intensive care, stress, growth.

Introduction

Music can be defined as the art of narrating feelings and thoughts with sounds or as the art of arranging sounds to express a sense of aesthetics (1). Music has been a means of expression throughout human history (2). Music has also been used for many years in the treatment of various diseases to increase well-being/happiness and decrease aches/pains as it has both sedative/calming and stimulant effects (1, 3, 4). Its use in health applications and in social life has gradually increased. Music therapy is currently being trialled for patients in all age groups, including babies, children, adolescents, and the elderly.

In hospitals, music is used in palliative care (5), intensive care (6), surgery (7), psychiatry, oncology (1), gynaecology, paediatrics, coronary care, radiation, chemotherapy, mechanical ventilation (8), in situations where medical procedures are performed (9, 10), in the treatment of symptoms such as pain and (11) anxiety (12, 13), to improve quality of life, and in spiritual healing (14, 15, 16, 17, 18).

The longevity of preterm infants has increased because of developments in medical technology. However, when preterm infants leave the intrauterine environment prematurely, they encounter the NICU, a very different environment, and undergo an adaptation process. Developmental deficiencies and neurological disorders may occur during this process, and the infants require long-term care for such problems (3, 17).

Services/care provided to infants in the NICU in line with progress in individual supportive developmental care over the past few years have decreased stress symptoms among neonatal/preterm infants. 'Individual Supportive Developmental Care' has been used to organise the behaviour of premature infants on the basis of the Synactive Theory developed by Heidelise Als, who has been researching the topic since 1980 (15, 19). Studies on the use of music/sound (classical music, lullabies, traditional music, mother/female voice, etc.) in individualised developmental care have shown that music has sedative and stimulant effects on preterm infants by masking undesired noise (20).

Preterm infants in the NICU are exposed to stress due to environmental adaptation to the ambient conditions of the NICU. Purposeful sounds, such as music, affect learning, are soothing, and have neurological development potential; they have begun to be used as therapy in NICUs to decrease stress, improve heart rate and respiration, speed up growth, and shorten the hospitalisation period (7, 21, 22). Today, music therapy is used as a means of reducing stress (13), accelerating growth (9, 23), facilitating transition to feeding, reducing pain, facilitating transition to sleep, ensuring positive changes in oxygen saturation level (SO_2) and peak heart rate values (6, 24, 25), and reducing the length of stay in hospital (12, 20, 26, 27, 28, 29).

The aim of the current study was to determine the effects of music on growth (assessed by weight, height, and head circumference), stress symptoms, oxygen saturation, peak heart rate, respiratory parameters, and hospitalisation period among preterm infants in an NICU.

Materials and method

The study was conducted among 26 preterm infants, 13 of whom constituted the trial group and the remaining 13 the control group (power: 0.80; β: 0.20; n: 13). The experiment was performed in the Neonatal Intensive Care Unit and Neonatal Special Care Unit at the Pediatrics Department in the Medical Faculty of Istanbul University between January 2005 and February 2006. The study was conducted in accordance with the Helsinki Declaration and was granted ethics committee approval. In addition, a study permit was received prior to the study being performed.

The inclusion criteria for infants were: weight, 1000–1500 g; stable within the initial 24 h after birth; no congenital anomaly, cranial bleeding or hyperbilirubinaemia; no intubation; and no family history of hearing loss beginning in infancy.

Hypotheses of the study

The following hypotheses were tested in relation to music therapy among preterm infants hospitalised in the NICU:

Hypothesis 1: Music decreases stress symptoms.

Hypothesis 2: Music increases anthropometric measurements (weight, height, head circumference).

Hypothesis 3: Music increases oxygen saturation levels.

Hypothesis 4: Music balances peak heart rate values.

Hypothesis 5: Music balances respiratory parameters.

Hypothesis 6: Music decreases the hospitalisation period.

Data collection tools

A Patient Consent Form, Infant Information Form, and Patient Follow-up Form, all of which were developed by the investigators in line with the literature, were used for data collection.

Points were allocated on the basis of the stress symptoms shown by preterm infants participating in the study, and average stress scores were calculated. Infants with no stress symptoms scored 0 points, those with mild stress symptoms scored 1 point, those with mid-level stress scored 2 points, and those with severe stress scored 3 points.

Stages of the study

The families of the infants who met the case selection criteria were interviewed, and the consent of the families who wished to participate in the study was obtained using the Informed Consent Form. The Infant Information Form was also completed for the infants. These forms were numbered starting from 1. Infants with odd number forms were included in the trial group and those with even number forms in the control group.

A music system was set up in the incubators of the trial group infants; 2 loudspeakers were placed at the feet of the infants within the incubator. A decibel measurement device was placed outside the incubator on a nearby counter, and it was connected to a power source after the maximum sound level was set at 45–60 dB. The microphone of the decibel measurement device was placed between the loudspeakers within the incubator to measure the sound level within the incubator.

The nurses were informed of the study and of the music system and its operation prior to the study. Routine checks of the preterm infants in the NICU are carried out at 3 h intervals. One of the nursing care sessions in the NICU was selected (the longest care session in the afternoon) and classical music was played to the preterm infants by

the nurses for 1 h during these sessions until the infants were discharged. The preterm infants were monitored while they were listening to the classical music and data were recorded twice weekly by the investigators.

Before the nursing session, the preterm infants were assessed and stress symptoms, oxygen saturation peak heart rate, and respiratory parameters were observed over 1 min before therapy and recorded in the Patient Follow-up Form. The music therapy session was then started and routine monitoring (temperature, respiration, pulse, blood pressure) and daily care (mouth, eye, skin care, etc.) of the infants was performed; they were also fed. After 5 min, the stress symptoms of the infants were observed, and their oxygen saturation and respiratory parameters were measured and recorded. The music was played for 1 h; 5 min before the end of the session and at the 55th min, the stress symptoms of the infants were again observed, and oxygen saturation, peak heart rate, and respiratory parameters recorded.

In order to follow-up the growth of the infants, their weight, height, and head circumference measurements at admission and on discharge were also recorded.

Dependent and independent variables

The independent variable of the study was classical music, and the dependent variables were growth parameters, oxygen saturation, peak heart rate, respiratory parameters, hospitalisation period, and stress symptoms.

Analysis of the data

Statistical Package for Social Sciences (SPSS) for Windows 10.0 was used for the statistical analysis. Besides descriptive statistical methods (percentage, average, standard deviation), a One-way Anova and Student's t-test was used for intergroup comparisons of parameters with a normal distribution, and a paired sample t-test was used for intragroup comparisons. For intergroup comparisons of stress parameters that were not normally distributed, a Kruskal Wallis test was used; the Mann Whitney U test was used to identify the group responsible for any differences, and a Friedman and Wilcoxon Sign test was used for intragroup assessments. Chi-Square and Fisher's Exact Chi-Square tests were also used. The results were within the 95% reliability range, and the significance level was set at $p < 0.05$.

Findings

When the sex and gestation week distributions of the infants were compared, there was no statistically significant difference, indicating that the groups were homogeneously distributed. Most of the infants were deemed Appropriate for Gestational Age. There was no statistical difference between the groups in terms of this diagnosis ($p > 0.05$).

When the infants constituting the study group were evaluated in terms of their physical measurements, the average weight of both groups was about 1 510 g, the average height was 41 cm, and the average head circumference was 29 cm at discharge. There was no statistically significant difference between the average weight, height, and head circumference measurements of the groups at admission and discharge ($p > 0.05$). The hospitalisation period for both groups was about 22–23 days on average. There was no statistically significant difference in hospitalisation period between the trial and control groups ($p > 0.05$).

According to Table 1, the oxygen saturation results of the trial and control groups were distributed between 95–98%. There was no statistically significant difference between the initial and final oxygen saturation values of the groups, but they were maintained within normal limits.

When the initial and final average peak heart rate values of the groups were compared, it was found that there was no statistically significant difference in heart rate prior to the music therapy session and that 5 and 55 minutes after the session was initiated ($p > 0.05$). Peak heart rate values were between 135–157 beats/min and were within normal limits in both groups. However, an observed decrease in heart rate from the first to final measurement was statistically significant for the control group. There was also a significant decrease in the peak heart rate of infants in the trial group at the 5th and 55th minutes of the 1-h music therapy sessions (Table 2, p: 0.039).

When the respiration parameters of the trial and control groups prior to the care session and at 5 and 55 minutes during the session were com-

Table 1. Comparison of the Initial and Final Average Oxygen Saturation (SO_2) Values of the Groups (S = 26)

SO_2 values		Trial (s = 13) Mean ± SS	Control (s = 13) Mean ± SS	t; p
Initial SO_2	Prior	97.8 ± 2.1	97.2 ± 3.1	0.512; 0.613
	5th min	98.3 ± 1.5	96.9 ± 2.9	1.530; 0.143
	55th min	98.7 ± 1.5	97.1 ± 4.7	1.177; 0.258
F; p		1.374; 0.196	0.017; 0.819	
	Prior-5th min	0.905; p: 0.383	0.315; p: 0.758	
	Prior-55th min	1.369; p: 0.196	0.129; p: 0.899	
	5th min – 55th min	0.768; p: 0.457	0.145; p: 0.887	
Final SO_2	Prior	95.5 ± 3.7	97.3 ± 1.8	1.614; 0.120
	5th min	96.7 ± 3.4	96.6 ± 2.4	0.066; 0.948
	55th min	97.3 ± 2.9	97.4 ± 3.5	0.061; 0.952
F; p		3.505; 0.086	0.005; 0.947	
	Prior-5th min	**1.185; p: 0.259**	**0.939; p: 0.366**	
	Prior-55th min	1.872; p: 0.086	0.068; p: 0.947	
	5th min – 55th min	0.743; p: 0.472	0.572; p: 0.578	

Table 2. Comparison of the Initial and Final Average Peak Heart RateValues of the Groups (S=26)

HPB values		Trial (s = 13) Mean ± SS	Control (s = 13) Mean ± SS	t; p
	Prior	150.5 ± 19.4	135.2±24.5	1.768; 0.090
Initial HPB (…/min)	5th min	152.8 ± 16.0	145.6 ± 17.0	1.102; 0.281
	55th min	143.8 ± 13.8	138.0 ± 16.6	0.965; 0.344
F; p		3.542; 0.039	0.253; 0.624	
	Prior-5th min	0.769; 0.457	2.087; 0.059	
	Prior-55th min	1.429; 0.179	0.503; 0.624	
	5th min – 55th min	2.251;0.044	1.889; 0.083	
	Prior	156.9 ± 18.6	149.5 ± 13.3	1.165; 0.255
Final HPB (…/min)	5th min	152.7 ± 14.1	153.6 ± 9.9	0.243; 0.810
	55th min	151.6 ± 15.3	143.2 ± 15.8	1.376; 0.182
F; p		3.505; 0.086	6.061; 0.030	
	Prior-5th min	0.549; 0.593	0.964; 0.354	
	Prior-55th min	1.804; 0.096	1.176; 0.262	
	5th min – 55th min	1.375; 0.194	2.803; 0.016	

pared, no statistically significant difference was identified (Table 3). When the study findings were assessed, it was found that the respiration parameters were within normal limits (27, 30).

The initial and final stress values were not statistically significant between the trial and control groups in general. However, when the trial group was examined, there was a significant difference in between prior stress values and stress values at the 5th and 55th minutes of the therapy session. The significant difference was due to a statistically significant decrease in the average stress scores between the prior and the 55th minute and between 5th minute and 55th minute (Table 4).

Discussion

Calabro et al. studied the effects of music on weight gain and physiological and behavioural conditions of infants, and reported that there was no difference between trial and control groups (31). Similarly, the current study revealed no significant difference in growth values and hospitalisation period between the control and trial grou-

Table 3. Comparison of Initial and Final Average Respiratory Values of the Groups (S = 26)

Respiratory values		Trial (s = 13) Mean ± SS	Control (s = 13) Mean ± SS	t; p
	Prior	58.5 ± 8.8	58.3 ± 10.3	0.041; 0.968
Initial respiration (…/min)	**5th min**	59.9 ± 8.9	59.8 ± 9.7	0.021; 0.983
	55th min	55.7 ± 6.8	54.5 ± 8.1	0.419; 0.679
F; p		1.518; 0.242	2.978; 0.048	
	Prior-5th min	0.744; 0.471	0.452; 0.660	
	Prior-55th min	1.232; 0.242	1.237; 0.240	
	5th min – 55th min	1.611; 0.133	2.327; 0.038	
	Prior	61.2 ± 11.2	59.2 ± 5.8	0.694; 0.494
Final respiration (../min)	**5th min**	63.8 ± 10.3	62.5 ± 8.4	0.251; 0.804
	55th min	59.4 ± 8.2	55.0 ± 7.0	1.462; 0.157
F; p		1.123; 0.310	4.230; 0.050	
	Prior-5th min	0.603; 0.557	0.540; 0.599	
	Prior-55th min	0.706; 0.494	1.575; 0.141	
	5th min – 55th min	1.457; 0.171	2.408; 0.033	

Table 4. Distribution and Comparison of Initial and Final Average Stress Scores of the Groups (S = 26)

Stress score		Trial (N = 13) Mean ± SS	Control (N = 13) Mean ± SS	U; p
	Prior	0.76 ± 0.83	1.00 ± 1.15	78.00; 0.722
Initial	**5th min**	0.92 ± 0.95	1.15 ± 0.89	73.00;0.525
	55th min	0.23 ± 0.59	0.76 ± 1.16	63.50; 0.167
		KW: 3.882; p: 0.038	KW: 0.765; p: 0.682	
	Prior-5th min	Z:-0.520; p: 0.603	Z:-0.416; p: 0.677	
	Prior-55th min	Z:-7.32; p: 0.083	Z:-0.680; p: 0.496	
	5th min – 55th min	Z:-2.021; p: 0.043	Z:-1.299; p: 0.194	
Final	**Prior**	1.07 ± 0.95	1.23 ± 1.23	82.50; 0.913
	5th min	1.00 ± 0.70	1.23 ± 0.72	69.50; 0.401
	55th min	0.46 ± 0.87	0.61 ± 1.04	78.00; 0.668
		KW: 5.450; p: 0.046	KW: 0.765; p: 0.682	
	Prior-5th min	Z:-0.302; p: 0.763	Z:-0.187; p: 0.852	
	Prior-55th min	Z:-2.705; p: 0.048	Z:-1.552; p: 0.121	
	5th min – 55th min	Z:-2.811; p: 0.040	Z:-1.814; p: 0.070	

U: Mann-Whitney U test KW: Kruskal-Wallis test

ps. When studies where the findings demonstrated faster physical growth and decreased hospitalisation period were examined, the music applied was usually classical music, traditional lullabies, ambient sound, or the mother's voice, and was in the mother tongue of the infants (18, 23, 32, 33). Taking into consideration the study environment, it is possible that listening to Mozart instead of classical Turkish music and traditional lullabies had no positive effect on growth values and hospitalisation period among the preterm infants. Our argument can be confirmed by the knowledge that hearing begins at the 20–22nd week of pregnancy, perception of speech begins after the 27th week, and the infants learn some of the basic characteristics of their mother tongue during foetal life. Furthermore, the environment will be perceived as more familiar by the foetus if the music played during the last trimester of pregnancy is also played during delivery (15, 18, 23, 34). In conclusion, hypotheses 2 and 6 could not be verified.

The lack of any difference in oxygen saturation values between the groups is similar to findings from other studies (6, 7, 16, 31). Our study results were, to some extent, in line with the findings of Standley's study (2001) where the oxygen satu-

ration values increased during the first day in the trial group but decreased subsequently (18, 23). In light of these results, it may be that the values initially increased to a certain extent due to the stimulating effect of the music, but then remained within the normal values due to the soothing effect of the music as it continued over the 22–23 days of hospitalisation. In conclusion, hypothesis 3 was not verified.

There was a significant decrease in the peak heart rate of infants in the trial group at the 5th and 55th minute of the 1-h music therapy session (Table 2, p: 0.039). This result relating to the initial measurements was also observed during the final measurements, but was not statistically significant. One reason for this might be the fact that the infants became used to the Mozart played to them for 22–23 days, and that the instrumental and rhythmic music only acted as a stimulant and kept the peak heart rate within the normal limits. These study results were similar to those of other studies (9, 16, 31).

When the within-group respiration parameters of the trial group were evaluated, no significant difference was observed, whereas there was a significant difference in the values of the control group. As with the peak heart rate measurements, this may be due to the continuing stimulating effect of the music on the trial group, which balanced out the respiratory parameters. In conclusion, hypotheses 4 and 5 were verified.

A decrease in agitation and crying was observed in the literature as well as in the current study (35, 36). In conclusion, hypothesis 1 was verified.

Conclusion and suggestions

Classical music therapy has been used in NICUs as it masks the ambient noise, decreases stressful behaviours and bradycardia, has soothing and stimulating effects, and facilitates sleeping. Considering that mothers listen to music in their own language, it is recommended that studies assess the effectiveness of Turkish classical music in the NICU, and measure the effects of music therapy in the NICU during different procedures (e.g., taking blood samples).

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Multiple esophageal cancer and balloon dilatation of late postoperative stenosis

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Abstract

Multiple esophageal cancer is a rare disease and is often diagnosed at an advanced stage, with many patients found to have locoregional or metastatic disease at the first visit to surgeon. Because of this, leading treatment efforts are often focused more on symptom palliation and improving patient quality of life then on radical surgery treatment. We report a case of a patient with a successful radical surgical treatment of advanced malignant disease of the esophagus – rare double cancer of esophagus, and the successful treatment of a late postoperative complication - dilatation of stenosis of esophageal-gastric anastomosis which was performed with stapling technology. A successful rehabilitation of the late complication of benign stenosis of anastomosis was verified by endoscopic and X-ray examination of the esophagus, followed by the patient's general condition improvement. Radical surgical intervention with complete removal of tumor is sometimes possibile and justified, despite the price of mutilating surgery.

Key words: primary cancer, esophagus, stenosis, balloon dilatation

Introduction

Synchronous multiple primary cancer is defined as two or more primary cancers occurring in an individual simultaneously. (1) Esophageal cancer accounts for only 1% of incident malignancies in the U.S.A and Western Europe. (2) Its incidence is increasing rapidly compared to other malignancies. The etiology of synchronous multiple primary cancers is still unclear, strong epidemiologic evidence implicates tobacco as the main carcinogen and alcohol as a promoter of carcinogenesis. (3) The main symptom is dysphagia while other symptoms may be odinophagia, dyspnea, cough, weight loss, hoarseness due to *laryngeal nerve infiltration*, retrosternal pain, sialorrhea. Diagnosis of esophageal cancer involves a medical history, pathohystologically verified endoscopic examination, imaging procedures. (4) The late postoperative complication after radical surgery of esophageal cancer can be benign stenosis of esophageal-gastric anastomosis. (5) We report a case of a patient with a successful radical surgery treatment of advanced malignant disease of the esophagus – rare primary double cancer of esophagus, and the successful treatment of a late postoperative complication - dilatation of stenosis of esophageal - gastric anastomosis which was performed with stapling technology.

Case report

A 58-year-old patient with dysphagia, vomiting and weight loss was admitted to Surgical Clinic (Clinical Center Kragujevac, Serbia). Biochemical analyses, clinical and imaging studies were done after the admission to hospital. X-ray examination revealed esophageal passage dysfunction and the contrast study revealed 7-centimetre-long luminal narrowing. Endoscopic examination revealed ulcerative lesion spreading to the two thirds of the circumference of the lumen and further examination was technically impossible. MDCT examination showed middle and distal thoracic segment thickening. Solitary mediastinal lymph node (11mm) was found during the examination. The elective operation was indicated. After right thoracotomy and an upper median laparotomy, a subtotal esophagectomy and Ivory-Lewis esophago-

gastroplasty were performed. Reconstruction of digestive tubus was performed with endoluminal circular stapler. In addition, mediastinal lymphadenectomy with partial resection of medial pleura and pericardium were accomplished. Pathohystological analysis of the resected part of the esophagus containing two tumour changes was done, as well as the analysis of one lymph node and resected parts of pleura and pericardium. Phatohystologicaly the both tumors were invasive squamous cell cancer – histological gradus I – well-differentiated type, nuclear gradus II, pT4N1-2/2-Mx. The ulcerated esophageal carcinoma was present in the upper part while the lower part showed the infiltrative forms. The serial sectioning showed the signs of vascular structure invasion and perineural invasion with lymphocytyc stromal response. Proximal and distal margins of the resected specimen were free of invasive carcinoma. (Figure 1-4). Postoperative course was uneventful. The patient was treated with both chemotherapy and radiation therapy. Six months after the chemotherapy the patient started throwing up. Six months after the operation, the patient complained of vomiting. Endoscopy was performed and showed anastomotic sub-stenosis and proliferation of fibrous tissue but without malignant recidives (Figure 5). X-ray and MDCT examination were used to verify the diagnosis. After this, the first balloon dilatation was performed and the patient felt well for a month (Figure 6), and it was followed by the second one during which the effect of post dilation was achieved (Figure 7 and 8). A year after the surgery the patient felt well, without any subjective complaints.

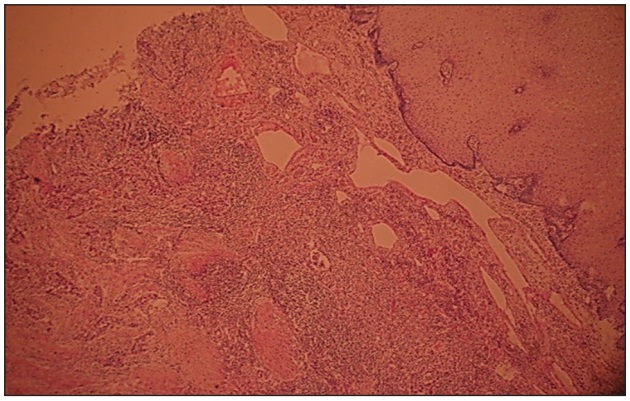

Figure 1. Tumour structures with keratin pearls

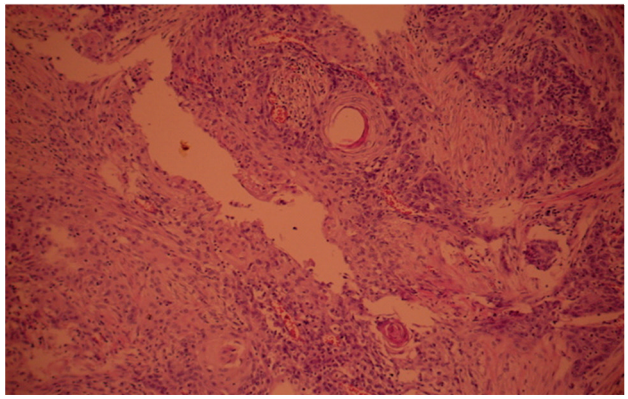

Figure 2. Tumour structures with keratin pearls

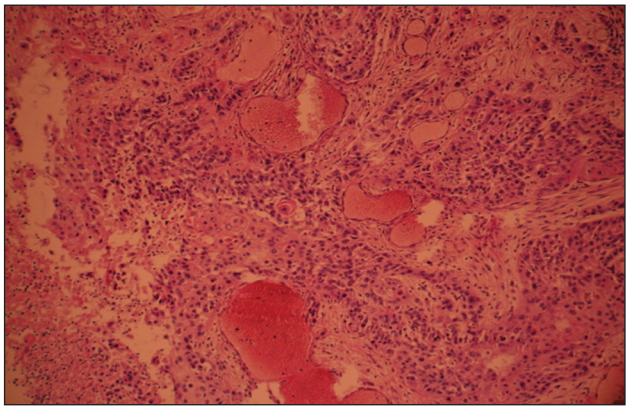

Figure 3. Solid tumour structures lining the blood vessels

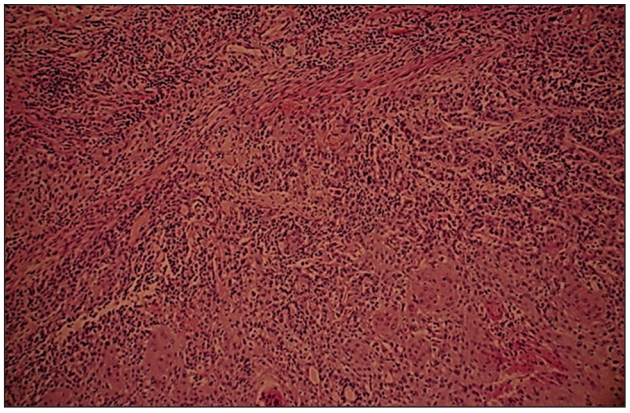

Figure 4. Stromal mononuclear infiltrate

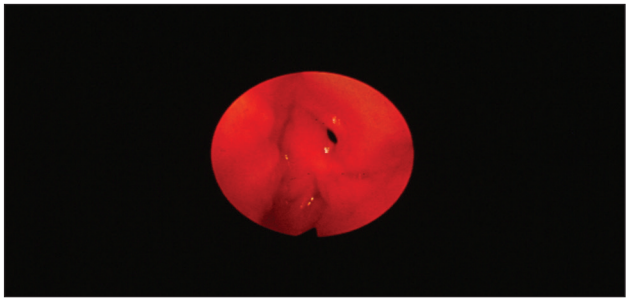

Figure 5. Endoscopic finding before the first balloon dilatation

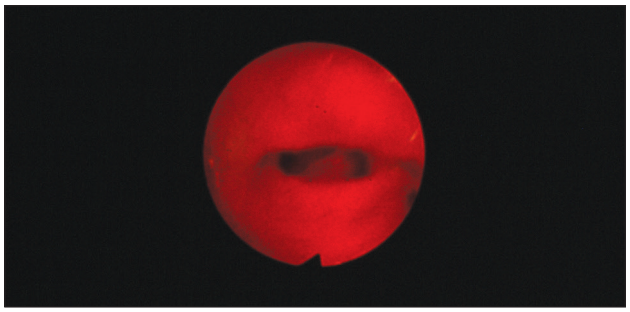

Figure 6. Endosopic finding after the first balloon dilatation

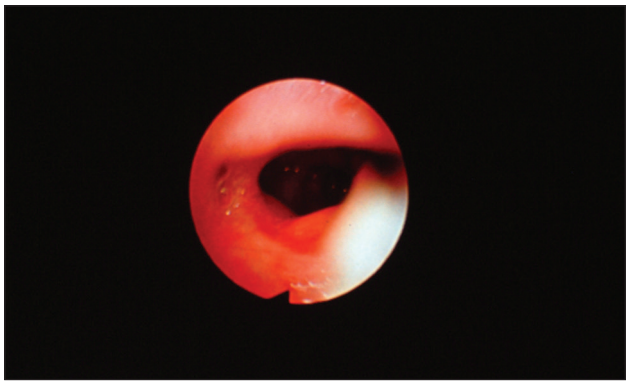

Figure 7. Endoscopic finding after the second balloon dilatation

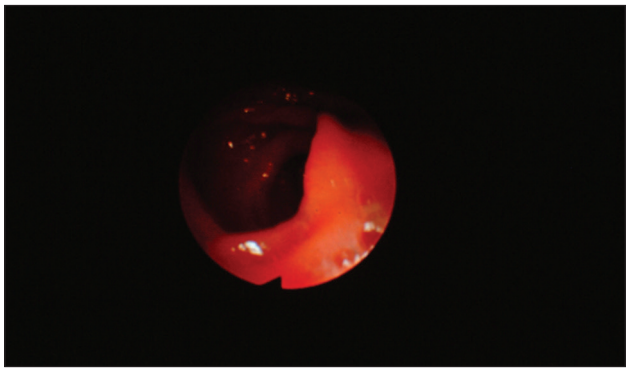

Figure 8. Endoscopic finding, anastomosis view

Discussion

The incidence of synchronous multiple primary carcinoma, defined as two or more primary cancers occurring in an individual simultaneously, is low and it varies from 3.6% to 27.1%. (1, 6) The rising incidence of esophageal cancer over the past two decades coincides with a change in histologic type and primary tumor location. Adenocarcinoma of the esophagus has slowly replaced squamous cell carcinoma as the most common type of esophageal malignancy in the United States and Western Europe. Within the United States, the reported mean incidence of esophageal cancer in patients younger than 80 years is 3.2 per 100,000 persons, with an overall male-to-female ratio of 3:1. (2, 7, 8) *However, countries with the highest incidence of this cancer are Iran, Japan and China, probably caused by food. (*9, 10) The etiology of synchronous multiple primary cancers is still unclear, strong epidemiologic evidence implicates tobacco as the main carcinogen and alcohol as a promoter of carcinogenesis. (3, 11) Other potential risk factors include hot beverages (12), nutritional deficiencies (13), pickled vegetables, nitrosamine-rich food (14), some genetic factors (15, 16), MDCT protocols (cardiac and pulmonary CT angiography) for the younger patient population (17) and radiation therapy is also associated with esophageal cancer. (15, 18) *Cases of synchronous multiple primary esophageal cancer are rare, but the surgeons must be aware of such cases. (19,* 20) For some reason, synchronous multiple primary cancers of the esophagus can often be overlooked at the time of diagnosis. Diagnosis of esophageal cancer involves a medical history, pathohystologically verified endoscopic examination, imaging procedures (esophagography, MDCT, MRI, PET-CT) (4). Preoperative staging of esophageal carcinoma appears to be the main indication for MDCT. (21) MDCT can effectively display the shape, size and position of the tumor, determine the tumor invasion range, lymph node metastasis, distant metastasis and provide evidence for clinicians to predict the operation scheme for esophagus cancer. (22) The differential diagnosis of patients includes malignant changes (squamous cell carcinoma, adenocarcinoma, sarcoma, melanoma, lymphoma, melanoma, carcinoid), benign changes (leyomioma), esophagitis (GERD, caustic esophagitis, infectious esophagitis, scleroderma, radiation esophagitis), Barett' esophagus (esophageal lining (columnar epithelium), including normal stomach lining, of 3 cm or greater in length). Esophageal cancer spreads can be per continuitatem, lymphatic spread or hematogenous metastasis. Lymphatic metastases or satellite tumor nodules from esophageal cancer that has spread via the mucosal lymphatic plexus may manifest as a discrete implant remote from the primary lesions. The esophagus has no serosa so tumor can spread more easily through the esophageal wall.

