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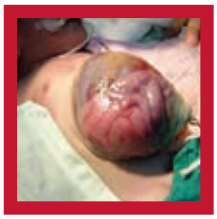

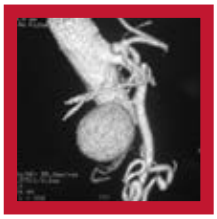

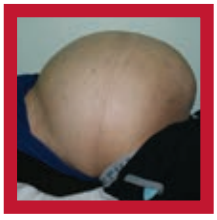

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Editor's Letter

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Thank you for your trust,

Editor in chief
Prof. Predrag Grubor

ORIGINAL ARTICLE

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Dental Anxiety in Children Aged 6-15 years

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ABSTRACT

Introduction: Dental anxiety and fear are the source of serious health problems in children. The prevalence of dental anxiety in children and adults widely ranges from 5-40%.

Aims of the study: The aim of this study was to determine the level of dental anxiety among school aged children and to point out these issues in school children, in order to get better understanding and management of treatment in these children, and take appropriate preventive measures.

Patients and Methods: The study was conducted on 70 children (42 males and 28 females) in age of 6-15 years, in „Health" Kneževo during period of March/April 2014. Children were divided into two groups according to their age. First group consisted of children aged 6-10, and the second one 11-15 years old. We studied the prevalence of dental anxiety, gender and age distribution, the degree of dental anxiety, and the impact of previous dental experience. The assessment of dental anxiety was obtained using Dental anxiety scale (DAS).

Results: Average DAS in children was 9.94. There was no statistically significant difference in the occurrence of dental anxiety in relation to sex and age of a child. In 18.57% of the children, severe dental anxiety was identified. Previous negative dental experience significantly affects the level of anxiety in children.

Conclusion: Dental anxiety is an actual and widespread problem. A negative dental experience has a great impact on the development of dental anxiety.

Key words: dental anxiety in children, the prevalence, negative dental experience

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Introduction

The major barriers for dental treatment in the pedriatic age are fear and anxiety, and if they are not eliminated in a short time, they can develop into dental phobia and, as a consequence, patients will avoid dental treatment. Fear and anxiety are recognized as a source of serious health problems in children.

Fear is the immediate response that falls within the sphere of emotional behavior, and the result is an emotional response to a real threat. The intensity of anxiety is stronger than fear. The difference is that it has unreal characteristics, its intensity and duration are amplified and can lead to a state of panic / phobia. Fear is formed and defined by the way children understand and accept reality, perception, danger and risk.

Fears in children vary based on acquiring knowledge, developing knowledge and experience. Dental anxiety is acquired at an early age (especially in adolescence) and is relatively common in children and adults.[1-3] As the main causes of its occurrence are: the lack of dental awareness, traumatic dental experience, dental trauma / injuries of teeth, the anxiety of parents, socioeconomic status, personality traits, and the influence of the environment and the media.[4] Research have shown that chronological age may have significant impact on the acceptance of dental treatment by a child.[5]

The high level of dental anxiety is proportional to poor oral health, that is, more dental pathology.[6] It has been proven that dental anxiety is clearly linked to the avoidance of dental treatment which has detrimental effects on oral health, and further enhances the expressiveness of dental fear, creating a vicious circle.

Available worldwide literature testifies that the prevalence of dental anxiety in children and adolescents varies widely from about 5% to 40%.[7-11] A possible reason for the large range in assessing the incidence lies in the way the phobia is defined. In fact, most authors report two key indicators: the feeling of extreme fear and behavioral response that is reflected in not visiting the dentist. Also, the techniques of measurement and definition of fear and avoidance of going to the dentist in the literature are very different. However, it should be noted that there is a fairly high correlation between the measurements of differently defined fears about dental and medical procedures according to the different questionnaires.

Until now, on the territory of the Republic of Srpska, a small number of scientific research which deal with the frequency of dental anxiety and the factors affecting it was pubished.

Aims of the study

The goal of this scientific research was to determine the prevalence of dental anxiety in school age children.

Patients and methods

The study included 70 children aged 6-15 years (average of 10.11 years) of both genders (42 boys and 28 girls), who visited the dental clinic PHI "Dom zdravlja" Kneževo in March and April 2014. The subjects were divided into two groups, the first group consisted of children aged 6-10 years (n = 32, 45.71%), and another group were children aged 11-15 years (n = 38, 54.29%). Children who had come alone (without parents), and children with diseases and disorders that could possibly hinder or completely disable cooperation were excluded from the research. The research was conducted with the approval of the Ethics Committee of the Institution. Written informed parents' consents were obtained.