The neighbouring organs are easily invaded, and tumor can spread to trachea, bronchial tree, lungs, aorta, pericardium, laryngeal nerve, etc. Approximately 10% of patients with esophageal cancer can have a tracheoesophageal fistula. The rate of lymph node metastasis is up to 80% in patients with esophageal cancer. Metastases can be found in three large groups of nodes: cervical, abdominal and thoracic nodes. Hematogenous metastases are often found in patients with advanced esophageal cancer. The most common sites include the liver, lungs, bones, brain and adrenal glands. (23) There are several types of treatment: surgery, radiation therapy (pre and postoperative) and chemotherapy (pre and postoperative). Preoperative radiation and chemotherapy can be used to improve local control by reducing tumour bulk. Esophageal resection can be performed either as the curative or palliative treatment, depending on the stage of the disease and the patient's condition. Treatment for esophageal cancer depends on a number of factors, including the stage of the disease, the size, location, extent of the tumor, the general health of the patient, the patient's age, the patient's nutritional status, surgeon's experience, etc. Depending on the lesion, the removal of the esophagus or a portion of it can be performed. Intrathoracic esophageal-gastric anastamosis is usually performed for reconstruction after lower-third esophagus resection, as we done to our patient. Many circular and linear staplers are characterized by lower percentage of dehiscence, easier anastomosis, etc. There are some disadvantages, too. One of them refers to relatively high presence of anastomotic stenosis, like we diagnosed at our patient and treated it with success. (5)

Conclusion

Stenosis of the esophageal-gastric anastomosis is one of the common postoperative complications of esophageal surgery. A patient with this complication who complained of dysphagia was treated endoscopically by balloon dilatation of the anastomosis. A successful radical surgery treatment of a rare multiple primary esophageal cancer was performed, as well as a successful treatment of late postoperative complication which was confirmed by endoscopy and X-ray examination. Double malignant tumour of the distal esophagus in many cases sounds like inoperable and incurable disease. In a small number of cases it is possible to perform the partial esophagectomy, and we performed it on our patient due to his age and promising postoperative recovery.

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University students' knowledge about fertile period

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Abstract

Objective: The aim of the present study is to identify the knowledge of the university students, who are from a university in a developed city, about the fertile period during which women can get pregnant.

Methods: Research is a descriptive and cross-sectional study. Study population consisted of 2473 students from a university located in west part of Turkey. Sample included 1291 of those students. Data collected from questionnaires answered by the students were analyzed on the computer by using percentile and Chi-square statistical tests.

Results: The mean age of the participants is approximately 23 and the ratio of males to females is close. The ratio of students who have sexual relationship experience is 38% (11.6% females; 66.6% males). 43.1% of the students have grown up in Aegean Region, and remaining students have grown up in other parts of the country. When investigating students' knowledge about fertile period during which pregnancy might occur 40% of students correctly identified fertile period as "two weeks before expected menstruation" Half of female students, and one third of males correctly identified fertile period. Knowledge level of fertile period is higher among students who have grown up in Aegean Region than those have grown up in other regions *($p<0.05$)*.

Conclusions: Every 6 students out of ten either don't know fertile period or misinterpret it. Aegean Region is more developed as compared to other regions. Socio-economic and cultural characteristics of this region positively influenced young people's knowledge about fertility period.

Key words: University student, youth, fertile period, knowledge, reproductive health, culture.

Introduction

World Health Organization identifies the ages between 15 and 24 as "young". [1]. Today there are approximately 1.2 billion young who are between 15 and 24 [2]. This age period, which includes transition from childhood to adulthood, is an important period during which physical, psychological and sociological changes are experienced, some behaviors and habits are gained and an adult lifestyle is determined. Health habits and sexual behaviors are also shaped during this period. Therefore, it is very important that sexual health/ fertility health should primarily be considered in adolescent education. Previous research show that young people have insufficient knowledge about fertility health [3, 4] and that while they were informed they show safe behaviors regarding fertility health [5, 6]. The fact that young people in the world have insufficient knowledge about fertility health and the importance of education in fertility health have also mentioned in international conferences [7, 8].

Population of Turkey is approximately 75 million [9]. Significant part of the population (approximately 13 million, 17%) consists of young people between the age of 15 and 24, and most of these people are university students. According to higher education statistics there were 3,296,373 university students in 2009 [10]. This number constitutes 26.3% of young population and 4.5% of total population.

Research on young fertility health conducted in Turkey showed that females and males have insufficient knowledge about sexual health and fertility health [11-23].

Unwanted pregnancy is one of the important fertility health problems among young people. Young people should know birth control methods and use to avoid unwanted pregnancy. However, effective

usage of family planning methods mostly depends on knowing during which period the woman can most likely become pregnant in her menstrual cycle. Therefore, understanding the basic fertility physiology is a prerequisite to apply all birth control methods effectively especially withdrawal method, which is the most commonly used in Turkey [24]. Özcebe et al. [12]'s in their "2007 Turkey Youth Sexual and Reproductive Health Survey" research reported that young people have insufficient knowledge about woman-men fertility organs and their anatomy and physiology and that 27.4% don't have accurate knowledge about fertility period. However, as people's age, education and socioeconomic status increase, and for people who live in urbanized regions fertility health knowledge also increases. However, studies conducted by university students showed that unmarried students have already active sexual lives and that their knowledge about sexual health/fertility health is insufficient. [13-18, 20, 21, 23, 29-32].

The city in which the present study was conducted is a more modern, has a higher literacy rate and welfare level, younger population, and more popular for culture and sea tourism than many other cities in Turkey [33]. It is predicted that these characteristics of the region might influence whether young people know fertility periods.

The aim of the present study is to identify whether university students of Aydin know fertility periods during which women can get pregnant.

Methods

Study design, setting and sample

This research is a descriptive and a cross-sectional study. The research was conducted in Aydin, which is located in west part of Turkey. City of Aydin, with a population of 250,000, is a modern city. Its literacy rate is high, and it is well developed with its agriculture, industrial and touristic institutions. 17.4% of its population (43,625) consists of young people between the age of 15 and 24 [34]. The university located in the city has approximately 20,000 students.

There 10 faculties and junior colleges belonging to Adnan Menderes University. Study population consisted of 2473 registered senior students of Adnan Menderes University during 2009-2010 academic years. Sample, included 1291 undergraduate senior students who participated to the class when the study was conducted and who volunteered to participate to the study. The data were collected by questionnaires between February and May during spring semester in intro classes which most students from all faculties and junior colleges attend. Students were given informed consent about the study and answered the questions by themselves on the questionnaires, which were given to them with a sealed envelope.

Ethical considerations

Written consent forms were obtained from the university, administrations. The studens were informed about the purpose of the study,verbal and written consent was obtained as well. The research was granted by Adnan Menders University Scientific Research Unit.

Statistical analysis

Statistical analysis was conducted using SPSS for Windows (Version 11.5; SPSS Inc., Chicago, IL, USA). A chi-square test, t test and percentile tests were used for comparisons among categorical variables. A p value <0.05 was considered statistically significant

Results

Students are between the ages of 20 and 35, and the mean age is 22.7±1.7. The ratio of males to females is close, most students are unmarried, and the ratio of students who have sexual relationship experience is 38% (11.6% females; 66.6% males). 43.1% of the students reported that they have grown up in Aegean Region, and remaining students reported that they have grown up in other parts of the country (Table 1).

When investigating students' knowledge about fertile period during which pregnancy might occur 40% of students correctly identified fertile period as "two weeks before expected menstruation" Half of female students, and one third of males correctly identified fertile period. Yet, other students either had no idea about fertility period or they had incorrect knowledge about it (Table 2).

Figure 1 shows the relation between students' knowledge about fertility period and the regi-

ons that they have grown up. According to this graph, knowledge level of fertile period is higher among students who have grown up in Aegean Region than those have grown up in other regions *(x^2=8.47, p<0.05).*

Table 1. Some characteristics of students' (N=1291)

Characteristics	n	%
Age		
20-24	1138	88.2
25≤	153	11.8
Gender		
Male	617	47.8
Female	674	52.2
Marital status		
Married	25	1.9
Single	1266	98.1
Residence		
At home with family/relatives	178	13.8
At dormitory	273	21.1
At home with friends	727	56.3
Alone	113	8.8
Region of born and grown		
Aegean Region	557	43.1
Other regions	734	56.9
Sexual intercourse experience		
Yes	489	37.9
No	802	62.1

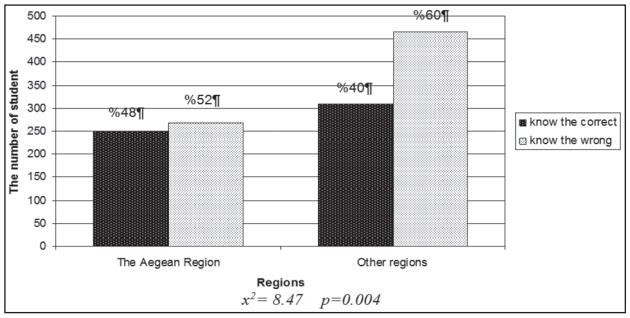

Figure 1. The relation between students' knowledge about fertility period and the regions that they have grown up (N=1291)

Discussion

Students participated to the study are on average 23 years old. Every 4 students out of ten had sexual experiences and 4 out of 10 knew fertile period accurately. The finding that 30% of students don't know fertility period is an important finding. Research conducted in Turkish society and universities showed that knowledge level about fertility period during which a woman has the highest probability of getting pregnant in her menstruation cycle is low [12-14, 24]. Other researches in the world were shown similar results [25-28].

According to Turkey Demographic and Health Survey, 2008, among married women between 15 and 49 26% knows fertile period accurately, 30% don't know and remaining unmarried women have inaccurate knowledge [24]. A national study conducted in Turkey identified that 27.4% of young people accurately know fertile period [12]. Other studies conducted by university students indicated this ratio as 37% [13], 59% and 31% [14]. Students in our study know fertility periods better than students from rural regions such as Inonu [13] and Dicle [14] Universities and know less than students from Hacettepe University [14], which is located in capital city of Turkey, Ankara. Half of female students (48%), and one third of males (32%) correctly identified fertile period. Koluaçik's research in [13] İnönü University (43%-27%), Akin et. al's research in [14] Hacettepe and Dicle University (%67-%48 and %43-%23) females who accurately knows fertility periods are higher than males. This difference implies that males think that women are more responsible to know fertility period than men.

City of Aydin is a more modern city than many cities of Turkey. Its education level, especially women's education level is higher than avera-

Table 2. Knowledge about fertile period of students

Period of pregnancy may occur	Male		Female		Totally	
	n	%	n	%	n	%
After the menstrual bleeding	144	23.3	183	27.2	327	25.3
During menstual bleeding	36	5.8	8	1.2	44	3.4
Two weeks before expected menstruation	195	31.6	321	47.6	516	40.0
Every time	8	1.3	13	1.9	21	1.6
Don't know	234	37.9	149	22.1	383	29.7
Totally	**617**	**100**	**674**	**100**	**1291**	**100**

ge. Birth rate is under Turkey's average [33-35]. There are seven geographical regions in Turkey. Aegean region to which Aydin also belongs, takes the second place in "socio-economic development index according to geographical regions" [33]. When investigating the effect of the region where a person has grown up on the knowledge level of the fertility period, it was found that differences between regions were statistically significant ($p<.05$), and that knowledge level of fertile period is higher among students who have grown up in Aegean Region than those have grown up in other regions. Socio-cultural characteristics of the region can influence children's knowledge of fertility health during their growing periods. In their research conducted in two universities from two different regions, Akin et al. [14] stated that a region where an individual has grown up influences one's knowledge related to fertility health. Some researchs in turkey and other countries reported that as education level and welfare level increase fertility period knowledge increase [12, 25, 26].

As a conclusion, in our research young people's knowledge about fertility period is found to be low. The finding that one third of young people don't have any idea about fertility period during which pregnancy is a high probability is an important finding of the present research. Males' knowledge about fertility period is less than females' knowledge. Young people who have grown up in Aegean region have better knowledge about fertility period than young people from other regions. In Turkey, every four young people out of ten are university students. University education is an opportunity to increase fertility health knowledge of these young people who are the leaders of the future. In this respect, universities, which are regarded as the last step of formal education by most young people, have important responsibilities for them.

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Sexual behaviour and contraceptive use among young people in Montenegro

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Abstract

Background: Knowledge about sexuality is an important component that affects the formation of sexual behavior, but it is also very important to emphasize the influence of other psychological components associated with behavior, such as values, belives and attitudes.

The aim of this research is to assess the degree of threat to reproductive health of students through analysis of their sexual behavior.

Methods: The study of students' behavior in relation with the use of contraceptive methods was carried out as a cross-sectional study. The study sample was composed of 10% out of the total number of students at the University of Montenegro. Faculty response rate was 90%, while the student response rate was approximately 87%. Therefore, the study included 1804 students from different generations which makes 9.3% of all students of the University of Montenegro. Out of the total number of students, around half of them were sexually active and their behavior in relation with the studied aspects were analyzed in this paper.

Specifically defined questionnaire was used as a research instrument, and its adequacy was pretested on the fifth year students of the Faculty of Medicine in Podgorica. Descriptive statistical methods were used for statistical data processing. Data were analyzed using SPSS statistical software v. 13.0.

Results: The majority of participants of both sexes, more commonly girls than boys, indicated that during sexual intercourse always use some of contraceptive agents. One in six respondent stated that doesn't use contraceptive agents. Research has shown that there is a correlation between gender and students' attitude about the safety of contraceptive methods used.

The respondents of both sexes stated that a decision on the application of contraceptive method make together with partner. Research has shown that most students believe that their knowledge about contraceptive methods, the importance, methods of use and disuse effects is sufficient. Students, more often girls than boys, assess availability of information regarding contraception as unsatisfactory.

Discussion: Global survey on attitudes and habits of young people regarding use of various contraceptive methods, has shown that there is inappropriate behavior among young people. This study has shown unsatisfactory behavior of young people in the field of reproductive health, as evidenced by the fact that one in six respondent does not use contraceptives.

Conclusions: Almost every sixth respondent does not use any contraceptive method. Respondents who use contraceptives evaluated them as partially safe. They usually make the decision on the type of contraceptive agent with partner. They consider their knowledge about contraception sufficient, but they are not satisfied with the availability of information related to contraception.

Key words: reproductive health, contraceptive methods, young population, knowledge

Introduction

Sexuality is a complex dimension that does not imply only sexual contact but also the need for acceptance, feelings, responsibility, knowledge and values, communication, sexual identity and other components that influence and determine the behavior in this area. Large number of components, such as hereditary, physical, psychological and social, determine sexual development. Unlike the biological impact, which is relatively stable component, the social impact on sexual behavior is changing, which reflects on sexual behavior among young people (1).

Knowledge about sexuality is an important component that affects the formation of sexual behavior, but it is very important to emphasize the influence of other psychological components associated with

behavior, such as values, beliefs and attitudes (2). It is clear that behavior is largely shaped by family, religious values and also with the values of peers and close friends. Family have important influences on the sexual behavior of children in puberty and adolescence. Through education, it influences the formation of personality and adoption of moral principles. Degree of adoption depends on manner in which family influences (3).

Modern trends in society have caused the increase in sexual activity among young people. This is manifested by the growing proportion of young people who are sexually active, increasing number of those who have first sexual experience in early adolescence and lowering the average age when first sexual intercourse is realized. More than three quarters of girls and 85% of boys in America, have their sexual experience before the age of nineteen (4). Different studies in some European countries indicate that half of young men and something less than half of young women have their first sexual experience before the age of 18 (5).

Sexual activity opens up new health problems, where the significance of the risk for reproductive health depends on the adopted model of sexual behaviour, as well as the many other determinants, physiological and health habits of individuals, and number of factors from socio-cultural environment. The discrepancy between the biological and psychosocial maturity creates the possibility for high-risk behaviours that could undermine the psychological, physical and reproductive health of young people (6). Early age of involvement in sexual intercourses, multiple sexual partners, associated with practicing unprotected sexual intercourse, are significant risk factors, indicating the need for better education and information in order to achieve responsible sexual behavior and to protect the reproductive health of young population (7).

Later engaging into sexual relationships, reducing number of sexual partners and increased condom use are ways to reduce the incidence of sexually transmitted infections and unwanted pregnancy in teenagers (8).

Given that mentioned health disorders of young people are generally conditioned, primarly by their risky behaviour and irresponsible attitude towards health, prevention can be used to reduce their spreading (9)

The aim of this research is to assess the degree of threat to reproductive health by analyzing students' sexual behaviour.

Method

Research on the student's behaviour and use of contraceptive methods was carried out as a cross-section study. The study was designed and coordinated by experts from the Institute of Public Health.

The survey was conducted among the students of University of Montenegro on a sample of 10% of the total number of students. Given that currently in Montenegro there are 19 325 students, survey was supposed to include about 1933 students. The number of respondents per university unit was defined in accordance with the number of students attending particular university. Considering that some faculties did not give consent for research implementation, the response rate of university units that have agreed to implement survey among their students was about 90%. Out of 1933 surveyed students, the response rate (their consent to the survey) was 87%, so the study included 1804 students of different generations, which makes 9.3% of all students of the University of Montenegro. Out of total number of surveyed students, about half of them are sexually active and their behaviour in relation with the studied aspects have been analyzed in this paper.

Approval to conduct research was obtained from the management of the University of Montenegro. Especially designed questionnaire was used as an instrument for data collection. Questionnaire was pretested for adequacy on the fifth year students of the Faculty of Medicine, University of Montenegro. The questionnaire consisted of 25 closed-type questions.

Statistical methods: Data were analyzed using SPSS statistical software v. 13.0.

Methods of descriptive statistics were used for statistical data analysis (frequency distribution of qualitative characteristics and relative numbers) and nonparametric methods for testing the significance of the relationship between awareness of students and knowledge about family planning, and also the relationship between attitudes and knowledge about contraceptive methods with the sexual behaviour of students.

Results

Most respondents of both sexes indicated that during sexual intercourse always use some of the contraceptive agents and more frequently girls than boys, while about 15% of respondents never use contraceptive agents. Girls more frequently than boys claimed that they do not use any form of contraception (on average one in five girls do not use contraception) (Table 1).

Research has shown that there is a correlation between gender and attitude toward the safety of contraceptive agents. Girls more frequently than boys (86.8%) expressed the view that contraceptive agents they use are safe or partially safe (86.8%). Lowest number of students (4.9%) and significantly more often girls (66.7%) than boys (33.3%), believe that the agents used for contraception are not safe (Table 2).

The largest number of respondents of both sexes stated that the decision regarding use of contraceptive methods make with their partner (63%), and this attitude is more common in girls than in boys. Boys more often than girls leave the decision on the use of contraceptive methods to partner, while the girls compared to boys more frequently make decisions on the type of contraceptive method by themselves (Table 3).

Research has shown (Figure 1) that the largest number of students considered that their knowledge about the importance of using, method of application and the consequences of not using contraceptive methods is sufficient (44.4%), followed by those students who evaluated their knowledge as very good (23, 9%), than those who evaluate their knowledge as excellent (16.3%), insufficient (11.9%) and least number of students believe that they do not have any knowledge about contraception (3.4%). Girls compared to boys assessed their knowledge with better grades, while many boys think that they do not have knowledge about contraception or it is insufficient.

Graph 2 shows the attitude of students regarding the possibilities of obtaining information in relation to contraceptive methods. Students, more frequently girls, estimated that the possibility of obtaining information related to contraception is unsatisfactory,

Table 1. Correlation between gender and use of contraceptives

Use contraceptives	Boys		Girls		Total	
	Number	%	Number	%	Number	%
Never use contraceptives	20	15,3	111	84,7	131	15,6
Occasionally use contraceptives	20	13,8	125	86,2	145	17,2
Constantly use contraceptives	63	11,2	501	88,8	564	67,2
Total	103	12,2	739	87,8	842	100,0

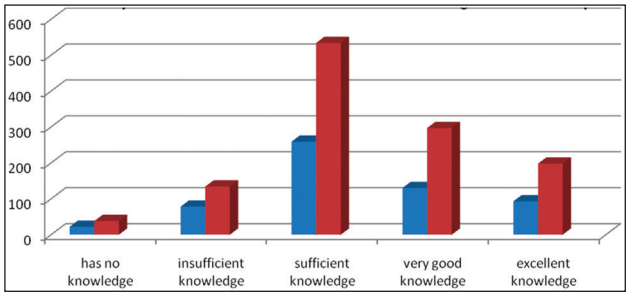
Table 2. Correlation between gender and attitudes regarding safety of used contraceptive agent

Safety of contraceptive agent use	Boys		Girls		Total	
	Number	%	Number	%	Number	%
Do not use contraception	13	8,7	137	91,3	159	17,6
Unsafe contraceptive agent	14	33,3	28	66,7	42	4, 9
Partly safe contraceptive agent	45	13,2	296	86,8	341	40,0
It is quite reliable contraceptive agent	44	13,7	276	86,3	320	37,5
Total	116	13,6	737	86,4	853	100,0

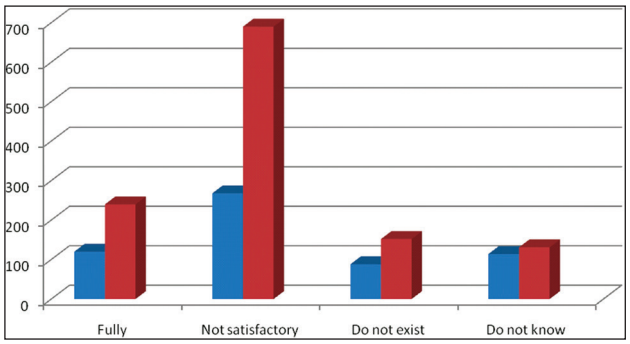
Table 3. Correlation between gender and the decision on the type of contraceptive method applied

Who makes the decision on contraceptive	Boys		Girls		Total	
	Number	%	Number	%	Number	%
Do not use contraception	19	14,0	117	86,0	136	15,9
Makes decision by himself / herself	20	13,3	130	86,7	150	17,5
Partner makes decision	9	30,0	21	70,0	30	3,5
Decision made together	68	12,6	471	87,4	539	63,0
Total	116	13,6	739	86,4	855	100,0

followed by students who believe they have great opportunity to obtain information on this subject. The least represented are students who believe that there is no information about contraception or they do not have any attitude regarding the possibilities of obtaining this kind of information.



Graph 1. Student's assessment of their own knowledge about contraception



Graph 2. Availability of information about contraception to students

Discussion

Cultural changes that have started in the last decades of the past century, and which are characterized by increasing individualization, abolition of various forms of discrimination, strengthening women's rights and the trend of sexual permissiveness, led to changes in sexual behavior of young people (10). However, global survey on attitudes and habits of young people regarding the use of various contraceptive methods, showed that there is inadequate behavior of young people, and that the relatively large number of this population do not use protection during sexual intercourse (11). This study has shown that there is unsatisfactory behavior of young people in the area of reproductive health, as confirmed by the fact that one in six respondent do not use contraceptives.

According to the international study of fertility and family, during first sexual intercourse contraception was used by 55% of young people aged 20-24 years in Poland, Hungary and Latvia. In developed countries such as France, Spain and Belgium three quarters of young people aged 20-24 used contraception during their first sexual experience (12).

Since 2009, the number of young people who engage in sexual relations with new partners without contraception has doubled in France, increased by about 40% in the U.S. and for almost one-fifth in the UK (13). The data indicate that it is essential to strengthen the programs aimed at informing and educating young people about the importance of using contraception methods, as well as possible complications that may arise due to the absence of adequate use. Also important is the selection of the appropriate ways to communicate important information to young people, particularly to marginalized and socially vulnerable ones. Studies have shown that on average only half of young people surveyed across Europe have attended sexul education in school and about three quarters in Latin America, the Asia-Pacific region and the United States. It has been shown that informing, knowledge and motivation significantly determine the sexual behavior of young people (14).

This study has shown that young people are dissatisfied with access to information related to contraception. In order to solve this problem, it is necessary to establish a permanent, local resources for information, education and promotion of reproductive health of young population and prevention of sexually transmitted infections. (14)

Conclusions

Based on the survey results it can be concluded that reproductive health of students is at risk due to an insufficient degree of responsibility in sexual behavior. Almost one in six respondents do not use any contraceptive agent, and, those who use contraceptives, evaluated them as partially safe. The decision about the type of contraceptive agent they make together with partner. They find their knowledge about contraception sufficient, but they are not satisfied with the availability of information about contraception issuess.

Informing and educating young people about reproductive health is essential to prevent many unwanted consequences of ignorance and risky

behavior. It is also the way to address problems of young generation.

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Importance of obturator bypass in the treatment of repeated anastomosis inguinalis pseudoaneurysm in terms of infection asymptomatic venous autograft

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Abstract

Presents the case of a patient who, after the primary autovein Femoro-popliteal bypass procedures, operated on 4 times because repeated ruptured anastomosis inguinalis pseudoaneurysm, always with a sterile culture and the absence of signs of infection.

Inguinal signs of infection become manifest only after the fifth episode fulminating bleeding. Apparently infected inguinal region is passed by obturator bypass procedures which excluded the possibility of further hemorrhagic dangerous complications. The patient was successfully revascularization and 12 months without any complications.

Obturator bypass procedures is the method of choice in case of repeated and unexplained bleeding from the area of inguinal vascular anastomosis or formation and disrupted anastomotic pseudoaneurysm even in cases of clinically and microbiologically unconfirmed infection.

Key words: infection, anastomosis, pseudoaneurysm, bypass

Introduction

Despite the consistent application of asepsis and antiseptic measures, improvement of surgical techniques and modern antibiotic therapy, prosthetic graft infection, which usually surgery inguinal region, and remains one of the most serious complications of modern reconstructive arterial surgery (1). Typically, the incidence of 1.5-6%, (2, 3, 4) the mortality rate 25-75% and high risk of loss extremities (2, 3.)

The significance of graft infection determines its potential complications, including severe bleeding, systemic sepsis, severe ischemia of lower extremities and septic embolisation, (5. 6) and the high prices and uncertainty over the total treatment.

In addition to the administration of systemic antibiotics, the standard treatment of infected grafts means excision infected part of the graft and radical debridement the restoration of flow in situ or extra-anatomic bypass (5, 7). Despite the growing experience in in situ reconstructions, by the cryopreserved homograft, the Autologous deep femoral vein, and antibiotic-soaked prosthetic grafts as well as their significant resistance to infection, (2, 5, 7 ,8) extra-anatomic reconstruction through uninfected area are now standard in terms of form revascularization 2 inguinal infection, since in the past, now applied obturator and lateral femoral bypass (5, 8, 9).

Although first described in 1962.3 the obturator bypass (OB) is a widely accepted at the end of the last century as a new method of extra-anatomic reconstruction in the treatment of infected femoral graft. Indications for its application in time are extended to all situations in which the femoral triangle unsuitable for implantation of arterial prostheses, including cases of infected inguinal pseudoaneurysm, radiation necrosis, repeated graft implantation, ie, extensive scarring, skin ulceration, extensive posttraumatic defects and cancer in this region (10).

We met with the patient who, after the primary autovein femoropopliteal bypass procedure, four times urgently operated on for ruptured repeated inguinal anastomotic pseudoaneurysm (GAP) is always with sterile culture and the absence of signs of infection. After the fifth episode of massive and life endanger arterial bleeding from the infected groin suspect done is iliacopopliteal obtu-

rator by-pass, which passed the inguinal region of infection, excluded the possibility of further hemorrhagic dangerous complications and provided good revascularization of the limbs.

Case Report

In our institution has received fifty year old man bleeding from the ruptured left site GAP. Two months before admission because of the extensive and infected ischemic ulceration, made the above-knee autologous femoro-popliteal by pass graft. Postoperative course was tidy with well functioning graft and accelerated healing of ulceration. Immediately upon receipt, after urgent hemostasis is done MSCT angiography, which was diagnosed rupturirana GAP 50x55 mm.

Frozen sections was found complete destruction "roof" proximal anastomosis, which after debridement meticulously reconstructed by venous patch. (Figure 1) inspection not noticed any clinical signs of infection. Seventh postoperative day, after proper rehabilitation and primary operative wound healing, the patient was discharged from the hospital. Fifteenth day after surgery, in the absence of signs of peripheral ischemia, leads to the sudden appearance of strong pain and swelling in the inguinal and femoral region creating a huge pulsing hematoma. On MSCT angiography was spotted new GAP 100x90 mm. Frozen sections was observed partial disruption welded patch lines previously set, a length of 3-4 mm, which is carefully resutured. Swabs taken from the graft, the patch and the surrounding tissue remained sterile.

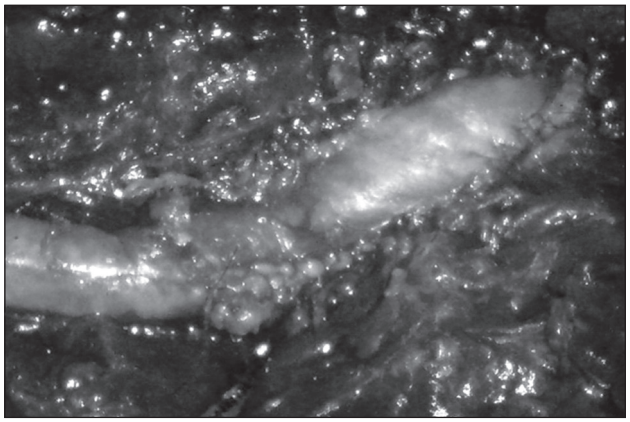

Figure 1. Destructed "roof" inguinal anastomosis reconstructed by venous "patch". Absent signs of infection.

Three weeks after the operation and proper recovery is observable initial trophic skin changes and the swelling in the inguinal and femoral region. MSCT angiography detect new GAP 110 x 85 mm. Before the surgery, the patient suddenly experienced severe pain in the thigh followed by the expansion of pulsing tumor and serious arterial bleeding through the cutaneous fistula formed.

During emergency operations, after the exclusion ruptured GAP, by pass is done with external iliac artery to the venous graft PTFE prosthesis (Figure 2). There were no signs of infection early and to take swabs remained sterile.

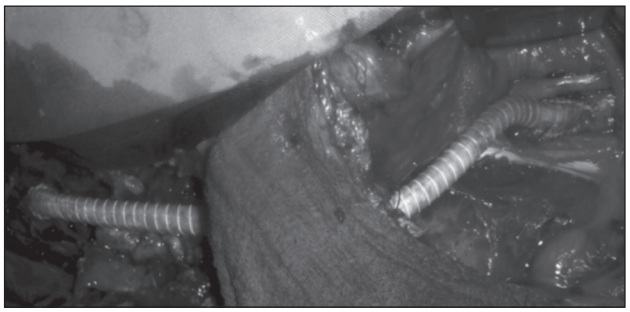

Figure 2. Exclusion ruptured GAP accompanied bypass procedure with the application of PTFE prostheses. Absent signs of infection.

Sixth postoperative day comes to a partial disruption of distal anastomosis and extensive arterial bleeding badly cicatrization and trophic changed skin. In an attempt to rescue the patent graft we cut off the neighboring segments of PTFE and autologous vein graft with interposition the same synthetic graft (Figure 3). Trophic skin changed extensively excision the reconstruction of the defect and covering the graft by bipedicular fasciocutis lobe. Wound swabs were again remained sterile.

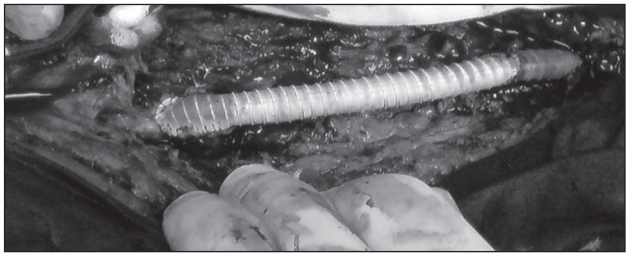

Figure 3. PTFE interposition graft after resection generous area of "composite" anastomosis

Seventh postoperative day comes to rapid reswelling of the proximal third thighs dehiscence inguinal wounds that showed signs of suspect infection. That same afternoon a new episode of the dramatic appearance of arterial bleeding. Due to the urgency of the situation and hemodynamic destabilization of patient, the graft clumped in patient bed. After recording disruption of distal (composite)anastomosis and probably inguinal infection, dropped from further attempts to rescue the existing patent graft who was take up and a patient urgently transported to the operating room.

Due to the development of severe acute ischemic legs, by transperitoneal approach is made iliaco-popliteal obturator by pass revascularization the use of ring PTFE graft diameter 8 mm. TL proximal anastomosis is created on the origin of common iliac artery and distal to the TT poplitealnoj artery above the knee. Infected graft is wholly removed with low ligatures of saphenous graft and radical debridement of inguinofemoral region.

The patient was postoperatively treated and clindamycin (Cleocin), ceftazidime and after according antibiogram report by tazocin (Piperacillin with tazobactam) fetch the next two weeks. Anticoagulant therapy was started Nadroparin and continued with warfarin. Huge inguinofemoral lesion was evident and seriously infected by pseudomonas aeruginosa (Figure 4 A). After 3 weeks of daily changing successfully covered by Tiersch's tansplantat(Figure 4 B). The patient was discharged from the hospital last month after the operation.

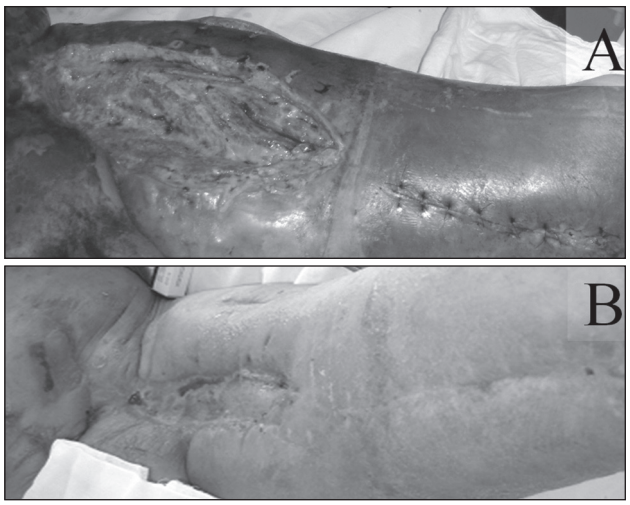

Figure 4. A. OB with spacious and open an infected groin wound 5 days after removing infected graft. B. aspect of the success of the transplant-Tiersch

Prior to discharge the patient is subjected to the control MSCT angiography, which showed clean patent implanted graft (Figure 5). Clinical and duplex scan track lasts for 12 months in any period, there were no complications, including infection, graft occlusion or formation pseudoaneurysm.

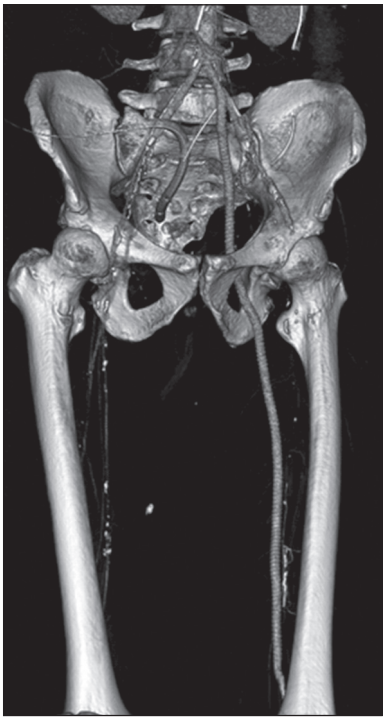

Figure 5. MSCT angiography of patent iliaco-popliteal obturator by pass

Discussion

Although the importance of arterial wall degeneration, poor operating techniques or tensions in landscape anastomosis can not ignore, the formation pseudoaneurysm is often the result of local infection.

Although the infection in peripheral vascular graft and aortic surgery rarely, with its high rate of mortality and disability and complex treatment strategies, they still represent a disappointing complication of arterial reconstructive surgery (1, 2). Drainage exudate, formation of perigraft collection, absent graft ingrowth, as well as and the appearance of clinical and laboratory signs of systemic infection clearly indicate its occurrence. Surgical treatment of infected graft is very complex and delicate and the outcome highly uncertain.

Extra anatomic choice revascularisation procedure involves axillo bifemoral

by pass, lateral by pass with descended aorta or iliac artery to the deep or superficial femoral artery and OB (1, 11, 12). Much better than lateral, OB proved to be feasible and safe procedure that provides perfusion of the lower extremities in cases of deep inguinal infection (2).

The absence of clinical, laboratory, perioperative and microbiological signs of infection, shown in the case, ordered the necessity of preservation of the patent graft during many repeated attempts to conventional care of anastomosis disruption. Mentioned lack of efficacy of procedures, manifested by the appearance of new recurrence anastomosis disruption and dangerous bleeding, could suggest that the existence of undetectable infection virulent agent.

Inability for further features in situ graft preservation and reparations as well as evidence tissue infection indicated excision infected graft and radical debridement to restore the flow of OB-om.

Unlike the lateral bypass who is infected lacune vasorum separated only fiber m.ileopsoasa, OB from infected regions better separated and isolated mass pektineal and adductor muscle, which explains the lower incidence and reinfection of new implanted prosthesis significantly better limb salvage in the OB compared to the lateral bypass (1).

Due to the needs of removal of the infected region, especially in extensive infection, more preferable performance-iliac-popliteal bypass compared iliac-femoral bypass, and is due to a greater distance adequate use of synthetic graft, of which advantage materials (13). PTFE, (14) capture the possibility of infection of these prostheses, which are remote and deeply positioned, is extremely rare and can occur in cases of extensive soft tissue infections, in what situations is justified applications autologous saphenous bypass graft.Referred cases ipsilateral, contralateral and bilateral Kim DI OB, where the reported 6 - years rate of 80% patent very encouraging (15).

Our view shows that the repeated occurrence inguinal anastomotic disruption, or GAP, despite meticulous technique of creating and absence of clinical and microbiological signs of infection should suggest the existence of covert and unrecognized graft infection virulent provocative. In such cases you should consider the need extraanatomic reconstruction in order to circumvent potentially infected region. OB is the method of choice in case of repeated and unexplained bleeding from the area inguinal vascular anastomosis or formation and disruption GAP even in cases of sterile culture and the absence of signs of infection.

In cases of recurrent (ruptured) anastomotic groin pseudoaneurysm, which can not be definitely disposed of conventional surgical procedures, even in the absence of clinical and microbiological signs of infection should be suspected on the existence of "silent" infection and access performance of extra-anatomic obturator bypass procedures.

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Bipolar disorder, suicide and vulnerable children in northeast Brazil

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Commentary

Mental disorders are clearly negative influences for development of children and adolescents, provoking in these age-groups irreversible damage for their personality and, more immediatly, for their learning capacity[1]. Bipolar affective disorder is one of most injurious psychiatric diseases, not rarely leading patient for suicide[2], and its prevalence keeps increasing worldwide, notably on low and middle-income coutries[3]. For children living in northeast Brazil, extreme social conditions constitute an environment of special vulnerability. Here we show that bipolar disorder incidence between children and adolescents in this Brazilian region increased 34.2 % from 2005 to 2010 and, in the same area and age-group, deaths provoked by self-caused injuries also became progressively greater[4,5]. In the second half of last decade, mortality due to suicide between 10 and 19 years-old achieved the maximum rate of 2.165 per 100,000 inhabitants, 20 % greater than average worldwide indices[6,7]. These trends reveal numerically the reality of social abandonment these children and adolescent face daily in their lives, even with the recent increase of population's medium income and the relatively efficient governmental assistance programs for poor families. The worldwide-known positive changes in Brazilian economy were not followed by the expected providing of adequate public policies for young people, specially in the northeast region, leaving children and adolescents in contact with stressing factors, familiar problems, violence, alcohol and drugs[8]. This combination, in addition to childhood and adolescence natural fragilities and mood flutuations made them vulnerable to development of bipolar disorder[9]. Establishment of the psychopathology and the persistence of those stressing factors is what takes them to the extreme consequence: suicide.

Mental disorders have an important repercussion over children development. In these age-groups, they can provoke irreversible injuries for their personality characteristics and, more immediately, for their learning capacity, for example[1]. Childhood and adolescence are both naturally periods of changes, doubts and mood flutuation, what makes them more susceptible for developing psychopathologies. Therefore, the attention for mental health in this age-group should be even more intense, once the symptoms of many psychiatric illnesses in these patients are different from those presented by adults[15]. In some cases, social or environmental conditions can amplify this natural susceptibility for mental health problems in children, like for young people on northeast region of Brazil.

For general population, 60% of mood disorder episodes are preceded by stressing factors, notably with social origin[10]. It is important to highlight that this combination of genetic predisposition and global psychosocial stressing factors is fundamental to deflagrate the occurrence of complete episodes of mood disorders, but do not have significant influence for provoking the subsequent manifestations[11]. Psychiatric literature cites low socioeconomic level, occurrence of stressing life events, negative cognitive style, parental negligence or hostility, minor social support, social and sexual abuses as reasons for precipitation of mood disorders in children and adolescents[12]. Most of these items are part of daily life of Brazilian northeastern children.

Brazil is the fifth world's largest country in territory extension. In the same territory, there are completely different places such as Sao Paulo and Rio de Janeiro, on southeast Brazil, strongly industrialized areas which concentrate most of nation's wealth, and areas of the northeast region, historically affected by income concentration, archaic rural economy, dry weather and principally lack of

efficient social-based governmental policies. Recently, due to important improvements on national economy, which led for an expressive increase of Brazilian families' average income, this reality became slightly different, but not less preoccupant. Instead of hunger, which put several northeast children in risk some decades ago, drugs, alcohol, urban violence, children abuse and lack of opportunities probably constitute the stressing factors relationed with this increase in the incidence of mental disorders[9,13].

Depression, abuse of alcohol, schizophrenia and bipolar disorder are, in this sequence, the four most prevalent mental disorders in low and middle-income nations, according to the a study of World Health Organization's Global Mental Health Initiative (GMHI)[14]. Table 1 abstracts some results of the cited study, exposing the differences of mental, neurologic and substance abuse diseases' prevalence between richer and poorer countries.

According to GMHI, the distribution of mental, neurological and substance-use disorders in low and middle-income countries differs from what is observed in high-income countries. Brazil, despite of being one of ten world's largest economies, has wealth concentration standards which classify it as a middle-income country to World Bank criteria, employed to stratify nations by that study[3]. Bipolar disorder, although represents just the sixth most prevalent disorder in richer countries, is the fourth in the low and middle income ones. This difference can be justified by some of the vulnerability conditions we show here, because several areas of the world face the same reality of northeast Brazil.

Bipolar affective disorder is a pathology characterized by an alternance depression and mania or hypomania phases. In the depressive phase, patient shows depressed mood, low self-esteem and considerable deficit of attention, while in the maniac phase, humor is exalted, happy or upset, and there are feelings of indestrutibility, dishinibition and increase of physical and sexual capacities[10,11]. This disorder occurs more frequently in individuals along the third decade of life and medical literature reports that first symptoms usually appear at 20 years-old[12]. But 17% of bipolar adult patients related the showing first symptoms before the age of nine[1]. Psychiatrics already classified an early-starting type of bipolar disorder, responsible for the increasing incidence of this disturb between children and adolescents. Early-starting bipolar affective disorder has some specificities when compared with the same disorder on adult patients. For example, patients present episodes of depression as the first symptom, instead of a maniac episode, making more difficult to diagnose it correctly[13].

Several pathologies can precede the development or arise along the course of bipolar disorder in children and adolescents. In this age-group, the existence of comorbidities is almost the rule, instead of a exception[1]. Attention deficit disorder, hyperactivity, anxiety, alimentary disturbs, epilepsy and substance abuse are some of most frequent comorbid diseases which turn more difficult to diagnose and to give effective treatment for bipolar patients[14,15].

According to DATASUS, the Brazilian national databank for public health information, in the last five years, we observed an increase of Bipolar Disorder incidence rates under 19 year-old of about 34.2 % in the northeast region of Brazil, while the increase for Brazilian general population was 12.4 %. If considered only patients under 10, this number is even greater, of 47.2 %[4]. Content of table 2 shows this disproportion, while comparing the advance of bipolar disorder morbidity indices nationwide and worldwide.

For some psychopathologies, suicide represents, in patients' standpoint, the ultimate way to get free from what is burdening them. This can be perceived in some studies regarding to children suicide or childhood depression. In general, patients with bipolar disorder have high risk of suicide along their lives. In the United States, for example, 10-15% of these patients are victims of suicide. 80% of bipolar patients have some kind of suicide ideation and 25-50% of them actually try to commit suicide[16]. Most of these attempts occur during childhood of adolescence[17].

Therefore, bipolar children and adolescent, opposing to what some experts thought, presents also increased risk for suicide ideation and suicide attempting, notably those who were not diagnosed and treated correctly or do not adere for treatment[19]. These suicide ideas in bipolar disorder are associated with impulsivity and upsetting, instead of depression's sadness and unconfidence.

According to recent studies, some of them showed at table 3, adolescents with bipolar disorder have about 40 times more risk for suicide than non-bipolar[19] and 20,4% of bipolar adolescents performed serious suicide attempts during a prospective five-year study[20].

Social context plays an important role in the persistence of mental disorders. Without community environments that promote physical and mental well-being, the natural susceptibilities for psychiatric problems arise and turn children in these conditions into vulnerable people[24]. Provide affordable and effective care and methods to eliminate the stigma of patients and their families, beside of avoiding social exclusion, are the proper ways to manage all mental disorders[25]. Children living in Brazil's northeast region are in a condition of extreme social disadvantage, what can be determinant for the recent and sequential increase of bipolar disorder prevalence and the mortality in this age-group due to suicide, one of possible reflections of untreated mood disorders. For protecting these children is important to identify the factors which prevent these illnesses and promote resilience for these young people. In last analysis, preventing the development of bipolar disorder is decrease future indices of mortality due to suicide in northeast Brazil.

Author's contribution

AOAR participated in the acquisition of data and revision of the commentary. MLRN and JCA determined the design, interpreted the data and drafted the manuscript. The authors read and gave final approval for the version submitted for publication.

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Contemporary models and preservation possibilities assessment in conceptual-production system of voluntary motor action

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Abstract

The aim of this paper is to describe the emergence of contemporary models of the voluntary motor action. This paper describes the best known models, and preservation assessment in conceptual-production system of voluntary motor action.

Paper is a review of available literature in the field of apraxia. Reviewing the literature we have found that the originator of modeling of conceptual -production system of voluntary motor action is Hugo Liepmann, that the dominant models of this system is Hailman's and Roy's models, and assessment instruments which are well known are Florida Apraxia Battery and Waterloo Apraxia Battery.

The impression is made that, for the future voluntary motor actions studies, it is needed to integrate comprehensive knowledge, derived from clinical studies, testing researches and improvement of conceptual-production systems models, movement researches in functional, practical and social context.

Key words: apraxia, disability, motor action

Introduction

Every human being exists and functions in different contexts. Just as physics claims that there is no body in nature free from the influence of external forces, there is no human liberated from its biological, psychological, cognitive, social, functional and other determinants used for changing and knowing the world around him.

The movement is one of the basic characteristics of humans. A child is by birth obtained with the systems needed for functioning. Most of these systems a child must master, in order to use them purposefully to establish contacts with world surrounding him. One of the basic systems that a child must master is the motor system. Combined with the cognitive and sensor system, as well as all other systems in human organism, the motor system presents the basis for creating a voluntary movement, which is determined by the overall development of man with all its determinants.

The origin and characteristics of the movement are the subject of human`s interest and research throughout history. The movements and the way of performing them are different for each individual, by which they picture his character and arouse interest of others. From observing the movement, measuring and comparing motor skills, trough movement as artistic expression, and scientific approach - a long way was journeyed.

The scientific approach to the movement research has been made in the mid of the last century. The initial primacy was given to the anatomy and mechanics of the joints. The latter studies have expanded the frames of anatomy and mechanics including more experimental model (physiology and neurophysiology) and human model (special education and rehabilitation, neuropsychology, cognitive psychology) (1). Emerging influence of natural science, contemporary technology and informatics on the medical and social sciences, has made the latest movement research more objective and more qualitative in the past decades, especially in the past few years.

Kinesiological approach describes in the best possible way the laws of movement performan-

ce in space, using the laws of physics (especially biomechanics) and medicine. Zec (2) states that the basic obstacle for rapid development of kinesiology is limited knowledge about processes occurring in central nervous system while initiating and controlling voluntary, automated and reflex actions. Hence, this area of research is still referred to as an unexplored area. The truth is that biomechanical component of human movements is today very well known, but it is only a small part of the problem needed to enlighten, the regularity needed to establish and conclusions needed to determine for understanding numerous uncertainties. That is why new studies have been orientated more towards the problems of coordinating the functions, which includes the roles of sensibility, physical activity and motor response in form of harmonious action of highly coordinated movements when changing the conditions of execution of motor tasks.

Recent studies of movement have been aimed at defining the cognitive aspects of motor behavior (planning, control and performance) in various degrees of impairment, as well as the possibilities of restitution of lost or altered movement (1) In this sense we can say that in frames of contemporary approach in studying movements the neuropsychological approach is dominant.