The study was consisted of filling in the surveys immediately upon arrival of the patient in the dentist's office, or before performing dental treatment, in order to achieve maximum objectivity and avoid a potential impact of the intervention on the course of the response. The form contained the basic socio-demographic data, gender and age, as well as issues related to previous dental experience. Dental anxiety in children is measured by a shortened form of Korah dental anxiety scale (Corah Dental Anxiety Scale-CDAS) which was consisted of four questions, which were related to situations or actions that could have been encountered in practice. Answers are pre-structured and graded by a five-point Likert scale (1- without anxiety; 5-maximum level of anxiety). Thus, the total value of the results DAS ranged from 4-20. I other words, it was represented by the results: minimum 4 (no anxiety) and the maximum score 20 (very high anxiety). The results obtained were defined as follows: 4-7 normal, 8-11 mild anxiety, 12-16 moderate anxiety, and 17-20 severe anxiety. [12]

For statistical analysis we used software IBM SPSS Statistics 21.0. All results are presented in tables and graphs. Pearson-ov χ^2 contingency test was used to test the correlation between dental anxiety and factors such as gender, age and previous dental experience. To compare the mean values of the characteristics according to the different groups of subjects, the Mann-Whitney U-test for two independent samples was used. To determine the degree of correlation Spearman's correlation calculator was used. Values where $p < 0.05$ were considered statistically significant.

Results

The results showed that the average DAS in children was 9.94, and that there was no statistically significant difference in the DAS between boys and girls (Table 1.).

Table 1. Basic indicators of descriptive statistics for the DAS in children by gender of the child

DAS in child	Gender of child		All
	Male n (%)	Female n (%)	
Number of patients	42 (60%)	28 (40%)	70
Arithmetic mean	9,98	9,89	9,94
Mann-Whitney U test for indipendent samples			
p = 0,976			

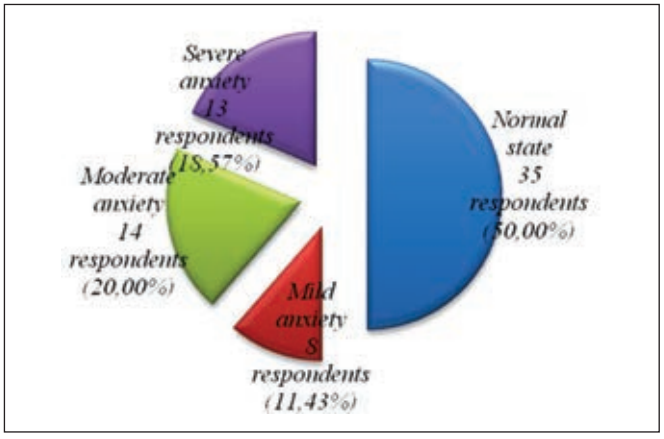
Average DAS in the first group of respondents was 10.47, while in the second group of respondents it was 9.50. However, the difference between the value of DAS groups was not statistically significant (Table 2.).

Table 2. **Key indicators of descriptive statisticsfor the DAS in child under the adge of the children**

DAS in child	Age of the children		
	6 to 10 years n (%)	11 to 15 years n (%)	All
Number of patients	32 (45,71%)	38 (54,29%)	70
Arithmetic mean	10,47	9,50	9,94
Mann-Whitney U test for indipendent samples			
p = 0,370			

Half of these children had a normal state of anxiety. 11.3% children had mild anxiety, 20% moderate, and 18.57% extremely severe anxiety (Figure 1.).

Figure 1. **Precentage of the respondents according to the level of anxiety of the child**



Pearson χ^2 test showed that there was no statistically significants difference in the level of anxiety among boys and girls (χ^2=0,260; p=0,967) and there was no statistically significant difference in the level of anxiety among younger and older children (χ^2=2,050; p=0,562). 41.43% of the examined children had a previous negative dental experience. There was a statistically significant effect of the previous negative dental experience on a higher level of anxiety in children. In fact, only one in four children with a normal state of anxiety or mild anxiety had a previous negative dental experience, while at the higher levels of anxiety, there was significantly increased proportion of children with a previous negative dental experience (Table 3).