Apraxia as a cognitive aspect of motor functioning

Most researchers involved in studying voluntary movement from the human science aspect believe that the initiator of exploratory approach in examining conceptualization and production of voluntary motor activity is Liepmann. Liepmann explored this subject trough research of problems in praxic activity, that is trough apraxia research. Liepmann (3) stated that the term apraxia first appeared in the literature in 1871. This term had a much narrower meaning than today. More specific, it marked low recognition or inadequate use of objects by people with brain damage (3). It is believed that the creator of the term apraxia in its closest meaning it has today was Steinheil. He described apraxia as a phenomenon in which patients with brain damage occasionally lose a learned ability to perform actions (e.g. playing of a musical instrument, etc.). The meaning of the word apraxia defined by Steinheil partially coincides with the one defined by Liepmann in 1900.

The main difference is that Steinheil believes that the cause of impairment is inability to recognize the use and application of objects and tools, in other words - form of agnosia. It is not clear from his statement what is the basis of agnosia - is it impairment by nature motor, sensory or gnostic. On the other hand, Liepmann considers apraxia as a motor impairment (4).

Numerous scientists trough history have tried to define the way of making movements and to establish the problems in planning and movement performance. Wernicke uses the term "loss of the ideas of movement" and considers that there is a memory of kinesthetic sensations which are remembered by repetition and stored in the specific parts of the cortex. Nothnagel considers that "memorized images" are in the basis of the movements, and defines the "mental paralysis" as impairment in the level of "memorized images". Meynert introduces the concept of "innervation image" as a basis for creating a movement, and "motor asymbolia" as a problem that occurs at the level of movement planning. All these concepts are actually in a specific way and in a certain degree consistent with the theory of the movement patterns and motor action whose initiator was Liepmann (3).

Liepmann describes in details the case of apraxia in 48-years old patient in Berlin hospital received under the diagnosis of mix aphasia and post infarct dementia, which is to today the example of neuropsychological and neurophysiologic interpretations of these impairments. Liepmann and Mass believe that in the left hemisphere, besides the language engrams, lay also the movement patterns (Bewegungsforme in German) (5). In the literature of English-speaking areas this term is usually translated as "movement formulae". Movement patterns contain time-space images for controlling purposeful motor activity and learned motor skills. In the light of modern terminology, this term is the closest to the Heilman`s term of "visuokinaesthetic motor engrams" (6). Learning of motor skills is based on the adoption of the movement patterns and innervation schemes, through which data of movement patters are transmitted to the primary motor cortical regions. Accor-

ding to the Leipmann`s model, the performance of complex motor skills depends on the plan of motor action which defines and controls spatial-temporal sequence and combination of individual movements in complex forms of motor action (7). Motor formula, that is the pattern of movements, contains images of movement in space and time, or spatial-temporal sequences. These images, that is sequences, actually represent general knowledge of the action plan which is to be performed. This knowledge is by nature sensory, most often visual but it can be presented in other sensory modalities when it is necessary for the specific action. Leipmann claims that innervation schemes are established trough exercise and provide efficiency in transformation of motor formula, that is movement pattern, fully and precisely in innervation which enables proper limbs positioning in accordance with the idea of the movement performance direction. Another significant factor is kinetic memory that includes a functional link between the innervation acting via "shortcuts" without innervation of visual images and orientation (8).

When a person with a form of brain impairment cannot perform movements as an adequate response to verbal instruction, causes may be different (8), specifically: palsy or paresis (part of the body that a person should use for a movement performance may be paralyzed or to some extent paretic that the movement is impossible to perform); ataxia (part of the body is strong enough to perform a movement, but the ataxia as a consequence of losing sensory determinants needed for movement coordination makes the movement impossible. The person misses target, or violent, uneconomical, uncontrolled movements occur. The person often drops the objects out of the hands, which is a consequence of uneven force deployment during the movement performance, as well as the insufficient muscle and muscle group cooperation included in motion (dysmetria, asynergia). Cooperation amongst muscles (synergy, which mainly occurs at the unconscious level, in this case is absent); tremor, chorea, athetosis and similar disorders (may be disturbing factors in the movement performance); word deafness (presents the agnosia in the acustics. For example, because of the misunderstanding of the language (sensory aphasia), a person cannot understand the order and therefore performs a particular aspect or aspects of the movement incorrectly); optical or tactical agnosia (when a person cannot recognize objects or tools and uses them in a wrong manner. For example, a person uses scissors like a pen, because he/she cannot recognize the object due to so-called "physical blindness", which is often paired with tactile amnesia - inability to recognize by touch); mental processes vulnerability (a large decrease of all mental processes can be noticed (dementia), meaning that abilities to observe, differentiate, understand and mentally process are decreased, which leads to reduction of motor skills. The role of mental processes in movement performance is often ignored).

It is more than often that persons with brain impairments show none of the mentioned symptoms, yet a possibility of adequate movement performance is decreased or disabled. There could be some presence of the symptoms, but not enough to explain inadequate movement performance. For example, a person with ataxia uses spoon as a cigarette. Inadequate use of objects cannot be attributed to ataxia; in this case apraxia is present.

In movement impairments such as palsy, paresis, ataxia or tremor, athetosis and other, the basis are impairments within the systems which humans are born with, like - above others - central nervous system. The functions affected are, e.g. equilibrium in the locomotor system while walking or standing. Praxia, on the other hand, involves actions that are learned from experience and by exercising.

The fact is that a child in certain way learns to keep coordination and balance while walking, but this type of learning is in many ways different than learning a language or a meaningful movement. Maturation of the medulla after the birth plays a significant role in acquiring these skills. In adopting basic motor skills the important process is taking over control of the functions given by birth. Coordination of existing functions is established by trials, and in time it becomes incorporated in the movement by which it becomes fully developed. In this way the developed movement takes nothing from the social environment. It implies learning proper use of centrifugal impulses on its own centripetal impressions, according to the principle of least effort, that is, it presents control of its own motor skills (8).

On the other hand, learning of meaningful movement in order to achieve person`s needs and to

establish social contact, which includes the manipulation of objects, using words, gestures, is in the domain of praxic activities.

Apraxia is defined as an impairment of learned movements, which is not caused by muscle and/or neurological factors (e.g, weakness, akinesia, aphasia, cognitive decline resources, vision problems, etc.) (9, 10, 11).

According to the International Classification of Functioning, Disability and Health (ICF), World Health Organization (WHO), apraxia is classified as b176 Category. This category is named "Mental function of sequencing complex movements" and includes ideational, ideomotor, oculomotor apraxia, dressing apraxia and apraxia of speech, and excludes categories of impairments of psychomotor functions (b147), higher cognitive functions (b164), and whole 7th chapter in ICF in which neuromuscular impairments, skeletal function related to movement performance are categorized (12)

Within this classification different categories of apraxia are listed, which are defined in detail in numerous and various researches. One of the most common approaches in assessing apraxia trough history is assessing the quality of pantomime or imitation of gestures. The quality of pantomime is usually assessed by giving an order to the respondent such as: "Show me how to...". The respondent would perform the movement, after which the examiner would assess the quality of the motion. For assessment of the imitation of gestures, the examiner would use the order: "Do this…" after which the examiner would perform the movement that the responded needs to imitate (13). Studies that have used this method of assessment of apraxia, according to Benke (14), led to defining two different forms of apraxia: ideomotor and ideational apraxia. These two forms of apraxia in fact differ in patterns of errors that occur during the movement imitation and pantomime (15). For ideomotor apraxia it is typical that spatial orientation, selection and movement sequencing is damaged, in the imitation of movement and in pantomime as well (13). These errors are according to Benke (14) the most evident in imitation of purposeless movements. Ideomotor apraxia is caused by impairments in selection and combination of individual, natural movements from which the complex motor activity is organized. The movement is clumsily performed, with individual movements that are placed in space and time in a wrong manner (e.g. while performing military salute the hand is placed behind the ear). The patient is aware of his mistake and tries to correct it, which testifies that the representation of the gesture is preserved but it is clumsily performed, and one of its components is wrongly selected or placed in spatial and/or temporal terms (7). On the other hand, ideational apraxia is in its basis conceptual and related to the use of tools and objects. In this type of apraxia the movement imitation is intact, while pantomime is performed with errors, which means that the semantic component of the movement is compromised. Ocic (7) states that the ideational apraxia represents the impairment in recalling the general scheme of movements caused by loss of motor engrams or their difficult access to semantic memory in which information about basic features of objects and their usage are stored.

Contemporary models of conceptual-production system of voluntary motor action

These researches have not only recognized and defined different forms of apraxia, but have also established general attitude of scientist that in the basis of voluntary motor actions lays complex system. When impairment occurs in some element or more elements of this system, different clinical features could be made. Also, there are certain differences in defining same forms of apraxia by different researchers. Therefore, the contemporary researches are more and more based on defining elements and creating adequate models of conceptual-production system of voluntary motor action.

Coltheart (16) states that simultaneous explanation of normal and neuropsychological abnormal processing of information is not of recent date. This approach is typical for work of recognized neurologists from the late nineteenth and early twentieth century like Wernicke, Lichtheim and Leipmann, that Head (17) depicted as the "diagram makers." Designing diagrams refers to the creation of the first movement's scheme theories and a motor action plan, as well as a model of praxic activity.

We have previously mentioned Leipmann`s model of praxic activities which was a starting point for creation of contemporary models of conceptual-production system of voluntary mo-

tor action. In foreign literature the two models are defined as dominant in contemporary researches: Heilman`s and Roy`s. Both models are composed of similar components, but their modeling by levels is different in many ways. Rothi, Ochipa and Heilman have developed a model with the aim of better understanding praxia and apraxia which is today known as Heilman`s model. This model is based on the belief that motor impairments such as apraxia are similar to those which develop in speech-language system after specific brain injuries. It is assumed that a certain pattern of dysfunctions developed in persons with apraxia could occur exclusively as a result of impairments in more than one system, and that these impairments patterns are conceptually similar to those which develop in the speech-language sphere (18, 19).

Heilman`s model (Figure 1.) includes an analysis of sensory information (auditory and visual analysis), the existence of internal knowledge (object recognition, phonological, vocabulary and verbal actions, which are all connected and operated through the semantic and action system) and the generation and control of gestures (interval schemes and motor systems) (13). It is important to emphasize that Heilman`s group defines lexicon as "the memory of movement or visuokinaesthetic motor engrams", and semantics as the "conceptual knowledge" (20).

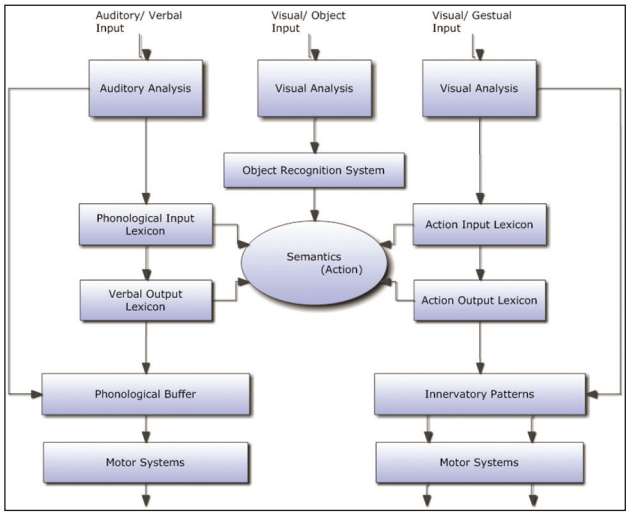

Figure 1. Rothi, Ochipa and Hailman's 1991 version of a cognitive neuropsychological model of limb praxis

The second dominant model in contemporary researches is the one developed by Roy and Square (11), based on the impairment analysis in motor action sphere, enabling a comprehensive approach to this topic. The authors believe that the impairments in the motor action sphere are multimodal. The Roy`s model (Figure 2.) includes sensory and motor skills brain impairments, but also impairments of some cognitive systems, like working memory. Unlike Heilman`s model, Roy`s clearly identifies sensory / perceptual system, a conceptual system and a production system. The assessment of preservation of these systems is based on the pantomime, imitation and postponed imitation of movement analysis. Sensory and conceptual systems are also assessed. Relating to the ability assessment, Roy defines eight patterns of performances. When a person is unable to perform gesture recognition, tools and objects and inadequately performs pantomime, while imitation and postponed imitation of movement are preserved, this pattern is attributed to impairment of the conceptual system. When it comes to the impairment of the production system, the ability of gesture, tools and objects recognition is preserved, while a person achieves poor results performing pantomime and/or imitation and/or postponed imitation (21). There is a possibility that both conceptual and production system may be damaged, which means that a person shows inadequate results performing all tasks. From eight error patterns, one defines impairment of the conceptual system; six define impairments in the production system, while one defines impairment of both systems.

Preservation assessment possibilities in conceptual-production system of voluntary motor action

Both models estimate the errors in performing different tasks; however Roy`s and Heilman`s model differ in many ways, both in components examined, and in constructed instruments for assessing performances. Both groups have developed instruments for assessing performances. Heilman`s group had designed (22) Florida Apraxia Battery (FAB), while Roy`s group had constructed Waterloo Apraxia Battery (WatAB). Scott (13) provided a parallel review of these two batteries of tests and concluded that the battery designed by Roy`s group contained more elements and examined more different types of movements.

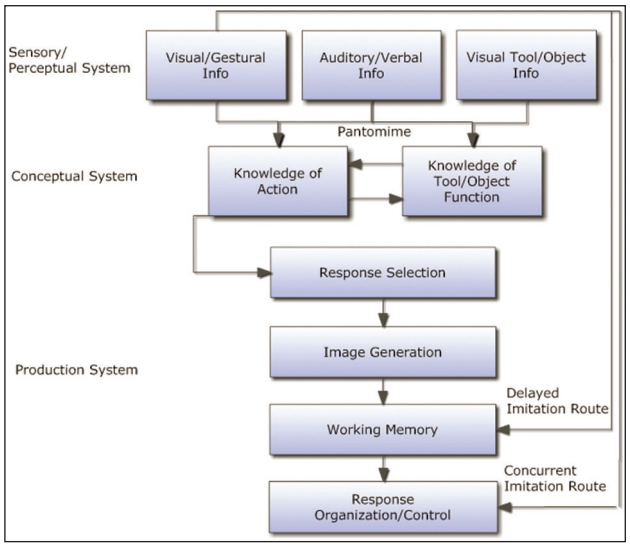

Figure 2. The Conceptual Production Model of Apraxia Roy (1996)

Speaking of performance assessment, both batteries similarly assess the achievements in sensory/perceptual tasks, as well as conceptual system, that is internal knowledge about tools, objects, gestures recognition and similar. When it comes to movement performance, the assessment instruments are different. Heilman`s group estimates movement in more descriptive manner. The authors define five categories of errors, namely: content errors (perseveration, relational, non-relational, errors while using hands), temporal (sequencing, timing, appearance), spatial (amplitude, internal configuration, using body parts as objects, external configuration, spatial movements), other (concretization, response impossibility, unrecognizable response). Each of these errors contains a description of the error (23, 24). In local author`s research (1, 25, 26, 27, 28) errors are defined in a similar manner.

On the other hand, Roy`s group describes errors using kinesiological knowledge. When performing a movement, the presence of location errors is estimated, as well as hand posture, action, movement plane, orientation. Kinesiological findings in the evaluation are applied in a descriptive manner.

The theoretical and practical importance of praxia assessment is under question. Researches in this field have great clinical importance. Clinical-anatomical studies, which are in the same time the most present, speak in favor of apraxia as a cognitive-motor syndrome which influences both body parts and is mostly developed in left parieto-frontal impairments. It often develops as a consequence of stroke, with the damage in left hemisphere or in neurodegenerative disorders with the impairments in parietal lobe (Alzheimer's disease, corticobasal degeneration). Studies in other populations are almost nonexistent. Apraxia is a major cause of disability in patients with brain damage after stroke, and significantly affects daily lives of people, predicting the dependence on someone else's care. Clinical studies have enormous significance for Restorative Neurology (29).

Schwartz & Buxbaum (30) suggest that development of impairments in gesture performance and movement imitation does not mean that the problems in everyday life will occur. Because of the reasons described, the authors recommend that the praxia assessment is conducted through natural action (Naturalistic Action), using real objects and tools. Rare are the studies that examine the impact of quality of praxic activities on everyday life. Research results of some authors (31), which were conducted on a sample of 33 patients after a stroke in the left hemisphere, speak in favor of the importance of rehabilitation in limb apraxia and its impact on improvement of daily patient`s activities. In this research authors do not emphasize the importance of the apraxia assessment instruments description, nor describe in detail the elements of the treatment itself. Although it is quite clear that this research does not provide enough information, it is rear in this type of researches and opens new issues in terms of praxia relation to everyday life activities.

Buksbaum et al. (32) provide an overview of current apraxia treatments, indicating that development of apraxia treatments is in the early stage, and that most researches are based solely on case studies. Further development of a clear approach and treatments paradigm are necessary.

Other current researches are based on the development of new assessment methods (33, 34), as well as on the testing of the conceptual-production system models (35, 36) in voluntary motor actions, analyzing praxic abilities from kinematic aspect (37, 38).

Conclusion

The impression is made that, for the future voluntary motor action studies, it is needed to integrate comprehensive knowledge, derived from clinical studies, testing researches and improvement of conceptual-production system models, movement researches in functional, practical and social context. Overview of the most important concepts and review of the research praxic activities, as well as the integration of these findings will provide a basis for the quality research design.

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Medical expertise in criminal procedure De lege lata et de lege ferenda

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Abstract

Introduction/Aim. In a criminal procedure, to determine or evaluate facts, court uses its conclusions and presentation of evidence, frequently with the professional help of experts of different profiles. An example of obligatory expertise is medical expertise. The aim of this study was to determine (ascertain) what is the existant state related to this issue, how much the order of expert testimony affects the results of expertise, is it possible to affect existant state with continuing education, what is the situation related to current legislative reform, should there be any changes in the relationship between the participants in the criminal procedure and medical expert towards the prooving action. Through positivelegal, comparative and doctrinal approach the existant state and suggested changes are discussed.

Results. In the study, special attention is paid to procesual flow of expertise and basic conditions and skills for expertise. The need to include vocational medical societies on the register of the list of experts is highlighted. Problems in the work of medical experts are more related to the work of authorities involved in the procedure, than to the experts themselves. There is an obvious dispute between the authorities of court and medical experts. The value of expert's findings, opinion and testimony are a separate chapter.

Conclusion. State *de lege lata* is not changed much with *de lege ferenda* in a draft bill of future CCP in connection to problems mentioned in the study.

Key words: expertise, prooving action, order of expert testimony, principles of penal law and medical science, evaluation of medical expert's testimony, finding and opinion.

Introduction

In democratic societies, penal law is based on balancing two opposite interests – enabling the protection of society from crime and the protection of individuals from ungrounded conviction. This balance is already stated in the Constitution of the Republic of Serbia and it is further elaborated on through the regulations *habeas corpus acta* – Code of Criminal Procedure (CCP). The court and all the authorities that are involved in a criminal procedure are expected to objectively, respecting public policy and human rights of the defendant and the damaged, conduct the procedure of seeking and establishing of truth. In a criminal procedure, there are a great number of legal and factual questions that have to be answered in order to regularly and truthfully determine all the circumstances relevant for the establishment of factual state and reaching legal verdict. During a procedure of establishing and judging facts, court, for some of them, uses its own point of view and for the others, presents proof.

These days, forensic expertise is almost inevitable activity. Material condition, which determines, is also a factual issue of which are the important facts related to the criminal act and the state of facts in the criminal procedure. At this point, because the court frequently relies on other sciences and areas in which it lacks skills or expertise, it demands exterior expertise. With the development of science and technology, room for answers to factual questions is expanding. The court is receiving professional help from court experts, different profiles of *specialists* (experienced, skillful, reliable), and often it is necessary to conduct multiple investigations by experts of different profiles.

The use of personal, professional, as well as qualified, extralegal knowledge is not allowed to be used by a judge involved in the procedure, so

that such a fact would remain undetermined.[1] This legal limitation of our penal law is different from the solution of criminal procedural law of e.g. the Republic of Germany where judges with specific knowledge and skills can give an expert opinion in their own court cases, heading towards the suggestion of refusing the motion for hearing of expert if the court disposes such skills in the specific area. (article 244, (IV), StPO – German CCP).[2] The limitations in our law do not release the participants in the procedure from the obligation to constantly improve in various fields, including regulations and rules about expertise. Without those specific pieces of knowledge and skills, they will hardly be able to adequately absorb forensic improvement during the process and through the results of a criminal procedure in order to reach right and legal verdict.[3]

When making decisions during criminal procedures in which specialized scientific and professional knowledge is requested, competence or qualification, the judge, before the expertise, should know so much about the case and methods for the expertise in question as to be able to make an order for expert testimony, as a formal prerequisite to giving an expert opinion – based on this, it is easy to conclude about the problem that lies ahead of an expert. Otherwise, based on a typical order for expert testimony by the authority who investigates, we get finding (*visum repertum*, *kunstbefund, rapport*) and opinion (*parere*, *kunsturteil, avis*) based on the sense of an expert who himself has to, relying to his own experience, decide which are the questions that have to be answered by the experts. In a finding, an expert has to provide a list of determined facts with a detailed description, and in the opinion section, he comes to conclusions which are answers (*sic*) to the asked questions. From time to time, a medical expert is asked to provide a finding or just to give an opinion. For example, if some kind of treatment, applied by a doctor who is suspected of negligent treatment, is common by rules of medical science, and accordingly an adequate treatment in the given case.

If there is no proper order for expert testimony, it frequently results in supplements, repetitions and new expertise, even repeated trials, which are not to the interest of the principles of legality and fairness of the procedure. This way of doing expertise, caused by insufficiently professional set of the assignment of expertise, often causes (unjustified) revolt by some of the parties in the procedure and it is directed towards the expert blaming it on his incompetence and partiality, which generally cannot be accepted as truthfully.

On the other hand, no matter how precisely and skillfully the order for expert testimony was made, it is hard to get the right result unless the expert, except formally, does not possess knowledge and skills to accomplish the given task.

Code of Criminal Procedure determines procedural conditions for the conduct of expertise and it is realized by the rules of profession and science. In each particular case, the expertise itself is always determined on the basis of the judgement by the authority involved in the process. Still, CCP cases in particular explicitly prescribe expertise, meaning the existence of certain facts can be determined only on the bases of expert opinion. Besides those cases, expertise is prescribed when it is necessary for determination or clarification of important facts that could not be fully determined in any other way.

One of the most frequently prescribed mandatory expertises in the criminal procedure is medical expertise – *expertisis medicoforensis*.[4] Penal law, based on positive legislations, implies, as a rule, only medical expertise in the process.

Before a criminal procedure, it is possible to conduct a single paramedical expertise – i.e. issuing paramedical documentation – which, for a patient, is the only form of medical expertise conducted within medical care of citizens. It involves a doctor's assurance and a medical board's report, issued exclusively at the patient's request. If those documents were available to third parties, it would lead to violations of medical secrets. Certain authors consider patients to be the only rightful persons to request such expertise.[5]

Before a criminal procedure begins, in the case of grounded suspicion that in a particular case there was a criminal activity, it is apparent that the Attorney General has the right to request issuing paramedical certificate (based on CCP and Law on Public Prosecution). He has the right to imperatively request a medical certificate, cost free, based on the insights in the medical protocols, i.e. medical file about ascertained medical condition of the patient with the diagnose given in volk's language and

Latin. That is the point where one can notice the need for basic knowledge of doctors and Bachelor of Laws in the field of medical law and forensic meaning of medical documentation (which represents the basis for an analysis of medical science overall, especially for forensic medical expertise). The activity of proving by expertise from poorly conducted or irregularly issued medical documentation is difficult or impossible, making the authority being withheld for this evidence.[6]

De lege lata, in the existent CCP, when it comes to the procedure of expertise:

1. Expertise of deprivation of life, where examination and autopsy of corpse are separated (article 124 – 126), examination and autopsy of an unborn child and a newborn (article 127) and the expertise of poisoning;
2. Expertise of body injuries (article 129) and,
3. Expertise of frame of mind (article 130).

De lega ferenda is similarly determined – in a draft bill of future CCP[7], stand-out points include

1. Expertise of body injuries (article 127 – 128),
2. Expertise of corp (article (129 – 130),
3. Psychiatric expertise and physical examination of the accused (article 131 – 132).

Qualitativly speaking, changing *de lege ferenda* is related to the process flow and the process of expertise, as well as the position of an expert and his opinion when he is hired by the parties and not by the authorities. The current state should be changed. Real results of the suggested changes related to the expertise as an activity of proving overall, including medical expertise in the criminal procedure, will depend on multiple factors. Primarily, on the engagement of the authority of the criminal proceedings on the one hand and medical experts on the other hand, on the change of thus far overall relationship towards this proven action, but also towards expanding knowledge reated to legal medicine.

The aim of this work is, through analysis of the current state related to expertise, with a review of novelties, to give a suggestion for the improvement of these solutions. Methods of analysis of doctrinal and legal solutions is used, along with the study of jurisdiction – Supreme Court of Cassation, Court of Appeals and supreme court on the territory of the Republic of Serbia. Some of the changes were not elaborated on in detail because, more or less, they are not related directly to medical expertise but more to procedural control of the process, including norms pertaining to the exemption of the expert and his oath.

Process flow of expertise

When the decision is made about determining expertise (article 113 and 114 of draft CCP), the authority conducting the procedure (whether it is an Attorney General or the court, and exceptionally law enforcement authority) submits written order for expert testimony which consists facts related to the expertise and to whom it is delegated. If there is a danger of postponing the expertise, one can, with the obligation of composing an official note, orally request it (article 117, paragraph 1 draft CCP). The order for expert testimony should determine the direction of the expertise with the most accurately possible facts and circumctances needed to be clarified, to determine the deadline and the framework of the expertise.

Omissions related to formal goods, but contentless command, come from the fact that frequently, only the expertise of the cause of death – imputability *tempore criminis*, the mechanism of formation of ascertained body injuries and similar – is requested, without getting into the inner side of the expertise. The aim of expertise is vaguely determined, which indirectly enables the expert to enter the jurisdiction of the authority who alloted him. It is usually expressed as a request to clarify all the circumstances of a particular case, and based on that, to submit finding and opinion, treating the rules of the profession and science. Specifying the task of the expertise cannot be schematized, which is often way of doing *an Mustern*. That way, the authority of the process has only been part organizational, but does not merit part of the expertise. It causes dillemas with the experts and a realization of the task, which extends time to get answers to all the factual questions. All of this slows down the process, and the work is more expensive and factual questions become more complex. That does not make finding the solution to legal issues and qualifications any easier.