Table 3. **Frequency and percentage of patients by level of anxiety of the child and previous negative dental experience child**

Anxiety level of children	Previous negative dental experience in children				
	No		Yes		All
	n	%	n	%	n
Normal state	27	77,14	8	22,86	35
Midle anxiety	6	75,00	2	25,00	8
Moderate anxiety	5	35,71	9	64,29	14
Severe anxiety	3	23,08	10	76,92	13

c2	df	p
15,629	3	0,001

Discussion

Dental anxiety is one of the reasons why children avoid dental appointments or show anxiety problems. Assessing the level of anxiety can be very useful for providing good quality of dental services and better management of the behavior of patients. In highly anxious patients, it may be necessary to administer more local anesthetic or even anxiolytic in the dental treatment. Therefore, the results of this study are valuable for better understanding, management and development of treatment strategies for these patients.

The study showed that DAS levels among kids was 9.94. The data showed that most respondents had normal anxiety.However, the total number of increased anxiety and abnormal subjects was equal to the number of normal anxiety. The prevelance of high dental anxiety in children was 18.57%, which was lower than results found in children from Iran (29.3%)[7] and Saudi Arabian (34%)[8] , but much higher than research results by Olak et al.(6%). [13] The study results must be interpreted with caution, because children's fear can exist even if the children do not report it, since it is often used as a defensive reaction term " I'm not afraid ". At the same time, an inadequacy of the responses given by the children may be due to insufficient differentiation of the psychological structure of each child and frequent inability to separate the real from unreal. In addition, highly anxious patients avoid going to the dentist, until the occurrence of particular problems. This study included patients who volunteered for dental treatment.

One of the most important factors for dental anxiety, which is mentioned by many researchers, is the child's age. The research results showed that there was no statistically significant difference in the prevalence of dental anxiety among children of different age groups. Thes results were similar to those found by Alaki and associates, which found no correlation between dental anxiety and children's

age[8]. In their 2007 study of children between ages 5 - 12, Bakarcic and associates found that there was a negative coorelation between age and higher measurement of dental and medical fear.[14] Our research was not in accordance to Majstorovic and associates 2004 study that noted lower percentage of dental phobi in boys (7.1%) and girls(9.2%) of older age , when compared to younger age(51.8% and 52.8%).[15] Many studies have shown a decrease of dental fear as children get older.[7,9,10,16,17] It is believed that in younger children, dental anxiety is part of a general anxiety. As they are growing up, they are able to control fear and anxiety to conceal the present existance of anxiety. In contrast to these findings, the study Raja et al.[18]showed that dental fear increased with age. The reason for these results could be found in a higher number of painful dental experiences and complicated treatment.

In this study, there was no statistically significant differences in the prevalence of dental anxiety between boys and girls, which was consistent with the findings obtained by Yang et al.[9] and Paryab et al.[7] A number of researchers found a higher prevalence of dental fear in females.[8,13,15,19] As a possible explanation, the authors offered cultural differences between males and females in expressing emotions. Males can not express their fears and anxieties as openly as females (girls freely show their feelings). The reason for contrast in our study may be the unequal distribution of the sample size between boys and girls. In addition, the gender balance among the different age groups was not equal.

Dental anxiety has a multifactorial origin, and, among external factors are previously negative dental experience significantly correlated with dental fear. 41.43% of the children in the study had negative dental experience, and with increased degree of anxiety , a percentage share of negative experiences grew. Hence, there was 76.02% of children with high dental anxiety. These results were in accordance with Brukiene et al. [20], which evaluated the relationship between dental anxiety and experiences of previous dental treatment and confirmed that adolescents without invasive dental treatment in the past were less anxious than those who had such an experience. Olak et al.[13] in his research also found a link between the previous negative dental experiences and dental fear. In contrast to these results, Lygidakis found no significant effect of previous dental and medical experience to dental fear and behavior of children in the dental office.[16] Negative dental experience is the greatest reason for dental anxiety but, the theory of "latent inhibition" suggests that a history of positive or neutral dental experience can serve as a protection from the development of a traumatic experience or anxiety.[21]

This study draws attention to a problem that has been neglected in modern dentistry and has a big impact on the success of dental treatment. This study has limitations, which are primarily reflected in the small number of subjects. In order to obtain more precise dana, more comprehensive study, which would include more subjects of different ages and gender, as well as from different living environments, is needed.