Giving concrete questions to the expert and setting the task of expertise through an order for expert testimony, an authority conducting the pro-

cedure shows how much he does (not) understand the very nature of the chosen vocation of expertise. It would be useful to have consultants on the side of the authorities in order to set the task of the expert as quality as possible, and before that, determining profile – the specialty of an expert. By setting a specific goal in the order for expert testimony of expertise, one gets equally specific answers, and vice versa. Such a solution is not provided in the CCP draft and it is up to the court and prosecution to deal with it through personal contacts and other informal ways, and not through provisions and institutional framework. Real participation of the expert helping court, before one is even determined, contracts elementary principles of criminal procedure, from the principle of contradiction on.

A draft of the new CCP specifies the content of an order for expert testimony (article 118 – Order for expert testimony of expertise) and adds a warning that facts collected by an expert during an expertise are secret, as well as consequences of giving false report and opinion. Up until now, issues order for expert testimony of expertise were delievered to the parties involved in the process and to an expert. However, it seems now more active participation of the parties could be expected, while suggesting the authority broadly consider certain questions, and some unquestionable, not be given an expert opinion. These suggestions should be put in place after issuing an order for expert testimony and before giving an expert opinion. Even though this has been an option, the lack of it shows that its standardization might result in achieving the goal.

The practice of so-called control expertise that was conducted by a defence and/or damaged as a prosecutor is now considered as a legal possibility of hiring, by power of attorney, a counselor (article 125, draft CCP) when an authority conducting the procedure determines expertise. A counselor has a role of an expert, hired by parties, assigned to provide professional and opportune help, forbidden to abuse his rights in the process. Counselors have all the rights assigned to experts, and before court enquiry, they take oath (article 126 draft CCO – Rights and Duties of Expert Advisors). Expert advisors could be invovled at the above-mentioned moment of delivering order for expert testimony of expertise, after it is delivered to the parties involved in the process. It is noticeable that up until now, the control role of an expert advisor was raised to significantly higher level in comparison to the current state, and the advisor's responsibility in executing some role given by a party was more potentiated.

This way efficiency and economy in the court treatment could be raised, because, mainly, the demand to determine supplementary, additional, repeated or new expertises would be fulfilled.

Basic conditions and skills for expertise

During the time of the Roman Empire, in situations when the cause of death of a citizen was disputable, the practice was, at the square *Forum Romanum,* to leave corps, and people with knowledge in the field of treating people would help determine the cause of death. These were the first recorded cases of professional medical expertise in a process conducted by a determined arbitrator. Considering that at *forensis* (square, public) it was judged, *forum* metaphorically means court, i.e. judicial.

Contemporary *expertus medicoforensis* is an entity that possesses necessary professional knowledge and practical experience; with appropriate medical education and at least five years of work experience; necessary to determine or judge some important facts in criminal procedure.[8]

Essential material conditions for an expert, whether it is natural or legal person, are determined by Law in a court of expert witnesses (article 6 – 10). Knowledge and experience for a certain area of expertise are proven by published professional or scientific works, participating professional counselling, as well as by opinions of vocational organizations or recommendations of court where the expert used to work or did professional work.

Given that worthiness for the execution of the job of an expert is included, it leads to many doubts about the registration in The Register of Experts that is conducted (and keeps the Register) by the Ministry of Justice, since it is an undefined term. A much better solution would be to accept, after the determination of the existant formal conditions, as an obligatory opinion of the vocation – vocational societies *e. g*. Serbian Medical Society (SMS), and that appellate body is competent (administrative) court.

According to the opinion of court medicine experts[9] at the Faculty of Medicine in Novi Sad,

there are three vital conditions for every medical expert. These include having high levels of ethics and professional morale, professional knowledge and knowing basic principles of expertise in the criminal procedure, legal aspects of the CCP and Criminal Code (CC) and basic legal terms like criminal intent, negligence, case, institute *in dubio pro reo* and others. Knowledge about principles and institutions is not acquired only through work, gained experience or studying court medicine, but also through studying the relation between law and medicine, as the newest separate scientific discipline – medical law. This additional condition is not mentioned in the Law on Court Expert witnesses, and the practice of our courts shows the need of court experts for that additional knowledge. The problem, which court practice usually does not recognize in procedure and appeal, and *vice versa*, is that participants in the process need this kind of knowledge, and also, it means the least to the judges and Attorney General (as well as to advocates, at least to those determined the line of duty). It is about a minimal level of knowledge based on what they could rightfully set an assignment to an expert, and afterward to legally and rightfully judge in the procedure of estimating evidence.

Particular authors, even legislations, negate that all doctors who fulfill formal and material conditions can be medical experts in court, finding the base of their antagonism in their place of work (specifically military doctor). They justify their opinion by strict hierarchy and chain of commandment that is present in military institutions, which can lead to dependence when giving findings and opinions.[iv] We find that such an attitude is completely unaccaptable, and experience in the practice of the Special Department of the High (earlier known as District) Court in Belgrade and its War Crimes Chamber, as well as other courts in the Republic of Serbia say the opposite about the expertise conducted by specialists of one of the highly recognized referential medical institutions - Military Medical Academy (MMA). The same has been said in cases from our recent past and felonies done in the territory of former SFRY at the time of the disintegration of the state.

Criminal Code Law (CCL) determines the order of allocation of experts inasmuch the case is given to legal persons – professional institutions or state authorities, and only then to physical persons that are court experts (article 114 CCP). In the court treatment of the Republic of Serbia, it is noticeable that individual experts are allocated less complex cases while institutions and teams of experts are allocated when it comes to more complex expertises.

Related to hitherto regulations, Law on Court Expert Witnesses and the CCP draft will include a possibility – if there are legal or factual reasons that prevent experts from the Republic of Serbia to give an expert opinion, the expertise can be allocated to an expert or an institution from abroad. Up to now, such situations have been dealt with more by consensus than through legal regulations.

That solution should affect the acceleration of criminal procedure, especially in procedures due to criminal acts against public health, in which the defendants are doctors, and medical expertise lasts longer than expected.[10] Studying practices of Criminal Division in courts shows that latency of giving an expert opinion and findings are one of the most common causes of procrastination of criminal procedure.

Duty of the expert

Today, experts do not go to Forum Romanum to give an expert opinion, but, whenever it is possible, it is conducted in a building of court, and if not, in some other appropriate place or in an institution for experts. An expert has an obligation to respond to an order for expert testimony, to carefully consider the subject of expertise, to list all the observations and to give a finding and opinion. In regular criminal procedures, it is not a legislator who determines the deadline for submitting finding and opinion, but the authority, depending on the complexity of the subject being examined and the assigned task. Only in the procedures for the criminal act of organized crime, corruption and other serious criminal acts, the deadline is determined by the state – up to 90 days. For latency of giving an expert opinion or for exceeding deadlines by an expert, a fine is anticipated. However, in practice, it is rarely conducted. Experts justify themselves by a huge number of subjects in the process and it is definite that the issue is contributed by disorderly execution of financial obligations of the state toward them. The solution

to this problem can be found out of the process – financial obligations should be executed regularly and a number of experts should be registered for the areas from which they are missing. In the sense of process, the CCP draft still lacks some more practical solutions to this problem. Namely, if an expert "objectively" cannot conduct delegated obligation in time, he should inform the court up to a certain deadline. Beside the notice of why he cannot finish the testimony in time, he should list all the conducted activities and the deadline up to when he would be able to finish the expertise. Hitherto, court tolerance of these latencies have been undoubtedly a breach of law by the defendant to judges within a reasonable time limit, and it is the responsibility of the state to provide an allowance because of the breach. The solution would be, apart from the court duty (article 14, paragraph 1 draft CCP and article 16 paragraph 1 CCP), to conduct the procedure without procrastination and without enabling the slightest possibility for any further procrastination. This could be done by standardizing the determination of a new expertise, by a different expert or institution for expertise, and implementing strict regulations concerning fines.

Medical experts are under an oath in two ways: they have humane profession that is directed toward a patient and his treatment, and they are medical *ad hoc,* or permanent court experts. This is necessary so that treating people could be seperated from medical expertise in a court procedure and so doctors of medicine and medical sciences are protected from possible abuse of court or any parties in the procedure. That way this legal-moral obligation forces them to stick to the given task by an order of court, law and their oath.

Problems in the work and the jurisdiction of medical experts

The evaluation of the evidence provided by medical expertise often further complicates a possible conflict on the relation of jurisdiction of court and an expert and the division between them. Theoretically speaking, there are both professional and process jurisdiction of an expert. We can discuss one's professional and scientific knowledge based on their professional competence and gained experience, while process jurisdiction of an expert is often a question mark. It all starts with badly constipated order with the general clause "to consider all the circumstances related to the critical event," when an expert (realistically) independently determines the framework of the expertise and a circle of questions that he needs to answer, all the way to an independent collection of the material for expertise, sometimes going beyond the scope of his profession and going into other related disciplines. This will somewhat be dealt with by additional education of participants in the procedure, including court, prosecution and experts.

The real problem of conflict of jurisdiction is when the authority conducting the procedure and a medical expert appear and find certain questions to be factual instead of legal. It is the same situation when the authority conducting the procedure asks the same from an expert, to give an opinion on legal matters.

When it comes to expertise of body injuries, there are many conflicts, even among medical experts: if there was and what kind of serious wound there was depends on the way of thinking of the medical (doctor) expert (even court medicine expert) and medical rules for diagnosis of therapy. That is why the interpretation of the legislative provisions from the Criminal Code of assaults should be provided by the court and not by an expert, because a doctor is torn between two principles: a medical principle *in dubio pro terapia fortiore* and a legal principle *in dubio pro reo*. That is also why a medical expert and court should understand the meaning of both institutes.

It is the same situation when seeking causality, because medical expertise covers only one part of the causal relationship, which, as a rule, is not enough to judge legal causality. Both the court and an expert need findings about causality in philosophical-gnoseological sense, and not just individual findings about medical and/or criminal-legal causality.

After examining these issues, any question that remains unanswered can be related to all the criminal activities – it refers to guilt as a legal term with medical-psychiatric elements. Determining mental capacity, incapacity or substanitially diminished capacity, in a case of negligence, all *tempore criminis*, are exclusively legal issues that are met by a court, and its decision is based on medi-

cal expertise. Based on the findings and opinion of a medical expert, whether an individual or a team, if the accused was in some biopathological state listed in Criminal law, the court deals with these issues.

The value of findings, opinion and testimony by an expert

Legal assumption, *presumptio iuris non tantum*, that *iura novit curia* is valid as much as the assumption that a court does not have enough professional knowledge in a medical field which is why the court ordered expertise. With the list of situations when it is regulated by law that specific medical expertise is obligatory, one might come to conclusion that medical expert's opinion is an exception from the principle of free assessment of evidence and that a court is limited by that testimony and the findings of medical expertise.

This attitude, due to legislative and doctrinal reasons, even though it is particularly delicate task in medical expertise, is unaccpetable. The case evaluation of findings, opinion and testimony by a medical expert is followed by his evaluation of other evidence, and afterwards a court comes to certain conclusions and forms its opinion. However, it is a fact that the evaluation of a medical expert is usually uncritically – accpeted by a court. This malady related to expetise concerns the overall case law of continental law of criminal procedural law, and not only in our country. It is very difficult for a court to disagree with a medical expert and to logically explain its stand without some additional help.

In Anglo-Saxon law, both case law and doctrine pay special attention to the evaluation of this evidence and to medical expertise. With a different concept of a criminal procedure, there is a qualitatively different approach to medical expertise. A court is requested to, in the evaluation of expert's testimony, finding and opinion, to search for answers to a couple of key questions, some of them being questions (set thesis, hypothesis and alternative hypothesis) related to the possibility of expertise, others to credibility of expert's testimony.[11] In this system, a court evaluates authenticity of the objects of expertise, if, during the expertise, were taken into consideration only those elements related to commiting criminal act, and all that is specified in the order for expertise. If a mistake is made at the beginning, it definitely affects the quality of evaluation of expertise material and objects of expertise.

Condition *de lege lata* related to expertise, especially medical expertise, is not changed much with suggested interventions *de lege ferenda* and draft CCP and the Law on court experts, at least when it comes to problems that were highlighted in this paper. Where more fields should be included, when deciding about registering in the the Register of Experts, final decision is made by executive athority and where the quality of process organisation of medical expertise should be higher and there is a lack of solutions for newer cases, nothing changed.

Additional requestioning of organisation of medical expertise, introduction of obligatory forensic education and control of both court and expert and certain replacements in the regulation of criminal procedure would harmonize requests of criminal procedure on the one hand and possibilities of modern forensic medicine on the other hand. However, even now, without some special changes in the abovementioned regulations, as well as in draft CCP, there coul be some improvements of the existant conditions, the strenghtening of process discipline, professional responsibility and more engagement (at the request of a court and on their own initiative), introducing additional forensic eductaion, more adequate ways of collection and securing expertise material, more critical and more professional relationship with the results of medical expertise, organisation of research centers within bigger courts and prosecution that would involve – the actively employed, doctors and similar.

The question of how much will the suggested innovations from draft CCP, without the suggested supplements, contribute the quality and efficiency of medical expertise in a criminal procedure will be answered in the future after the changes are implemented, but one thing remains undoubtedly: current state should be changed.

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Facial asymmetry of skeletal origin – correlation of some mandibular parameters

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Abstract

Introduction: Asymmetry of craniofacial region can be recognized as presence of size and shape difference in left and right side of the face and can be result of difference in shape and bad position of craniofacial bones. Degree of asymmetry is reduced and equality in left and right parts of the face is increased closer to the cranium. Skeletal asymmetry imply maxillar and mandibular alteration or both, as the alteration on other skeletal structures. Posteroanterior (frontal) cephalometry x-ray is the most helpful x-ray in face asymmetry analyssis, since distortion is minimum, so the comparation of left anad right side is the most accurate.

Aim of the study: The purpose of the study is to see the correlation between the deviation degree of mandible to the left or to the right, the length of the corpus and ramus of mandible and the size of the gonial angle in patients with facial asymmetry.

Material and method: The study has been conducted on 31 posteroanterior (frontal) X-rays (PA X-rays) of patients with facial asymmetry of skeletal origin. The following parameters were analyzed: the length of the corpus and ramus of mandible and the size of gonial angle on the left and the right side and the direction and the deviation degree of mandible (angle Me-ANS-SS). The acquired data have been statistically analyzed by Spearman test of correlation and regression analysis with several variables.

Results: The results of the study show that the angle Me-ANS-SS statistically significantly positively correlates with the gonial angle on the right side ($\rho=0.56$, $p<0.05$) and that the length of the mandible corpus to the left and the gonial angle on the right side, statistically significantly affects the size of the Me-ANS-SS angle, that is for the deviation to the right ($p<0.05$). Statistically important higher values of the corpus length were found on the right side and the Me-ANS-SS angle in the group with the deviation to the left ($p<0.01$).

Conclusion: The length of corpus and ramus of mandible, as well as the size of the gonial angle has a significant role in defining the facial asymmetry of skeletal origin. However, along with these, other parameters may have influence on the appearance, direction and degree of deviation of the lower jaw.

Key words: facial asymmetry, deviation of mandible

Introduction

Body symmetry is defined as the similarity in shape and relation around the same axis or plane of body. Clinically speaking, the symmetry means balance, while significant asymmetry is defined as imbalance, inequality of the same body parts on the opposite side. The point where the "normal" asymmetry becomes a significant one cannot be precisely defined and depends on the clinician's sense of the balance and the patient's perception of imbalance. Facial asymmetry which can be clinically proven starts from the one which is barely noticeable to the one where there are big differences between the left and the right half of the face[1].

More severe asymmetries of face and jaw, which can be easily seen by clinical examination, are more often in patients with dentofacial deformities. By studying the histories of 1460 patients of Dento-facial Clinic of the University of North Carolina (UNC), during the period from 1978. to 1996. clinically noticeable asymmetry was proven in one third of the patients. Usually the lower third of the face was asymmetrical[2]. The asymmetry of the upper part of the face was present in 5% of the patients, 36% had asymmetry in the middle part of the face, usually nose, sometimes with the asymmetry of the zygomatic region. Chin deviation was present in 75% of patients. Approximately, one half of the patients along with the asymmetry of the upper and lower third of the face also had man-

dible asymmetry. Chin deviation, if present, was always to the left, except for the "long face" group, which had equal distribution of facial asymmetry to the left and to the right. It seems that in the majority of patients with the asymmetric growth of mandible, there is a tendency of deviation to the side of the face which is more developed. It is unknown why patients with "long face" deformity are an exception to this rule. The fact that they have facial asymmetry does not necessarily have to be the main reason for coming to the orthodontist. On the contrary, if the facial asymmetry exists together with a noticeable skeletal problem, and they usually define that problem as the reason for their dissatisfaction with their physical appearance, and they don't mention facial asymmetry.

Haraguchi S, Iguchi Y i Takada[3] by analyzing photographs of patients' faces with different malocclusions, find that of those who had facial asymmetry, 79.7% had wider right half of the face, and 79.3% of patients had chin deviation to the left. Farkas LG and Cheung G[4] find that the facial asymmetry in physiologically developed persons is very common in mild form, and usually the right side of the face dominates. By using 3D scanner Einarsdóttir L et all[5] found that the facial asymmetry may exist in all the regions (eyes, nose, mouth, chin, lower and upper parts of cheeks). The highest asymmetry was app. 3-4 mm, and the biggest difference in the facial morphology of men and women was in the nose and cheek region. Acceptable facial proportion and harmony of the smile can be achieved despite the initial facial disproportion, if there is matching in the upper dental midline with the middle part of the face and if the width of the upper dental midline is in alignment with the width of the face. At the same time, the occlusal plane must be parallel to the bipupilar line and the chin must be centrally positioned, as much as possible[6]. These authors believe that the facial asymmetry is rather rule than exception. Staudt C and Kiliaridis S[7] find that in patients with the class III malocclusion, mandible asymmetry leads to the asymmetry of the dental arch, especially in the sagittal plane. The condylar asymmetry is the most significant factor that explains the 28-37% of the asymmetry of canine and molars. The authors claim that the asymmetry of ramus seems partly to compensate for the influence of condylar asymmetry on the occlusion.

In the etiology of facial asymmetry there are: a) genetic and congenital malformations; b) external factors, such as bad habits and trauma; c) functional deviations, such as compulsive deviation of mandible, due to bad interocclusal relations[8]. Facial asymmetry of skeletal origin demands, apart from orthodontic, also surgical treatment in adult period. To differentiate the facial asymmetry by its type to – dental, functional and skeletal type, is a precondition to therapy planning[9]. Irregular or asymmetric inclination may be just a consequence of dental asymmetry, but also it can camouflage the existing skeletal problem. Orthodontic patients with facial asymmetry, whether of dental, skeletal or functional origin, demand 3D diagnostic analysis. Facial asymmetries are commonly connected to functional disorder, and this demands together with thorough clinical analysis and analysis of study models, also the analysis of PA X-rays in order to define the nature and origin, qualification and quantification of the existing problem of facial asymmetry[10]. With PA X-rays we also can, although it is more difficult, follow the growth and analyze the results of the therapy.

Aim of the study

The purpose of the study was to see by PA X-rays analysis, to what extension, the size of corpus and ramus of mandible and the size of the gonial angle on the left and on the right side in patients with facial asymmetry of skeletal origin, define the direction and the degree of mandible deviation.

Material and methods

The study was conducted on the Dental Clinic of Medical Faculty in Niš. The patients chosen for this study, were from the territory of Niš and its suburbs, average age 18-25. The analysis included 31 persons, from which 11 were male and 20 female, none of them previously orthodontically treated. All of them had previously been diagnosed with facial asymmetry of skeletal origin, but persons with cleft lip, alveolar ridge and palate, as well as persons with facial asymmetry due to mechanic trauma, were excluded. PA X-rays were made by a "Siemens" device, strength 70 KV exposing each person according to their age (app. 1 sec.). The shots were done under the same

conditions for all patients: the head was positioned by cephalostat in natural position so that Frankfurt Horizontal is parallel to the floor and biauricular plane is parallel to the cassette and straight forward to the central ray, with face directed towards the cassette with the film. Dahan method was used for analyzing the following parameters: corpus and ramus length of the mandible and the size of the gonial angle on the left and right side, the size and the degree of the deviation, according to the Me-ANS-SS angle (Figure 1).

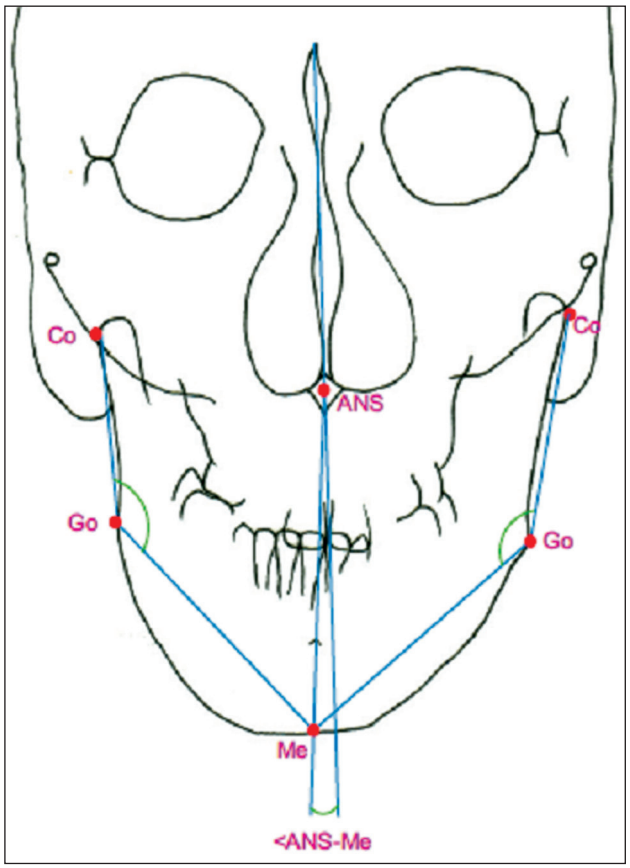

Figure 1. Analysed parameters by Dahan's method

The aquired data were statistically analzyed by Pirson or Spearman corellation test and by regression analysis with several variables.

Results

The coefficients of variation of all parameters according to Dahan are below 30 and the studied sample is extremely homogenous in this respect. The analysis of the PA X-rays of the patients with facial asymmetry of skeletal origin indicates that there are no significant differences in the average values of the analyzed parameters of the left and the right side of the face, although the average value of the length of mandible corpus is greater on the left, and the average value of the length of ramus is greater on the right, as well as the size of gonial angle (Table 1).

As the average values did not point to the cause for the occurrence of facial asymmetry in these patients, the statistical analysis of the correlation dependence of the side and the degree of mandible deviation from the lengths of mandible corpus and ramus and the size of gonial angle was conducted.

The Pearson's coefficient of linear correlation or the Spearman's rank correlation coefficient was used in establishing correlations between the examined parameters. The choice of the coefficient used depended on whether the examined parameters had normal distribution or not; hence, in cases of normal distribution, the Pearson coefficient (r) was used, and otherwise, the Spearman coefficient (ρ) was implemented.

The normality of distribution, considering the size of the examined group, was determined by the Shapiro-Wilk test. During the data processing by the Shapiro-Wilk test, it was determined that the values of all the parameters both in the cases of deviation to the left and to the right had normal distribution, except for the values of gonial angle on the right side in deviation to the right, and of the Me-ANS-SS angle in deviation to the left and to the right. Therefore, the Spearman correlation

Table 1. Comparison of the examined mandible parameters on the left and the right in patients with facial asymmetry of skeletal origin

Parameter	n	X ± SD	Cv	95%	CI	Min	Max	p vs ref
Ramus mand L(mm)	31	52,81 ± 6,16	11,66	50,55	55,07	37,00	63,00	
Ramus mand R(mm)	31	54,90 ± 7,99	14,56	51,97	57,83	42,00	75,50	n.s.
Corpus mand L(mm)	31	57,08 ± 9,32	16,33	53,66	60,50	43,00	88,00	
Corpus mand R(mm)	31	55,76 ± 7,70	13,82	52,93	58,58	39,50	76,00	n.s.
Gonial angle L(°)	31	130,02 ± 9,01	6,93	126,71	133,32	104,00	148,00	
Gonial angle R(°)	31	129,95 ± 8,29	6,38	126,91	132,99	112,00	143,00	n.s.

coefficient between the Me-ANS-SS angle and other parameters was used, and it was determined that the Me-ANS-SS angle statistically significantly correlates positively with the size of gonial angle on the right in the mandible deviation to the right (ρ=0.56, ρ<0.05). In the division of mandible deviations to the left and to the right, via a linear regression analysis, only the length of mandible corpus on the left and the size of gonial angle on the right, as isolated predictor variables, show statistically significant predictability of the dependent variable of the Me-ASS-SS angle and that only in cases of deviation to the right (ρ<0.05). The regression analysis with several variables, with the size of gonial angle on the right and the mandible corpus length on the left inserted in the model, identifies the mandible corpus length on the left as the most significant predictor variable that influences the size of Me-ASS-SS angle and the side of mandible deviation, with the regression coeficient identical to the one used in the univariate analysis (2.83).

The regression curves for the isolated statistically significant predictor parameters are:

Me-ANS-SS ^{o} = –12.74 +0.283 × mandible corpus length on the left

Me-ANS-SS ^{o} = –26.30 +0.23 × the size of gonial angle on the right

Statistically significant larger values of the mandible corpus length on the right and the values of the size of Me-ASS-SS angle were determined in the group with deviation to the left (p<0.01) (Table 2).

Correlations of the examined parameters were graded according to Cohen[11] as:

small: r=0.10 to 0.29
moderate: r=0.30 to 0.49 and
high: r=0.50 to 1.00

The sign preceding correlation (+ or -) indicates whether the correlation of parameters is positive (both variables grow and drop simultaneously) or negative (one variable grows while the other one drops and vice versa). The analysis shows that there are no statistically significant correlations between the Dahan parameters and the degree of mandible deviation to the left or to the right (Table 3).

Table 2. Values of the examined parameters (X ± SD) in relation to the side of mandible deviation

Parameter	Deviation to the right (n=13) X ± SD	Deviation to the left (n=18) X ± SD
Ramus mand L(mm)	52,96 ± 6,88	51,31 ± 6,29
Ramus mand R(mm)	50,58 ± 9,41	52,75 ± 6,64
Corpus mand L(mm)	59,85 ± 8,48	56,22 ± 8,99
Corpus mand R(mm)	52,31 ± 8,71	62,19 ± 8,37** Mann-Whitney
Gonial angle L(°)	130,46 ± 6,40	131,28 ± 8,48
Gonial angle R(°)	132,88 ± 9,67	131,44 ± 7,57
Me-ANS-SS(°)	4,19 ± 3,64	6,47 ± 3,36** Mann-Whitney

Table 3. Correlations between the side and degree of mandible deviation (according to Me-ANS-SS angle), and Dahan's parameters

	Correlated parameters					
	Ramus mand L(mm)	Ramus mand R(mm)	Corpus mand L(mm)	Corpus mand R(mm)	Gonial angle L(°)	Gonial angle R(°)
	and deviation of mandible (Me-ANS-SS) to the left					
r	-0,07	0,17	-0,12	0,51	0,45	0,11
p	0,7998	0,5358	0,6646	0,0540	0,0909	0,6919
N	15	15	15	15	15	15
	and deviation of mandible (Me-ANS-SS) to the right (ρ - Spearman's rank correlation coefficient)					
r	0,29	0,12	0,28	0,34	-0,03	0,31
p	0,2812	0,6483	0,2987	0,2016	0,8987	0,2485
N	16	16	16	16	16	16

However, it should be noted that there is high positive correlation between the degree of mandible deviation to the left and the length of mandible corpus to the right (r=0.51, p=0.0540), which is very close to the level of statistic significance of p<0.05, as well as a positive correlation between the same parameter and the size of gonial angle on the left (r=0.45, p=0.0909). The degree of mandible deviation, of moderate intensity, to the right correlates positively in the best manner between the length of mandible corpus on the right (r=0.34, p=0.2016), and the size of gonial angle on the right (r=0.31, p=0.2485).

Discussion

This study does not take into special consideration the gender, age and skelatal relation of the jaws since it has not been previously confirmed that these parameters influence significantly the occurrence of facial asymmetry[3,4].

In the studied cases, the frequency of mandible deviation to the left or right was approximately the same (because of which it has not been analyzed independently), as opposed to the results of other authors[12] who identified the occurrence of facial asymmetry in 70-85% of the cases, especially in the area of lower jaw, wherein deviation to the left was more frequent. They only found out that the studied cases who had problems with TMJ showed no uniformity in the deviation side; however, the degree of deviation was more perceptible. The analysis of PA cephalograms in adults with clinically symmetrical faces shows the existence of subclinical skeletal asymmetries of faces[13], wherein the asymmetry degree decreases in the examined skeletal structures closer to the cranium. Haraguchi S and Takada K[14] also confirm that the lower the point of analyzing the asymmetry of jaws, the greater the number of cases with asymmetry, wherein the mandible deviation to the left was most frequent. You KH, Lee KJ, Lee SH and Baik HS[15] consider that the appearance and size of the mandible condyle and corpus contribute to the occurrence of mandible asymmetry, but the role of condyle is more significant. Tridimensional computed tomography proved that mandible, condyle and corpus are longer in patients with facial asymmetry, whereas the coronoid process was significantly shorter on the side opposite to the side of mandible deviation, as well as the capacity of the ramus (a positive correlation between the length of mandible corpus and the opposite side of mandible deviation)[16].

Correlation statistical analysis of this study does not confirm the existence of significant relations between the examined parameters according to Dahan and the degree of mandible deviation to the left or to the right. However, there is a high positive correlation between the degree of mandible deviation to the left and the length of mandible corpus on the right, as well as a positive correlation between the same parameter and the size of gonial angle on the left. Mandible deviation, of moderate intensity, to the right correlates positively in the best manner with the length of mandible corpus on the right, and with the size of gonial angle on the right. If only the examined Dahan parameters of the analysis are taken into consideration, mandible deviation to the left is a result of the expanded length of mandible corpus and increased gonial angle on the left. Mandible deviation to the right occurs when the mandible corpus length on the right and the gonial angle on the right are increased. It is to show that the size of gonial angle determines the side of mandible deviation so that there is a positive correlation between these parameters, that is, the increase in the gonial angle on one side results in the mandible deviation to the same side.

Conclusion

Based on the results of this study, it can be concluded that the differences in the length of mandible corpus and ramus, as well as the difference in the size of gonial angle on the left and right side of face, each independently, do not have a crucial effect on determining the side and degree of the deviation of mandible in patients with facial asymmetry of skeletal origin. Positive correlations which exist between the length of mandible corpus, the size of gonial angle and the degree and orientation of mandible deviation are not high. The examined parameters together define the side and degree of mandible deviation only partly. In addition to these, there are also other parameters which significantly contribute to the occurrence of

typical facial asymmetry and which must be taken into account at the time of diagnosing and treatment planning.

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Acute extradural hematoma in elderly - case report

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Abstract

Background: Acute extradural hematomas are infrequent among elderly patients. Even with population getting older, there are only a few records in medical literature about these collections, typically related with low-speed traumatisms.

Case Report: A 81 year-old female patient, admitted in the emergency service after simple fall with hemiparesis at right, dysarthria and 11 points in Glasgow Comma Scale, with ischemic CVA as possible diagnosis. A computed tomography disclosed a fronto-temporo-parietal extradural hematoma at left. Five days after the evacuation of hematoma, patient was discharged, asymptomatic.

Discussion: The most frequent mechanisms involved with extradural hematomas in elderly are simple falls and assaults. A greater adhesion between bone and dura-mater makes these lesions more rare in elderly people, and lucid interval is less common. They have a precise surgical indication and a large spectrum of prognosis, depending on their extension, topography, comorbidities and pré-operatory Glasgow score.

Key words: hematoma; extradural; epidural; trauma; elderly.

Background

Intracranial traumatic lesions can be divided into focused and diffuse. Among focused traumatic lesions, we can cite extradural hematomas, subdural hematomas and cerebral contusions. Extradural hematomas occur due to low-speed traumas, frequently simple falls or assaults.

Global population is living a process of aging, which results in a increase of elderly population. Ancient patients (aged 65 or more) present greater risks for simple falls due to different reasons: lack of periferic sensibility caused by senescence and metabolic neuropathies, atrophy and weakness of musculature and diseases like spondilotic cervical myelopathy and demencies. All of these changes can cause problems in the march or the equilibrium and raise the risk for such accidents.

Falls among elderly people promote an increase of morbidity and mortality rates, long-term hospitalizations and complications related to this permanence in hospitals, like infections, thromboembolic events, psychiatric syndromes and metabolic imbalances.

The following case report calls attention for traumatic events in elderly population, with increasing occurrence rates and high risk of morbidity and mortality. This type of lesions should be evoked in the differential diagnosis of geriatric patients presenting neurologic syndromes in the emergency room and in the hospitalar services.

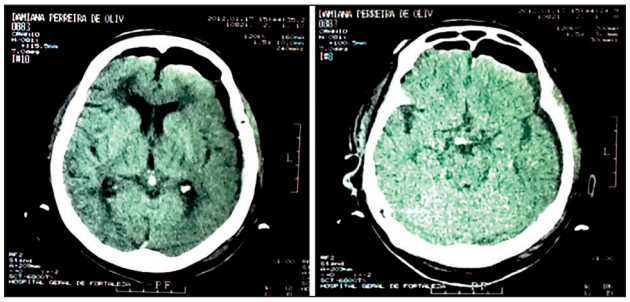
Case report

D. P. O., an 81 year-old caucasian female patient was admitted in the emergency service of the Hospital Geral de Fortaleza, an important general hospital located in Fortaleza, Brazil in January 15, 2012. She presented a suddenly-installed neurological deficit and had a story of simple fall followed by tonic-clonic quakes in both arms, vomit, obliviousness, misspeaking and motor deficit at right.

At the examination, patient presented a proportioned hemiparesis at right, with muscular strenght graded at two, dysarthria and obliviousness, without signals of meningism. She also had eleven points in the Glasgow Coma Scale. General physical examination showed no significant changes and blood pressure (130x80 mmHg), heart rate of (78 bpm) and respiratory frequency were normal.

She was a long-term tobacco smoker and social drinker. According to her sons, she had no earlier episodes of falls, seizures or significant headaches. The first proposed diagnostic hipotesis was a stroke.

A computed tomography of cranium disclosed a shape compatible with extradural hematoma in a fronto-temporo-parietal location at left, measuring about 35 by 83 milimeters and provoking a midline shift of about 7 milimeters. Imaging also showed a linear fracture in temporal area, without important sinking of bone fragments.



Images 1. Computed tomography showing evacuated hematoma.

Patient underwent to a neurosurgery, in the same day of admission, for evacuating the hematoma, through a temporo-parietal craniotomy, with aspiration of hematic collection, further cranioplasty with plates and synthesis. In immediate post-operative, she evolved positively, with regression of the motor deficit. On January 20, five days after surgery, she had hospitalar discharge, asymptomatic, with definitive diagnosis of acute extradural hematoma.

Discussion

Extradural or epidural hematomas occur in 1-3% of cranioencephalic traumas and are usually related to fractures of temporal bone (about 63% of cases) in its squamous part[2]. Middle meningeal artery runs over the external surface of dura mater, placed in a cannelure of bone's internal wall. Lacerations of this artery cause the formation of a blood collection between dura mater and bone, what characterizes the extradural hematoma. This collection presents fast expanding, due to the arterial flow and greater pressure[4].

Dura mater is intimally linked to cranial bones and acts as their periosteum, although without osteogenic function. Due to this anatomic relationship between meninx and bone, hematomas are round-shaped and circunscribed, limited by the adherence of dura mater and the blood under pressure flowing from the damaged artery. Generally, clinical findings occur due to the mass-effect caused by such collections, which can promote midline shift and uncus herniations[5].

Typically, extradural hematomas are lesions related to low-speed traumas[4]. The most common mechanisms of this type of lesions are simple falls[5] and, notably in periferic countries, physical agressions with contundent objects, due to high indices of interpersonal violence[6]. According to studies, male gender is the most affected by extradural hematomas, counting on 72% of all.

Intracranial hematomas are most probable to develop in elder patients than in younger, considering traumas of same intensity. However, about 60% of extradural hematomas occur in patients aged under 20[3]. The acute extradural hematoma, particularly, is rare among elderly patients, because of its slighter exposition to risk behaviors and an anatomic characteristic developed with age. Less than 1% of these lesions appear in patients over the age of 65[6].

This kind of collection is less common in elderly people due to a stronger adhesion between cranium and dura mater, what blocks a larger disattachment and a bigger expnsion of the hematoma, limiting its clinical expression[7]. This adherence can form in some patients the pseudoaneurism of middle meningeal artery, when the hematoma is limited between bone, meninx and adhesions and forms a continuum with arterial lumen, without greater neurological repercussions[8].

The clinical presentation of these patients is variable. Usually, patient gets unconscious at the moment of trauma, recovering in minutes or hours, what demonstrates an associated cerebral concussion. Further, it is frequent to happen a neurological deterioration and, if the hematoma is volumous and remains untreated, occurs herniation. Irregular and midriatic pupils, letargia, unconsciousness, misspeaking and contralateral hemiparesis are the most common findings on physical examination[4].

In more than 50% of patients, occurs a typical clinical manifestation of extradural hematomas called lucid interval, when patient stays conscious and oriented, with good neurological status and without apparent deficit, for a period of minutes or hours between the conscience recovering after trauma and the conscience deterioration promoted

by the mass-effect of hematoma[5]. In elderly, lucid interval in infrequent and the most common findings are cephalgia, motor deficits and seizures[7].

Extradural hematomas can be classified as acute or subacute. Acute ones need neurosurgery earlier than three days after trauma. Most of these undergo to intervention in the first 24 hours. Subacute cases include patients with four or more days of evolution before being operated[7].

Imaging investigation of an extradural hematoma starts with computed tomography, like for other cranioencephalic injuries. Characteristic image is a biconvez-shaped hyperdense collection, well-circunscribed. The most frequent location is frontotemporal in young people and frontal in elderly[9].

The treatment of extradural hematomas consists in surgical evacuation with an aggressive indication. Should be approached all the hematomas larger than 30 cubic centimeters of volume, 1 centimeter of width and causing a midline shift over 5 milimeters. Collections located in the middle or posterior cranial fossas need to be drained even when small and asymptomatic. In case of conservative conduct, should be observed the reexpansion phase, between the sixth and the fifteenth days[10].

While mortality rates of patients presenting extradural hematomas oscillate around 8%, when we consider only patients with 65 years or more, this rate achieves 25%[11]. Pre-operative Glasgow score of 14-15 represents good prognosis, but coma and unreactive pupils, even unilaterally, are associated with mortality rates of 90% or more[12].

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Effects of deep water running in older adults. A Systematic review

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Abstract

Aim: The aim of this study was to determine the effects of deep water running in older adults according to the collected and analyzed research papers published in the period from 1990 to 2011.

Methods: The following research bases have been used for the collection of research papers in which DWR was used as a form of exercise in water: Medline, Google schoolar, PEDro- Physiotherapy Evidence Database, Web of Science and Sportdiscus. While searching the bases of data the following key words were used:"deep water running", "deep water run", "deep water walking" and "aqua jogging". The obtained titles of research papers, abstracts and whole texts were then read and analyzed by two independent reviewers.

Results: Out of all analyzed research papers, the 10 papers met the established criteria: research must be a longitudinal study and the upper age limit of examinees must be 60 years of age and older. According to this review, a small number of collected papers (10) reflect a deficit of information in the scientific research regarding deep water running of older adults.

Conclusion: Despite the fact that is a substantial lack of this research, the analyzed studies show that deep water running produces physiological responses necessary for improving health, reducing pain and normal functioning in doing everyday activities in life of older adults.

Key words: benefit, older people, deep water running, review.

Introduction

Practitioners are constantly search for new and better methods of aerobic exercise. Preferably these methods should be attractive and therefore stimulate adherence (1) apart from only influencing human health. The search for attractive fitness activities is especially important for older adults due to the fact that they are often not considered when planning fitness centers and are therefore confronted with organizational, health, material and motivational barriers (2). For older adults who might also be obese, deep water represents an excellent motivational factor for exercising since the body is hidden from the view of other participants (3), so they feel less self conscious and more comfortable during exercise. Water exercise can produce positive effects due to physical characteristics of immersion in water, such as buoyancy, hydrostatic pressure, viscosity and at specific water temperatures warmth (4). With older adults, water not only has a therapeutic effect but also is suitable for adults with orthopaedic problems (5). Energy consumption is greater at any movement frequency due to the resistance of water. Exercise programs in water for older adults are related primarily to aerobic types of activities (6-9), of a cyclical character. Philips et al. (10) however, suggest implementing strength training so that the loss of the muscle mass due to aging might be slowed and thus decreasing the risk of falls and injuries.

As a large number of older adults have problems with the locomotor aparatus (11), exercise in deep water represents a beneficial alternative means of physical activity. With Deep Water Running (DWR) participants perform a running movement in a normal upright position aided by a floatation device so that one does not contact the pool bottom (12). Body movement should be similar to those when running, with a difference in the relative involvement of the upper and lower parts of the body (13). The advantage of DWR in older adults is that there is little loading of the skeletal system (14) which might be particularly sensitive due bone degeneration. This form of activity is becoming more popular with risk groups such as older and obese adults because they can exercise with a relatively

high intensity with minimal joint stress. Moreover, maximum mechanical work is as well as heart rate are lower when exercising in deep water in comparison with land-based exercising (15, 16).

Research has shown that high intensity DWR is an efficient means of improving cardio respiratory fitness in older adults (7, 17). The high intensity of exercise in deep water at low movement speeds is the consequence of the density of water as compared to air (18). Broman et al. (17) showed that the exercise tempo at 60% of maximal oxygen consumption (VO_{2max}) on land is equivalent to 85% of the maximal oxygen consumption during exercise in deep water. In addition during DWR hydrostatic pressure influences cardiovascular function, resulting in a greater stroke volume due to the lower heart rate paired with the increased blood flow to the heart (19, 20).

Therefore, the aim of this study was to establish the effects of physical exercise in deep water on the cardiorespiratory fitness of older adults according to the collected and analyzed research papers published in the period from 1990-2011.

Method

Literature search

For the purpose of this review Medline, Google schoolar, PEDro- Physiotherapy Evidence Database, Web of Science and Sportdiscus data base were searched. The search was limited to the previous 21 years, from 1990 to 2011. In searching the following key words were used:"deep water running", "deep water run", "deep water walking" and "aqua jogging". Reference lists were then examined and when no full paper was availalbe authors were contacted by mail. The research papers found were then examined by two independent reviewers. For inclusion in this review two criteria had to be met: DWR had to be included as a major part or the exercises intervention and study had to include at least some participants equal to or above 60 years of age. The Delphi list was then used to determine the methodological quality of these articles (21).

Theoretical approach to the problem

For the collection and review of the papers descriptive method along with the theoretical analysis was used. The procedure of analysis and elimination of research papers obtained is shown in Figure 1.

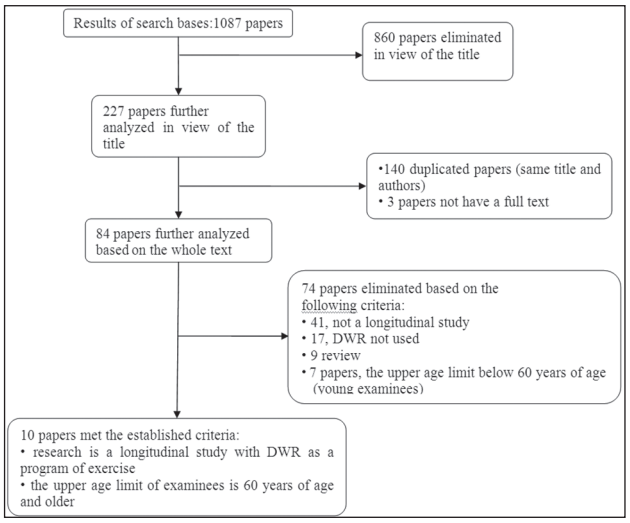

Figure 1. Results of search data bases

The initial key word search identified 1087 papers. Out of these, 860 research papers were immediately eliminated on the basis of the title and abstract leaving 227 papers for further analysis. Out of these 227 papers, 140 were doubles. Three research papers were eliminated due to no full text. The remaining 84 papers were then analyzed on the basis of their full texts. Out of 84 papers, 74 more were eliminated. Forty one papers were not longitudinal studies, in 17 papers DWR was not included in the exercise intervention, 9 papers represented review research and in 7 papers the upper age limit of participants was less than 60 years of age. The remaining 10 papers met the established criteria. Nine papers were published in 9 different journals, while the research of Chu (22) was a Master's thesis paper. Papers were published in the period from 1990 to 2011. Ten research papers which met the established criteria are presented in Table1. Figure 2 shows an overview of the selected studies including sample size, age, exercise program, (duration, water temperature), outcome measures, results and the methodological rating (DELPHI LIST).

Results

In total 276 examinees participated in this research. The majority of the participants (n=60) were included in the research by Assis et al. (23), and the minority (n=14) in the research by Kaneda et al. (24). In the above mentioned research (24), the participants abandoned the exercise program in the majority of cases (n=16). If we take into ac-

count all research papers, there were 36 such occasions. In four research papers, the sample was heterogeneous regarding the gender of the examinees (24-27). In the remaining six research papers, the sample comprised of women only.

In the research by Assis et al. (23) and Cuesta-Vargas et al. (27), the sample of the examinees comprised of women with fibromyalgia. In three research papers, the examinees were obese women (8, 28) and obese adults (26). In the research (27), the sample of examinees consisted of adults with non-specific low back pain. In the remaining four research papers, the examinees were healthy. The greatest age span was between 16 and 80 (23, 27). The youngest examinees were 18 years old. The oldest age group in the research was between 64 and 74 years of age (17).

The maximum number of groups in all research papers was two. In the research by Meredith-Jones et al. (28), Wouters et al. (26) only one experimental group participated. An experimental program comprising of one experimental and one control group has been presented in three research papers (17, 22, 29). In the paper by Jones et al. (8), the same program of exercise was applied to two groups of the examinees with different glucose tolerance. In the remaining four papers, the experimental treatment implied the application of two different programs of exercise i.e. two experimental groups (23-25, 27).

In all research papers, the exercise program involved the application of DWR, as a form of physical training (exercise) in water. In three research papers, DWR was used only in the main phase of training (6, 22, 26). In the research papers by Jones et al. (8), Cuesta-Vargas et al. (29), Meredith-Jones et al. (28), DWR was used in combination with training with resistance or in combination with MPP (Multimodal Physiotherapy Program). In three research papers by Kaneda et al. (24), Kaneda et al. (25) and Assis et al. (23), apart from DWR, the second experimental group applied normal exercises in water (NEW) or land-based exercises (LBE). In the research paper by Cuesta-Vargas et al. (27), one experimental group applied DWR in combination with MPTP (Multimodal Physical Therapy Program), whereas the other group applied MPTP only.

The longest overall duration of the exercise program was 15 weeks (23, 27), while the shortest was 6 weeks (26). The most frequent overall duration of the exercise program was 12 weeks (8, 24, 25, 28). In three research papers, the exercise program lasted for 8 weeks (22, 29, 6).

The shortest duration of training was 30 minutes, which has been explained in two research papers (22, 24). In the research by Broman et al. (6), the duration of each training was 44 minutes. The most frequent duration of each training (exercise) was 60 minutes in five research papers. The longest duration of training was 80 minutes (25, 27).

The lowest frequency of exercise per week was one training (24). The highest frequency was 3 trainings per week, in six research papers (8, 27, 29). In the remaining three, the frequency of exercise was two times per week.

The conditions in the swimming pools during exercise have been adapted to the DWR with water temperature from 27 to 31°C. In the analyzed research papers, the effect of the applied DWR programs has been established for different output measures (outcomes). The majority of these output measures represent the parameters of physical fitness which consist, according to (30), of cardiovascular fitness, muscular and skeletal fitness (muscular strength and stamina), body weight and composition, flexibility and balance. The most frequent parameters for the evaluation of cardio respiratory fitness and functional abilities have been: absolute and relative values of maximal oxygen consumption (VO_{2max}), heart rate (HR), pulmonary ventilation (PV), respiratory exchange ratio (RER), sistolic and diastolic blood pressure and the lactate concentration (BLac). To evaluate the morphological status of the examinees, the following parameters have been used: BMI, weight, waist-hip ratio (WHR), waist circumference and hip circumference (WC and HC). These parameters were the output measures in six research papers (6, 8, 22, 23, 26, 28). In order to evaluate muscular strength, the following tests have been used in two research papers (27, 28): the test of chest pressure (CP), flexion and extension in knee joints (KF and KE), Sorensen test for the evaluation of muscular stamina (ST) and the test of the maximum strength of lumbar muscles (MISL). To evaluate the balance, the following parameters have been used in two research papers (24,25): body sway distance (BSWD), body sway area (BSWA) and tandem walk time (TWT). In these

two papers (24,25), the additional tests for evaluating walking speed in older adults and the reaction time (NW and MW) have also been used.

Apart from the output measures for the evaluation of physical fitness parameters, the researchers have also applied the tests – the scales and the questionnaires - for the evaluation of the general health (SF-12, SF-36), quality of life (EQ-5D, IWQOL), visual analog scale of pain (VAS), depression (BDI), physical functioning of adults with fibromyalgia (FIQ), a questionnaire regarding disabilities (24-RMDQ), the attitude of a patient towards the applied therapy (PGART) and the benefit of physical exercise (PEBQ). These tests were used in four research papers (23, 26, 27, 29).

In all 10 analyzed papers, there were statistically significant changes in the results of certain tests after the application of DWR program. In tests with statistically significant differences between the initial and the final measures, the changes were positive for the examined groups of people. A statistically significant improvement in certain parameters of cardio respiratory stamina (VO_{2max}, VE and HRrest) was presented in the research papers (17, 28, 22). In the research papers by Meredith-Jones et al. (28), Cuesta-Vargas et al. (27), a statistically significant improvement was evident in the applied test for the evaluation of muscular strength and stamina (CP, KF, KE, MISL and ST). In the research papers of Meredith-Jones et al. (28), Jones et al. (8), Wouters et al. (26), there was a statistically significant reduction in hip circumference (HC), waist circumference (WC) and waist-hip ratio (WHR), whereas body weight and BMI remained unchanged. In four mentioned research papers (23,26,27,29) that used tests for the evaluation of the general health (SF-12, SF-36), quality of life (EQ-5D, IWQOL), visual analog scale of pain (VAS) etc., the applied exercise programs caused statistically significant improvement in the results of the applied analog scales and questionnaires.

Discussion

A small number of papers collected for the analysis (10) reflect a deficit in information needed for the scientific research regarding deep water *running* in *older adults*. Although the benefits of water for the human body have been known for a long time, water is primarily used for therapeutic purposes. However, water-based *exercises which* can benefit *older adults* and the advantages of water have been insufficiently explored. The analyzed studies show that deep water exercise produces physiological responses necessary for improving health, reducing pain and normal functioning in everyday activities in elderly people.

The analyzed research papers show that it is very hard to gather the adults who could be included in this exercise program; therefore, the number of the participants in DWR was between 10 and 30, although there were less than 20 participants in a DWR group in the majority of the research papers. It has been noticed that there were more women in the exercise process (even in 7 out of 11 research papers, women were the only participants). Therefore, according to the author, there is no such study which would treat only men in the process of DWR, as well as no comparative analysis of the cardiovascular response in relation to gender after the DWR program has been completed. In the half of the studies, more accurately in five, the participants were healthy, whereas in other studies, the adults had certain health problems such as fibromyalgia, (23,29), obese adults (8,26,28), and adults with low back pain (27). However, although it was determined that DWR decreases the heart rate and lowers blood pressure, not one of the papers included the adults with cardiovascular diseases and hypertension, so it is impossible to interpret the responses in this population, whose number is increasing. The quality of the conducted research can be seen in the fact that almost all the studies had both experimental and control groups, except for the studies by Meredith-Jones et al. (28), Wouters et al. (26).

Although experimental treatments differ in duration (from 6 to 15 weeks), the most common period of exercise was 12 weeks, 3 times a week (from 45 to 60 minutes). Having in mind that the results obtained after the twelve-week program of exercising were statistically significant ($p<0.05$), it can be concluded that this period represents an optimal duration needed to create positive effects on the cardiovascular system in older examinees. All exercise programs were continuous, so it is impossible to make a distinction between a continuous and an interval program of DWR, and conclude which one of them has greater influence on the cardiovascular system. Since the exercise program was performed

Table 1. Summary of articles

Reference	Population	Comparison group	Intervention	Duration of program	Pool temperature	Outcomes and Results	Delphi list
Assis et al., 2006	Sedentary female with fibromyalgia 18-60 years (n=60)	1.DWR (n=30) 2. LBE (n=30) drop out (n=8)	1.DWR 2. LBE	16min 3xwk 15wk	28-31°C	Both group sign. ↓ in VAS, , BDI, FIQ total, anxiety and depression scores, SF-36 physical and mental component, but DWR group show sign better results for FIQ total and depression scores, with no difference between groups. DWR group sign. ↑ in SF-36 role emotional. LBE group sign. ↑ in AT. No sign. change in PGART, peak VO2, Hrpeak.	7
Broman et al., 2006	Healthy elderly woman 64-74 years (n=29)	1.DWR (n=18) 2.Control(n=11) Drop out (n=3)	1.DWR 2. Control group	44min 2xwk 8wk	27°C	DWR group Sign. ↑ in VO2max absolute and relative, VE, sign ↓ HRrest and HRm. No sign change in SBP, DBP, HRmax and RER in DWR group.	6
Chu, 2000	Inactive healthy women 64.5±3. 5 years, 60-71, (n=20)	1.DWR (n=10) 2.Control group (n=8), drop out (n=2)	1.DWR 2. Control group	50 min 3xwk 8wk		DWR group. sign. ↑ in VE tested with TR and DWRp, Absolute and relative VO_2max, tested with TR. No change for RER, Blac and weight.	5
Cuesta-Vargas et al., 2011a.	Sedentary women with fibromylagia syndrome 18-60 years(n=44)	1.DWR+MPP (n=22) 2. Control group (n=22) Drop out (n=3)	1. DWR+MPP 2. Control group	60 min 3xwk 8 wk	28-31°C	DWR+MMPP group Sign.↓ in FIQ scores and sign. ↑ SF-12 and EQ-5D. No change in control group.	7
Cuesta-Vargas et al., 2011b.	Men and women nonspecific chronic low back pain 38.4± 11.3 (n=49)	1. MPTP+ DWR (n=25) 2. MMPTP (n=24) drop out (n=3)	1. MPTP+ DWR 2. MMPTP	60+20 min DWR 3xwk 15wk	27.5°C	Both group sign ↓ in VAS, 24-RMDQ scores and sign. ↑ in SF-12 physical component, LS-ROMflex, MISL and ST. No sign. change in SF-12 mental component.	7

Jones et al., 2009	Overweight women NGT (37-65) IGT (39-64) (n=15)	1. NGT(n=7) 2. IGT (n=8)	1. WBCP	60min 3x wk 12 wk	29°C	No sign. change in ili for weight, BMI, VO2peak, HRpeak, or RER NGT group significant ↓ in WC and WHR. IGT group significantly ↓ in WC, 2HGL and FPI	6
Kaneda et al., 2008	Healthy elderly adults60.7±4.1 yr (n=46)	1.DWR (n=15) 2.NWE (n=15) Drop out (n=16)	1.DWR 2.NWE	80min 2xwk 12wk	30 °C	DWR group Sign↓ in BSWD, TWT. NWE group sign.↓ in BSWA. Bouth group sign. ↓ in RT. No Sign. change in NW, MW at the end of program.	4
Kaneda et al., 2006	Healthy elderly 60.9±5.3, (n=14)	1.UF (n=7) 2. NW (n=7)	1.UF 2. NWE	30min 1xwk 12 wk	30°C	NW sign. ↑ in BSWD and BSWA. UF sign. ↓ in TWT.	3
Meredith-Jones et al., 2009	Overweight women 59 ± 9 years, (n=19)	1. ACT=18 drop out (n=1)	1. ACT (DWR+RT)	60 min 3xwk 12 wk	28.5 °C	Sign.↑ in VO2peak, CP, KE, KF, and sign. ↓ in WC, WHR, HC. No sign. change in BMI and weight	3
Wouters et al., 2010	Obese adults 28-60 years (n=15) drop out(n=1)	AQJ (n=15)	1. AQJ	60min 2x wk 6 wk		No sign change in weight, BMI, fat%, HRrest, HR6MWT, BES, two dimension of IWQOL and two dimension of PEBQ. AQJ group sig ↓ in FM, WC, D6MWT and sign ↑ in three dimension of IWQOL and two dimension of PEBQ.	2

DWR-deep water running; **LBE**-land based exercise; **NWE**- normal water exercise; **UF**-upright floating exercise group performed DWR; **DWR+MPP** -DWR and Multimodal Physiotherapy Program; **MPTP**- Multimodal Physical Therapy Program; **ACT**-aquatic circuit-training consist of DWR and resistance training; **AQJ**-Aqua jogging program consist of DWR; **WBCP**- water-based circuit program consist of DWR and resistance exercise; **WC**-Waist Circumference; **WHR**-Waist-hip ratio; **HC**-Hip Circumference; **CP**-Chest Press; **KE**-Knee Extension; **KF**-Knee Flexion; **BMI**-Body mass index; **FM**-fat mass; **fat%**- fat percentage; **LS-ROMflex**-Lumbosacral Range of Motion in flexion; **MISL** -Maximum Isometric Strength of Lumbar; **ST**-Sorensen test for muscular endurance; **HRmax**- maximal heart rate; **HRrest**-hart rate in rest; **AT**- anaerobic treshold; **DBP**-diastolic blood preassure; **SBP**-systolic blood pressure; **VE**-pulmonary ventilation; **Vo_2max**-maximal oxygen consumption absolute and relative; **VO2peak**-peak oxygen consuption; **HRpeak**- peak heart rate; **HRm**- mean heart rate; **RER**- respiratory exchange ratio; **Blac**-blood lactate concentration; , **TWT**- tandem walk time; **BSWD**-body-sway distance; **BSWA**- body sway area; **RT**- reaction time; **NW**-normal walking speed; **MW**-maximal walking speed; **HR6MWT**- heart rate after six minute walk test; **D6MWT**- distance of six minute walk test; **BES**-Borg exertion score; **IWQOL**-Impact of weight on quality of life-short form; **PEBQ**- Physical Exercise Belief Questionnaire; TR-treadmil test; **DWRp**-deep water running testing protocol; **NGT**-normal glucose tolerance; **IGT**-impaired glucose tolerance; **2HGL**- glucose levels; **FPI**-fasting plasma insulin; **VAS**-Visual analog scale of pain; **24-RMDQ**- Roland Morris Disability Questionnaire; **PGART**- patient global assessment of response to therapy; **SF-36**-Short Form 36 Health Survey; **BDI**- Beck depression inventory; **FIQ**-Fibromyalgia Impact Questionnaire; **SF-12**-Short form-12 health survey for determined general health; **EQ-5D**- for determined quality of life; **sig.**↑-significant increase; **sig.**↓-significant decrease

in water, the temperature of water has a significant influence during experimental treatment (27-31°C in all analyzed studies).

Due to the diversity of the applied questionnaires during the experimental treatment, the authors of this research cannot make a general opinion regarding the state of health, quality of life, relationship between the patient and the exercise, benefits of physical activity, estimation of pain, depression and functioning before and after the DWR. These are the deficiencies in the studies, since it is very important to have feedback from the examinees about their attitudes regarding deep water exercising.

In numerous studies (15, 18, 20, 23, 24, 31, 32,3 3), the comparisons between the cardio respiratory responses during land-based exercising and exercising in deep water brought about similar conclusions. The maximal oxygen consumption is lower in deep water exercising because the percentage of anaerobic metabolism is higher (33), as well as the concentration of lactate (31) in comparison with land-based exercising. DWR program including 60-minute exercising 3 times a week at the intensity of 70-75% of the maximum heart rate (Hrmax) led to a statistically significant increase ($p<0.05$) in the maximal oxygen consumption - from 1.37 ± 0.10 to 1.51 ± 0.08 L/min, in adult older than 60 (8). A statistically significant increase in VO_{2max} parameters ($p<0.05$) in the experimental group, in comparison to the control group, as well as relative oxygen consumption, ventilatory volume was established after a eight-week program of deep water running in older women (17). Taking into consideration that the group comprises of older women, the possibility of high intensity exercise can improve aerobic power (17), in cases of interval exercising at the intensity of 75% Hrmax. The same group of authors determined a statistically significant decrease ($p<0.01$) in the heart rate both in rest (8%, $p<0.01$) and during submaximum exercising (3%, $p<0.01$) after an 8-week program of exercising, with a 10% increase in VO_{2max} and a 14% increase in the maximum pulmonary ventilation at the same time.

One of the reasons of lower values of the heart rate during deep water exercising in comparison with land-based exercising is the lower concentration of adrenaline excretion during exercising in water (34) which causes a decreased stimulation of the sympathetic system directly related to the heart rate regulation. The sympathetic system which directly decreases the heart rate during deep water exercise is affected by hydrostatic pressure and thermodynamic factors that facilitate heat exchange between the human body and the environment surrounding the body, due to the increased density of water (33). However, the role of hydrostatic pressure during deep water exercising is twofold and it stimulates the capillary proliferation and oxidative enzymes (17). Consequently, the improvement in sub maximum physiological work capacities, such as the heart rate and the maximal oxygen consumption in older adults, reduces the influence of stress on the myocardium during usual daily activities (17).

Blood pressure represents one of the important physiological parameters with older adults whose regulation and control is especially important in preventing the occurrence of many chronic cardiovascular diseases (35). Indisputably, the process of aging causes certain degenerative changes which cause the reduction of specific body parts - one of them being a reduction in a rib cage volume, especially after the age of 60 (14). These changes proportionally affect pulmonary functioning by reducing the capacity of lungs, which plays an important part during exercise in older people, regardless of the fact whether it is deep water exercise or land-based exercise (36). However, although the respiratory capacity is reduced by certain exercise programs, these changes can be slowed down and minimized, and certain functions of the respiratory system can be even increased, no matter they are related to older adults. This is what Chu (22) determined after an 8-week deep water exercise program (30 minutes of exercise, 3 times a week), by obtaining a statistically significant improvement in pulmonary ventilation for 15% ($p<0.05$) and respiratory exchange ratio in adult women. One of the shortcomings of deep water exercise is the insufficient stimulus of the skeletal system during exercise, which can produce contraindications and a rapid reduction of bone density, especially in women (8). Therefore, it is recommended to implement both cyclical aerobic exercise and strength exercise in the exercise program, in order to compensate for all the shortcomings, due to the fact that the strength training is beneficial for the preservation of bone density. Moreover, the program of deep water running represents an op-

timal stimulus for older slenderly adults, because it shows a positive correlation between the bone density and the strength development (37). This is necessary for normal functioning and lowering the risk of potential falls and injuries after the age of 60, while there is a significant reduction in the number of muscle fibers in older adults. The results of earlier research papers show that after the age of 50, one loses approximately 10% of muscle fibers during every decade of one's life (38).

Assis et al. (23) concluded that after 15-week deep water running at the intensity of the anaerobic threshold, the reduction of the pain occurs in 36% of patients with fibromyalgia. The acceptability of the deep water exercise program in adults with fibromyalgia has been confirmed (29). This program can be both beneficial and safe for the health of patients. When it comes to the subjective sense of the intensity during deep water running, older women have a more reduced sense for intensity in comparison with the real intensity of their exercise (17).

In the research papers by Cuesta-Vargas et al., (27) and Assis et al. (23), the applied exercise programs in both experimental groups produced a statistically significant reduction of the feeling of pain in adults with nonspecific chronic low back pain. It indicates that DWR has a positive influence on the reduction of the feeling of pain, but there are no advantages in comparison to the program of land-based exercise (LBE) and MPTP.

The benefits of water-based exercise can be seen in the fact that there were no injuries during experimental treatments, even thought these exercises involved older adults. Therefore, this program of exercise is very safe for the participants, and it offers social benefits (Jones et al., 2009), such as pleasant feelings and new friendships.

The studies analyzed above show that deep water is a very beneficial environment for older adults, especially because it reduces the pressure on joints during the exercise. Also, it offers an opportunity to keep a high intensity of exercise by relatively low amplitudes of movement, which significantly affects the cardiorespiratory system and preserves vital functions of older adults. Also, this synoptic study shows that water is a very beneficial environment not only for the rehabilitation, but also for the exercise programs in adults older than years of age.

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Alteration in biomarkers of oxidative stress in judokas with different age

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Abstract

Increased intensity of physical activity is accompanied by increased consumption of oxygen throughout the body, especially by skeletal muscle. Part of this oxygen, is transform into mitochondria in H_2O, while a smaller part (2-5%) makes a reactive oxygen species, toxic forms of oxygen. The aim of this study was to determine eventual differences in oxidative stress parameters, in judokas different age, after applied training. The sample of this research includes 24 elite judokas, different age, divided into three groups according to age categories. Monitoring the changes in oxidative stress biomarkers was determined by activity of superoxide dismutase (SOD), glutathione reductase (GSH-R), glutathione peroxidase (GSH-Px), catalase (CAT), and total antioxidant capacity (TAS). After applied training SOD, CAT and GSH-Px activity in judokas senior age, increased statistical significantly, in compared with judokas of younger senior age. Also, statistically significance increased was noted in SOD activity in senior age judokas, in relation to junior age judokas. Obtained data of this research has shown that training program and maximal load during training, which require modern judo, cause alteration in some biomarkers of oxidative stress. These changes are expressed in higher level in judokas senior age, which can cause oxidative stress.

Key words: Oxidative stress, judo, physical activity

Introduction

There is a growing body of evidence that the appearance of free radical fulfils important physiological functions in cells, and that a balance between antioxidants and free radicals is necessary for desired physiological adaptations (Gomez-Cabrera et al., 2008, Ji, 2008).

According to the theory of aging which is based on free radicals, in the process of aging, the natural antioxidant capacity of the organism weakness as a result of genetically programmed reduction in the synthesis of antioxidants, or due to reduced absorption of antioxidant vitamins, which also induces the activity of reactive oxygen species and leads to aging. Aging is associated with increased free radical generation in the skeletal muscle that can cause oxidative modification of protein, lipid, and DNA (Radak et al., 1995). Physical activity has many well-established health benefits, but strenuous exercise increases muscle oxygen flux and elicits intracellular events that can lead to increased oxidative injury. Research evidence indicates (Cooper et al., 2002) that senescent organisms are more susceptible to oxidative stress during exercise because of the age-related ultra structural and biochemical changes that facilitate formation of reactive oxygen species (ROS). Free radicals are thought of as perpetrators of cell damage, ageing, even cancer, whereas antioxidants are seen as defense against these threats (Fabel et al., 2003; Gross et al., 2011). Furthermore, in low concentrations free radicals may also have positive effects and help maintain muscle force production (Jackson, 2009). Substances that protect the cells of our body from free radicals are called antioxidants. The capacity of their production is not only determined by genetic and gender (Dopsaj et al., 2011), but also with age and lifestyle of the organism (Voss and Siems, 2006; Veglia et al., 2006). When is the condition of the body is such that there is increased production of free radicals with reducing possibility of their removal and neutralization,

it talks about state of oxidative stress that can lead to pathophysiological changes in the human body (Halliwell and Gutteridge, 1999; Booth and Lees, 2007). Enzymatic antioxidant activity (SOD, CAT and GPX) is quantified in a large majority of studies (Radak et al., 2008). This method can evaluate the quality of antioxidant protection at rest but can also show the importance of oxidative stress, especially after physical activity.

The aim of the present investigation was to examine potential changes in oxidative stress biomarkers after acute training in the three different age groups of highly trained judokas. We hypothesized that acute training would results in oxidative stress biomarkers change, in higher level in athletes of senior age group.

Material and methods

The sample consisted in 24 male judokas divided into three groups according to age categories. There were divided to athletes age, as follows: juniors (group A), younger seniors (group B) and seniors (group C) from Serbian national team. Tested athletes were subjected to a training regime consisting in a minimum 10 hours of work out per week, in the last 4 years. Prior the testing, all subjects were informed about the requirements of the study and gave their consent when accessing the research. All subjects underwent a detailed medical examination during which it was established that all subjects were in excellent health without cardiovascular, respiratory, endocrine or other disorders.

Blood collection and biochemical analysis

Blood samples were taken from the antecubital vein inside of the elbow into plain vacutainer tubes. The site was cleaned with germ-killing medicine (antiseptic). The health care provider wrapped an elastic band around the upper arm to apply pressure to the area and made the vein fill with blood. Blood samples were taken from all subjects in the morning immediately after the training. Serum samples were used to determine the activity of the enzymes: superoxide dismutase (SOD), glutathione reductase (GSH-R), glutathione peroxidase (GSH-Px), catalase (CAT) and total antioxidant activity (TAS).

Study protocol

Prior the testing all participants were given detailed instructions and got familiarized with testing procedure. Maximal oxygen consumption (VO_{2max}) was assessed with the COSMED treadmill (Model T 170). Data were collected with COSMED gas analyzer (CPET). The protocol itself included progressive increments of workload at the rate of 2km/hr every 2 min until exhaustion. The test was considered completed when the respiratory quotient reached the reference values, while the subjective state of each participant was monitored during the protocol.

Statistical analysis

All values are expressed as mean ± standard deviations. The Statistical Package for Social Science (SPSS version 19.0 for Windows) was used for analyses. One-way ANOVA followed by Scheffe's post-hoc test were used to compare mean values in 3 subgroups of judokas.

Results

General characteristics in three groups of judokas with different age are presented in Table 1. The mean VO_{2max} values of each group are also shown in Table 1.

Table 1. Physical characteristics and aerobic capacity in junior, younger senior and senior age group of male judokas

Variable	Group A (N=8)	Group B (N=8)	Group C (N=8)
Age (year)	17.6 ± 0.4	21.9 ± 1.2	26.9 ± 0.9
Body Weight (kg)	68.9 ± 10.1	71.9 ± 5.4	81.6 ± 5.9
Height (cm)	172.5 ± 5.3	173.5 ± 2.1	180.6 ± 5.6
Vo_{2max}/kg	53.1 ± 2.2	56.5 ± 3.1[a c]	50.6 ± 2.5

Values are expressed as mean ± SD.

Table 2. Antioxidant enzyme activity and total antioxidant capacity in judokas with different age groups

Parameter	Group A (N=8)	Group B (N=8)	Group C (N=8)
SOD (U/gHb)	1222 ± 62	1238 ± 43	1295 ± 21 [a b]
CAT (kU/gHb)	325 ± 23	293 ± 46	360 ± 40 [b]
GSH-R (U/gHb)	11.5 ± 0.1	11.0 ± 0.6	11.7 ± 0.2
GSH-Px (U/gHb)	71.2 ± 0.5	70.6 ± 1.2	72.1 ± 1.2 [b]
TAS (mmol/L)	1.30 ± 0.04	1.30 ± 0.03	1.32 ± 0.07

Values are expressed as mean ± SD.

In the present study Vo_{2max} values of male judokas exhibit variation in different age categories, and it has been seen that during adolescence (under 19 years), aerobic capacity is higher in compared with senior age group of judokas, and lower in compared with younger senior age group.

It has been seen (Table 1) that judokas in younger senior age group have had the highest values of Vo_{2max} in compared with A and C group Therefore, the increases in Vo_{2max} ensures higher rate of oxygen supply. It can be stated that body mass increases and Vo_{2max} decreases as the age of the judokas increases.

An important finding, in the results of judokas, is that the activities of primary antioxidant enzymes (SOD, GPX-Px and CAT) increased with age after applied training (Table 2). The antioxidant enzyme activities were similar in both A and B groups. However, the relationships between activities of the examined enzymes were significantly different in compared with C group. After training, the senior age group of judokas had higher values for all antioxidant and oxidative stress markers as compared to the A and B group. The results of primary antioxidant enzymes in senior age group has shown statistically higher values of SOD, CAT and GSX-Px in compared with B group, as well as higher values in SOD activity in compared with group A. However, no statistically significance change in GSH-R and TAS activity was observed between groups. These results indicate that older athletes with lower values of Vo_{2max} respond to oxidative stress by increasing SOD, GPX-Px, and CAT activity.

Discussion

Numerous studies have investigated the antioxidant enzyme activity in the blood or in tissue after both aerobic and anaerobic exercise in judokas (Radovanovic et al., 2009; Trivic et al., 2011), but only few have examined the additional impact of age and acute phase response on oxidative stress state (Martinovic et al., 2009; Mrowicka et al., 2010).

Training can have positive or negative effects on oxidative stress depending on training load, training specificity and the basal level of training. Physical exercise can increase oxidative stress and causes disruptions of the homeostasis (Finaud et al., 2006), so the free radical eliminating capacity is an important factor in adaptation to training and exercise. One response to the elevated oxidative stress associated with exercise is increased oxidant defense via up regulation of powerful antioxidant enzymes like SOD, CAT and GSH-Px.

Results of this research have shown that judokas in senior age group had significantly higher value of these parameters after applied training in compared with junior and younger senior group of judokas. Superoxide dismutase (SOD), along with catalase and glutathione peroxidase, form the front line of the body's antioxidant enzyme defenses. This study demonstrated remarkably higher activities of enzymes (SOD, CAT and GPH-Px) in senior judokas in compared with younger age group of judokas (Table 2), while no difference being found for GSH-R and plasma TAS. Physical exercise seemed to increase accumulation of free radicals as a response to the increased oxygen utilization (Carmeli et al., 2000). Elevated metabolic rates as a result of exercise may dramatically increase oxygen consumption (VO_{2max}). Importance of aerobic power to judo performance is controversial. While some authors (Franchini et al., 2005) did not found significant differences in VO_{2max} between elite and non-elite judo players, some results (Muramatsu et al., 1994) indicate that aerobic power has a positive influence in high-intensity intermittent exercise. In addition, research (Jenkins et al., 1984) has shown positive correlation between oxygen uptake and antioxidant defense enzyme activity.

A result of the research (Table 1) has shown that $V0_{2max}$ values were statistically significantly higher in younger senior group of judokas in compared with other two groups. This results can be interpreted as indicating a need to improve the aerobic capacity in senior group of judokas. Several study showed that most of judokas have $V0_{2max}$ values between 50 and 60 ml/kg/min, using different protocols and equipment (Franchini et al., 2007, Trivic et al., 2009).

Like most other protective mechanisms in the body, the production of SOD decreases with age (Di Massimo et al., 2006), while a cell's susceptibility to oxidants increases, putting the cells under increasing oxidative stress. The SOD activity was linearly higher with age, as a consequence of longer training experience, which was expected as this enzyme undergoes exercise-induced adaptation. Statistically higher values of CAT and GSH-Px were noted also in senior age group (Table 2), in compared with group B. We consider that obtained results are consequence of age and low $V0_{2max}$ values in senior group of judokas. No change in GSH-R activity was observed between groups. Generally, there were only slight differences in the antioxidant enzyme activities (Table 2) between A and B groups, which correspond to findings of other researchers that antioxidant enzyme activity significantly changes only when ROS is produced in large quantities (Spasic et al., 1993). Data concerning the effects of a lower $V0_{2max}$ and increased antioxidant enzyme activities in senior age group of judokas are probably results due to differences in higher age of senior judokas and their lower fitness prepare in compared with group A and B.

Conclusion

Obtained data suggest that oxidative status parameters are adequately changeable in athletes, with different age and sport experience. Therefore, older athletes require higher intakes of antioxidants to defend against increased oxidative stress. Currently, from obtained results it is clear that athletes with higher sport experience have potential to result in increased free radical production, which may or may not result in acute oxidative stress. The present study revealed the need of antioxidant supplementation in judokas with higher sport experience, in compared to younger judokas. A significant increase in plasma CAT, SOD and GPX can be considered negative effects in senior age group of judokas, since certain biomarkers of oxidative stress are increased after judo training in senior age group. Age apparently plays a significant role in process that can lead to free radical generation in judokas. So, future research may investigate the methods of reducing macromolecule oxidation, possibly through the use of antioxidant supplementation and with improved aerobic capacity in senior group of judokas.

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Our attitude towards the treatment of the anorectal prolapse

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Abstract

Anorectal prolapse is a condition in which the lower end of the colon, located just above the anus, becomes stretched out and protrudes out of the anus partially or completely. It is common in childhood as well as in aging people but taking both sexes into consideration, it is much more common in women than men (84% to 16%). Most often it comes from the weakening and atony of pelvic floor, rectal hiatus and weakening of the anal sphincter muscle, which was pointed out by Janel (1896); Quenu, Duval, Moskowitz (1910.); Pemberton i Stalker (1939); Goligher (1958). There are also other factors which may contribute to the development of the anorectal prolapse like age, sedentary jobs, illnesses, injuries, operative interventions, habits, birth trauma, episiotomy...

The aim of this work is the retrospective analysis of the surgical treatment and the prospective monitoring of the patients who have been treated for the prolapse. This work points out the causes of the formation, the importance of the adequate surgical treatment of many disorders and injuries of the anorectum as well as our surgical attitude towards the treatment of the prolapse.

Since a lot of patients conceal their problem with the anorectal prolapse, it is very important to convince them that their problem can be solved. In the casuistry of the Clinic for abdominal surgery and private health insitution ‘Alea-dr Kandić’, durin,g the two year period (from 2009 to 2010), there were 59 anorectal prolapse repairs after which retrospective-prospective analyses were done. The diagnosis was obtained on the basis of anamnestic data, clinical examination, local assessment and other methods of functional examinations of anorectum. There were 41 patients (69.5%) with the prolapse (first degree) who were treated with THD (DG HAL-RAR) with mucosectomy and recto-anal repair.

There were 4 patients (6.8 %) with adult prolapse (second degree) who were treated with supradental mucopexy.

Out of 8 patient with the third degree prolapse (13.6 %), two of them had gangrene of prolapse so they had transanal resection in emergency service. Combined abdominal and perineal intervention was performed on 5 patients (rectopexy, perineoplasty, gracilis muscle transfers). One of the patients was too old for other interventions but perineal one. It is very important to emphasise the reconstructive approach to all three portions of sphincters. After a certain period, there are positive results, especially with patients with incontinency whose functions in most of cases have significantly improved and made the life easier. So far there have been no complications registered. Anorectal prolapse is a serious medical and social problem which can make patients desperate if an adequate surgery is not undertaken. An adequate prevention of the prolapse formation is very important as well as an adequate surgery treatment of the cause of prolapse formation. Post-surgery patient education and physical treatment are also very important.

Key words: anorectal prolapse, prevention, surgical treatment

Introduction and significance

Anorectal prolapse is a process of circumferencial prolapse of the lower end of the colon into the anal canal or through it. It can be a complete anorectal prolapse, and a partial, incomplete (mucosal) prolapse.

It is much more common in women than men (84% to 16%) especially in women in the 5th and subsequent decades. Men can suffer from it even before they are 30 especially in case they perform heavy physical labour. It is also seen in children aged 2 to 4 (rarely to 6). The most often cause of

prolapsed formation is a weak pelvic floor with deep and flabby rectovaginal and rectovesical fascia, damaged structure of rectal hiatus and sphincter muscle, which was pointed out by Janel (1896); Quenu, Duval, Moskowitz (1910.); Pemberton i Stalker (1939); Goligher (1958) (8, 9, 19). Weakness of pelvic fascia separates levatore and puborectalis muscles (pressure in pelvis) and also extends hiatus recti through the pelvis diaphragm in which bowels fall. The absence of normal fixation of the rectum with the surrounding tissue with wide hiatus recti as well as the loss of sacral rectal curb contribute to the protrusion.

There are also some other factors such as age, sedentary jobs, numerous ailments, injures, habits, diets, operative interventions, birth trauma and episiotomy. Provoking factors are the diseases which inhanse the intra-abrominal pressure as well as long-lasting usage of laxantia. The main signs are the findings of prolapsed mucosa or whole circumference of the rectum through the anal canal but also erosions, ulcerations, and sometimes gangrene.

In the case of hemorrhoidal prolapse, it is anal musoca which prolapses. Anorectal line is lowered and you can see anal papillae and Morgagny cript on the prolapsed colon.

In the second degree of rectal prolapse you can see a zoned format with radial circumferential gathers of the rectum which centre is in anal opening. The internal prolapse is followed by inexplicable pain in pelvis, long-lasting constraint during the bowel movement and sometimes with narrow stool.

In the third degree of rectal prolapse (procidentia), there are longitudinal gatherings of rectal mucus placed in backward direction.

Palpation assessment of the double wall prolapse, palpability of the ring, atony and relaxation of sphincter and levator ani as well as elongation of anorectal fascia are very significant signs. A lot more than double mucus can be palpated especially at the front side. The bowel is hanging out of the anal canal with dilated veins.

Usual signs are also nuisances in defecation with no urge to defecate, constipation, pain in pelvis during the defecation, mucous secretion, initial incontinence as well as flabby anus with loose mucus which protrudes through it. The usage of laxatives causes diarrhoea and incontinence alvi et urinae.

During the strain, the mucus of the rectum prolapses and if the strain countinues, rectum prolapses resembling a bloated sausage. Secluded life, introversion, antisocial behaviour as well as neurotic manifestations are always present.

Tumours of the rectum imitate prolapse by getting out together with the rectum. Haemorrhages, ulcerations, infections, perianal manifestations, incontinency, incarceration, gangrene, rupture of prolapse are some of the most often complications (9).

The aim of the study

The aim of this study is a retrospective analysis of the surgical treatment of anorectal prolapse and a prospective monitoring of the patients who have undergone the treatment, speacially paying attention to emphasise the etiopathogenic factors of its formation, its prevention and our attitude toward its treatment by analysing some factors of etiopathogenic factors.

Material and methodologies

During the two-year period (from 2009 to 2010), the combined analysis of surgical treatment of anorectal prolapse was performed on the material of the Clinic for abdominal surgery KCUS and the private health institution „*ALEA - dr Kandi*ć".

Discussion and the results of the study

On the basis of 59 patients, the most often causes of anal prolapse were the following:

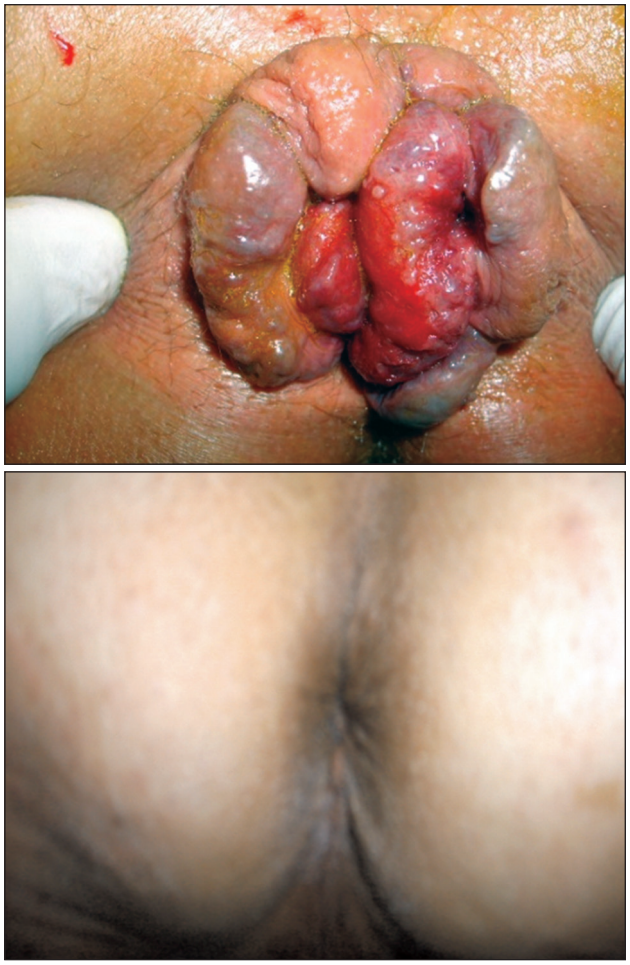
- hemorrhoidal origin (hemorrhoidal anal prolapse) – 41 patient (69.5 %)
- procidentia – 8 patients (13.6 %)
- rectal prolapse (second degree) – 5 patients (8.5 %)
- prolapsus adultus – 4 patients (6.8 %)
- intestinocoellae transvaginalis -1 patient (1.7 %)

All patients with this degree of anal prolapse (41 patients-69.5 %) were treated with **THD (DG HAL-RAR with mucosectomy)** and the results of the treatment were excellent. STARR was applied to 8 patients.The reason for that was the expensive apparatus and the dilemma caused by possible stricture of anocutaneous line because of suture clasps. Six patients responded with faecal urgency up to

Table 1. Anal polapse with hemorrhoidal orgin

Diagnosis	Number	% ratio
Anal prolapse with the hemorrhoidal origin	41	69.5
Procidentia (third degree)	8	13.6
Prolapse (second degree)	5	8.5
Prolapsus adultus	4	6.8
Intestinocoellae transvaginalis	1	1.7
Total	59	100.0

three weeks. After the three weeks, the function of anal canal was completely regained. We want to point out that hemorrhoidectomy related to insufficient anal sphincter mechanism compromise the method and aggravatethe results of the treatment. In this case, the Rehn-Delorme's procedure should be applied. After the five-year result evaluation of the application of DG HAL-RAR with mucosectomy of the anal prolapse (9), we did not note neither any sign of relapse nor any disorder of the function of anal sphincter mechanism.



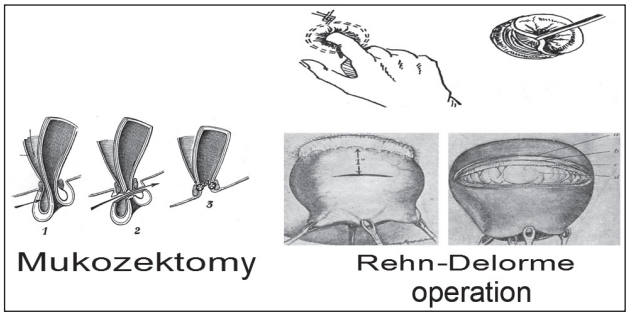
Picture 1. Anal prolapse with hemorrhoidal orgin (ante and postoperative)

Adulte prolapse

Four patients with adult prolapse were treated with mucopexy using DG HAL - RAR. This method gives excellent results because it fixes mobile mucus above the dentat so that it stops the prolapse. There are SECCA apparatus but we do not use it (9).

Anal prolapse –second degree

Rehn-Delorme's procedure was applied to two patients who had anorectal prolapse –second degree (up to 5 cm).

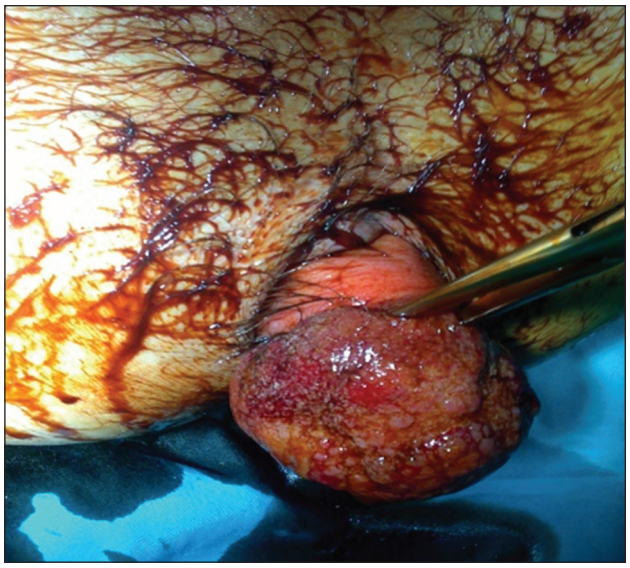


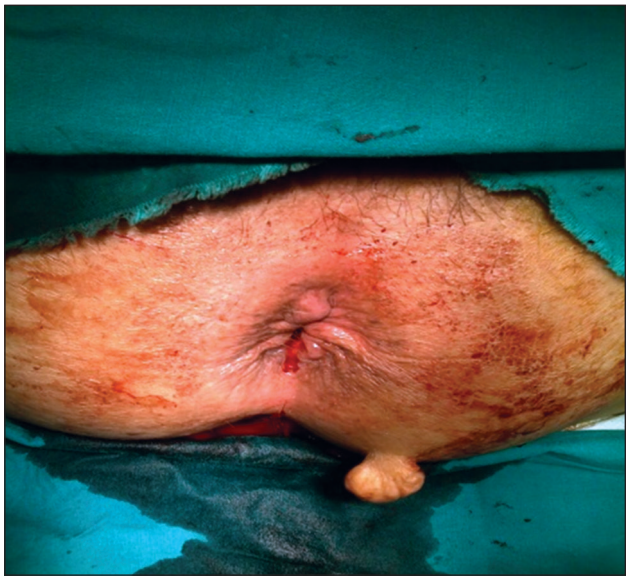
Picture 2. Anal prolapse – second degree

Chronic constipation forms the fecaloma which expands anal canal, lengthen it towards the outer side, which lengthen and weaken the structure of the vertex of external, middle and internal portion of sphincer.

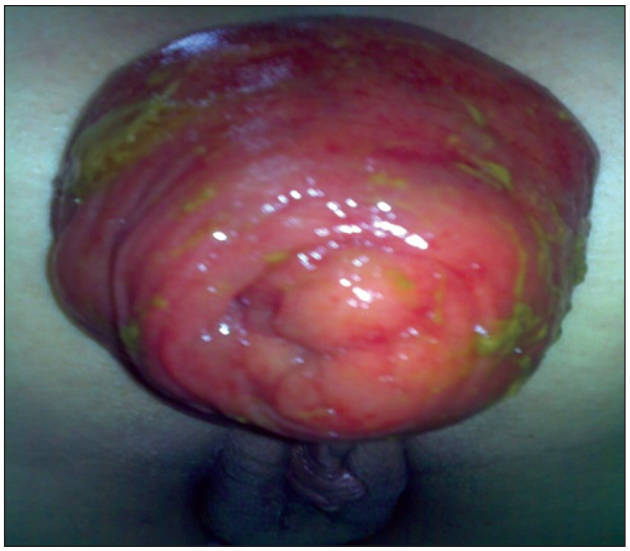
During the strain, a „protruding anus" is visible. Manuel extraction of the fecaloma makes additional damage. The aim of the Rehn-Delorme's procedure is to fix the separate elements of sphincter and repair damaged anatomy and disturbed function.

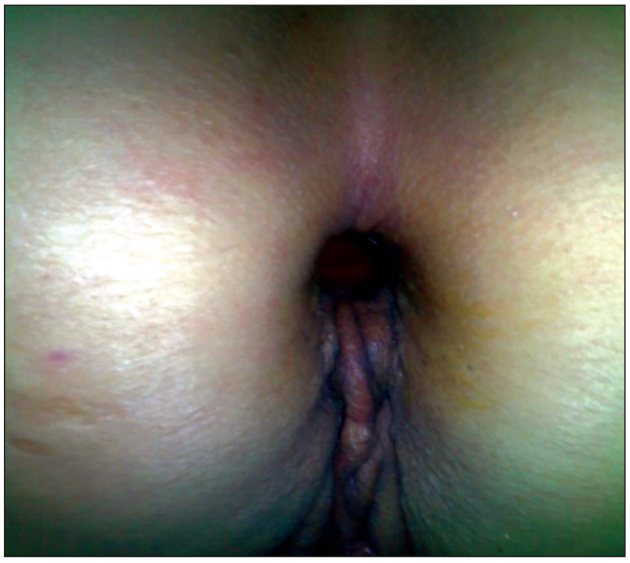
Extra anal resection (Altmeyer) was done in three patients with the anorectal prolapse (second degree) which was formed by prolapsed anorectal tumour (9).





Picture 3. Anal prolapse with rectal tumor (ante and postoperative)





Picture 4. Anal prolapse (thirth degre) – Proxidentio „Protruding anus“

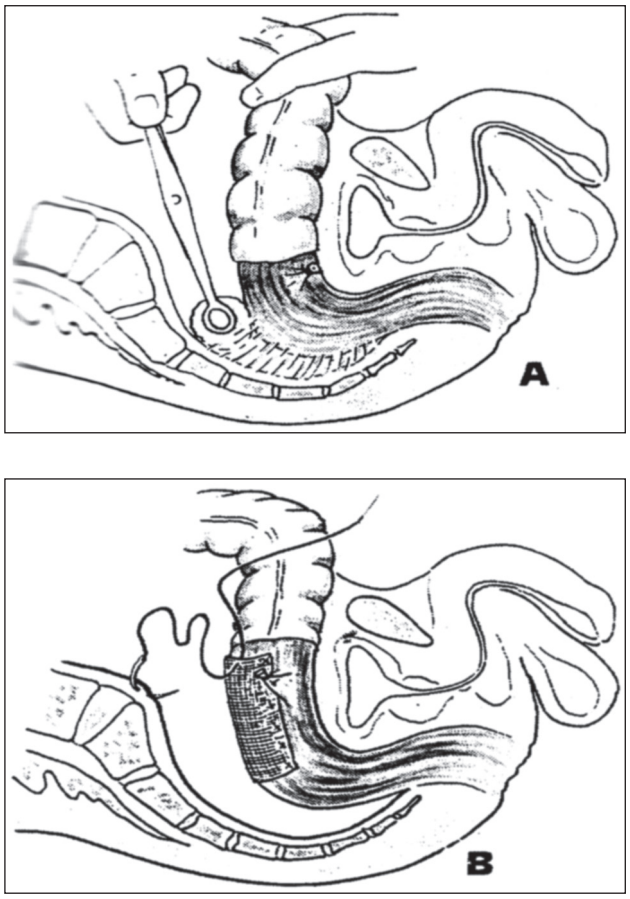
It is important to point out that in this procedure it is vital to save the last part of the rectum (4 to 6 cm) which contains the gentle zone for fart and stool detection, in order to save the continence. Palpative examination of preserved sphincter ring indicates this procedure. It is important to do a timely resection because every delay can damage the sphincter structure.

Anal prolapse (third degree)

The treatment of this kind of prolapse (the length of the prolapsed invaginated rectum is 10 cm or more than that) implies a very complex surgical procedure.

It demands the rising of the diaphragm by pelvis plication, fixation of the rectum to the sacrum, narrowing of the rectal and urogenital hiatus through pelvic diaphragm with the plication of anorectal sling m.puborectalis (II sphincter) (1,9).

Some additional methods for narrowing the anal canal are also needed (perineoplasty) and we do them very successfully in our institution. We pay special attention to the formation of the third sphincter (plication and high fixation of the sigmoid meso sigmoid colon). That kind of surgical treatment is successful in most cases. It brings back the patient as well as his family into a normal life.



Picture 5. Notaras plasty

Using transabdominal approach on the five patients with procidentia in the first act, the following procedures were undertaken: retroactive plication of levatore muscle, narrowing of hiatus recti by plication of puborectal muscle, i.e. forming the puborectal sling (II sphincter). Then, using the method of Notaras which we modificated, the net is applied (letter L). The vertical arm is fixed for promontorium and the horizontal is fixed under peritoneum on the pelvic floor forming rectal and urogenital hiatus.

By narrowing hiatus (puborectal and rectococcygeal loop) rectum is risen, forming the required arm. In order to form III sphincter which matches rectosigmoid passage, we apply the plication of meso sigmoid colon and high fixation of rectosigmoid passage under the duodenum which enables the required arm that will stop the fecal content until there is a required pressure which will surmount the newly-formed rectosigmoid passage.

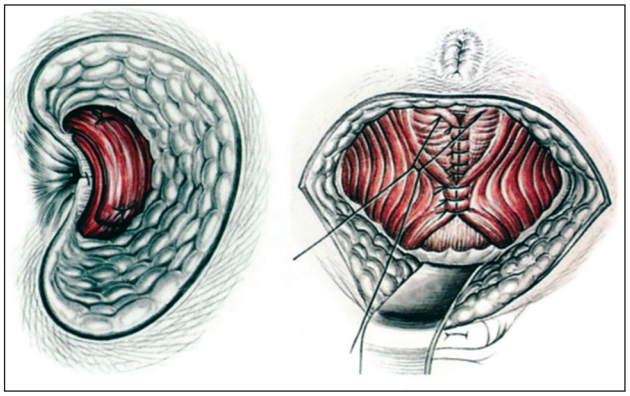
All results of this procedure are good because such a fixed rectosigmoid passage mechanically stops the direct pass of fecal content into the rectum imitating III sphincter. We close fibrously changed peritoneum in the hight of the promontorium which additionally stops the descensus of intestines into a small pelvis. There are some specially constructed biodesigned nets for the plastic repair of pelvic floor (9,19).

In the second act, we narrow the anal canal using front or back perineoplasty combined with dynamic gracilis plastic surgery as well as sphincteroplasty.This method gives the best results (2, 3, 4, 6, 7, 9 , 11, 13, 16, 17).

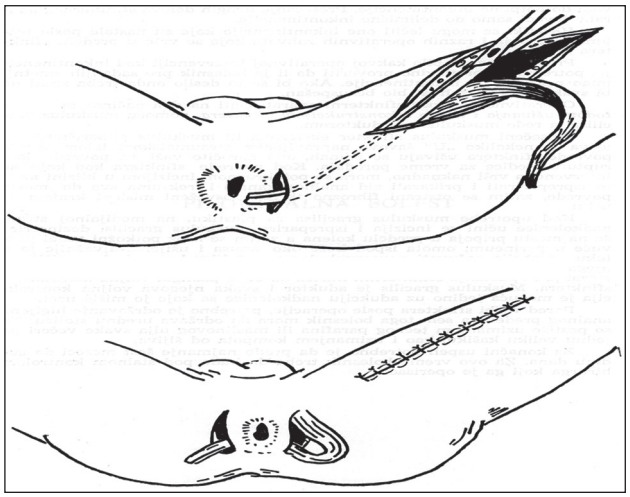
In emergency, two patients with gangrenous rectal prolapse underwent extra anal resection with perineoplasty. In extra anal rectal resection it is important to post the distal and proximal resection line 4 to 5 cm above the anal opening in order to protect the gentle zone of continency. At the same time it is important to do the perineoplasty 'from below', which means to lift it up to the normal or nearly normal position with an adequate puborectal sling and vaginal hiatus. In order to apply this procedure you have to check the integrity of the toroidal muscle. Preserved integrity of this muscle immediately leads to gangrenous prolapse. Within the three months after the intervention, three patients had signs of insufficient continence (flatus and liquid stool). After six months, all patients could control their normally formed stool, while most of them showed the signs of fecal urgency which was totally different from the incontinence before the intervention.

The patients were really satisfied. Distant results of the treatment were good.

One female patient with a huge enterovaginal prolapse with alvi et urinae incontinency underwent a two-act intervention. The first one was the one described as 'from above'. The other one is called „from below".

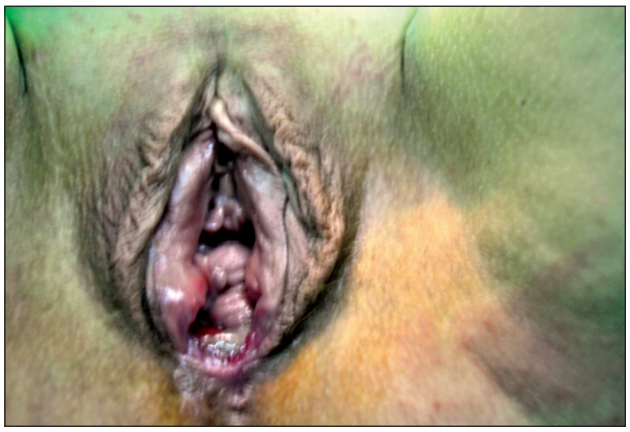


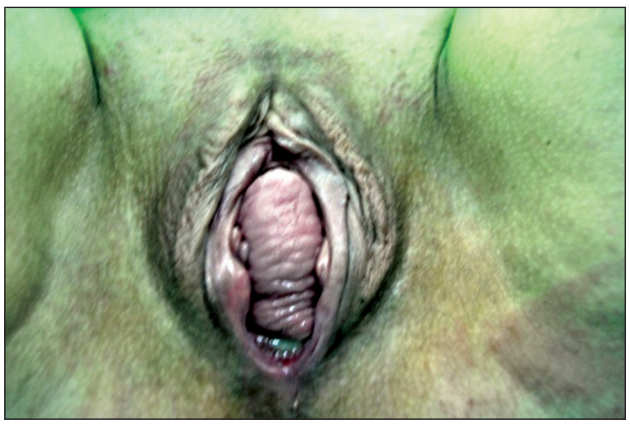
Picture 6. Perineoplasty

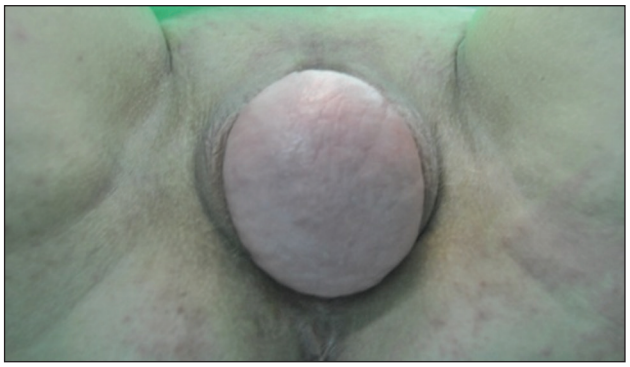


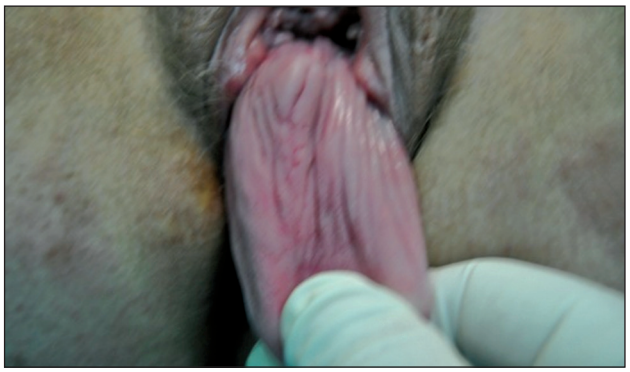
Picture 7. Gracilis plasty

The results were very good. After three months period, the control of the flatus was insufficient; control of the formed stool was very good. The control of urine was managed by frequent urinating. One female patient who suffered from anorectal prolapse caused by weak pelvic floor underwent 'from intervention because she was 81 below'.









Picture 8. Intestinovaginal prolapse

We make a cut up to the top of coccyx, 1.5cm away from the anal opening, and treat lig. puborectalis, rectal and urogenital hiatus, pelvic diaphragm and levators. Rectum is blutnly separated from the sacrum up to the promontorium. Then we place a net 20 x 10-15 cm retro-rectal, fixing it to the promontorium by three stitches to the rectum. Above the diaphragm, pelvic net curbs towards the front so we cut it vertically, forming its rectal and urogenital hiatus by widening the opening on the horizontal arm of the lengthways slitted net for rectum and uterus. The front approach prepares pelvic floor and the net is fixated by several stitches to the muscle in order to strenghten the pelvic floor. There is a widely open access to the pelvis. Then we prepare hiatus recti, puborectal sling which is narrowed at the front by a few stitches so that rectum is risen forward because it is fixed to the net. In that way we complete the reconstruction of the II rectal sphinter. In the vaginal-intestinal prolapse, it is neccessary to place the net at the front in order to form the opening urogenitalis in the same way like hiatus recti. Reconstruction of the voluntary sphincter is done by narrowing it using sphinteroplasty (in the case there are sphincter muscles) or forming neosphincter by dynamic graciloplasty or gluteoplasty (9).

Conclusion

Anorectal prolapse is a serious medical and social problem because of the complications caused by damaged anatomy and disturbed function of the pelvic floor and anorectal segment which must be surgically restored.

The success of the surgical treatment depends on the surgeon's experience who must be educated in the field of the coloprotological surgery.

People, especially ones who suffer from anorectal prolapse, must know that surgical treatment of this illness is very successful. If it is not treated surgically, it makes serious problems to the patients. Measures of prevention are crucial. Surgical treatment must be timely. Mucus anal, in most of the cases hemorrhoidal prolapse, is treated by DG HAL-RAR with mucosectomy. Poor sphincter function (in older patients) is treated by Rehnn Delorme operation.

Rectal prolapse caused by tumours is treated by Altemeier's method of transanal transection of all prolapsed rectum, paying attention to save required from 4 to 6 cm zone neccessary for the continency. Combined abdominal and perineal act are methods which can help the patient with procidentia.

By abdominal act, diaphragm pelvinum and hiatus recti get back to their physiological position. Fixation and suspension of the rectum is done by retro-rectal placement of the net. The aim of the perineal act is to narrow the insufficient anal canal by perineoplasty using dynamic gracilis or m. gluteus plastic surgery

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