Conclusion

Dental anxiety is very real and widespread problem that must be resolved in order to provide adequate dental care. This study raises the need for greater awareness of dentists for "coaching" management of dental anxiety in patients, especially children. Consequently, proper management of dental anxiety in children would greatly reduce the difficulties in providing adequate dental care.

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Dentalna anksioznost kod djece uzrasta 6-15 godina

SAŽETAK

Uvod: Dentalna tjeskoba i strah su izvor ozbiljnih zdravstvenih problema kod djece. Prevalenca dentalne anksioznosti kod djece i odraslih dosta varira (5-40%).

Cilj rada: Utvrditi učestalost dentalne anksioznosti kod djece školskog uzrasta, radi boljeg razumijevanja i upravljanja tretmanom kod ovakve djece, te preduzimanja odgovarajućih preventivnih mjera.

Ispitanici i metode: Istraživanje je uključilo 70 djece (42 dječaka i 28 djevojčica), u dobi 6-15 godina, koja su posjetila stomatološku ordinaciju Doma zdravlja Kneževo tokom marta i aprila 2014. godine. Ispitanici su svrstani u dvije grupe, uzrast 6-10 godina i uzrast 11-15 godina. Ispitivana je prevalenca dentalne anksioznosti, polna i starosna distribucija, stepen dentalne ankioznosti, te uticaj prethodnog stomatološkog iskustva. Za procjenu dentalne anksioznosti je korištena Skala dentalne anksioznosti (DAS- Dental anxiety Scale).

Rezultati: Prosječan DAS kod djece je iznosio 9.94. Nije uočena statistički značajna razlika u javljanju dentalne anksioznosti u odnosu na pol i starost djeteta. Kod 18.57% djece je utvrđena teška dentalna anksioznost. Prethodno negativno stomatološko iskustvo značajno utiče na stepen anksioznosti kod djece.

Zaključak: Dentalna anksioznost je vrlo stvaran i rasprostranjen problem, a negativno stomatološko iskustvo ima veliki uticaj na njen razvoj.

Ključne riječi: dentalna anksioznost kod djece, prevalenca, negativno stomatološko iskustvo.

ORIGINAL ARTICLE

UDK 616.31-056.34-056.2(497.6 Banja Luka)

Oral Health in Children with Intellectual Disabilities in Banja Luka Municipality

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ABSTRACT

Introduction: Dental care for people with mental disabilities is an integral part of the comprehensive medical care. Mentally challenged people, in addition to mental have, in cases of severe psychophysical development disorders, motor disturbances as well, which prevent them from adequately maintaining oral hygiene and general health. In institutions where these people are located, there is often no dental service or dentist to take care of their oral health.

Aims of the study: The basic goal of the reasearch is to determine the oral health condition of the intelectually disabled children in the municipality of Banja Luka.

Patients and Methods: The study was conducted on 65 children (26 females and 39 males), age range: 5 to 15 years old. According to a type of disability by 10th International classificiation of the diseases, children were divided into two groups: group 1/F71(n=35) and group 2/F72 (n=30). Dental check assessed: teeth number, presence of decayed, missing/extracted teeth and radices relictae, presence and number of crowns, gingival index-GI and plaque index-PI.

Results: The analysis showed there was no significant difference in the number of decayed, extracted, filled teeth and there were no significant differences in the values of DMFT, gingival and plaque index.

Conclusion: Children with mental disabilities in the municipality of Banja Luka have a bad state of the mouth and teeth. In relation to the degree of mental disability of children, there was no significant difference in the number of decayed, extracted, filled teeth, DMFT, gingival and plaque index .

Key words:
children with mental disabilities, tooth decay, DMFT

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Introduction

Oral health, as an integral part of general health and wellbeing of a human,[1] has a great influence on everyday functioning and life quality of intellectually disabled people which are in general additionally worsened by diseases of other systems and organs.[2] There is a continuous increase in number of intellectually disabled people, which is contrary to the development degree of health protection.

Nevertheless, the development of medical science today significantly influences the prolongation of lifespan of such people, although the insufficient attention is paid to their oral health. Reasons for bad oral health of such people are numerous and complex. Namely, intellectually disabled people are most often accommodated in special institutions and rarely in households. In such special institutions there is often no dental service, i.e. dentist to take care of their oral health.[1] With such people who live with their perents or legal guardians, the oral care is taken by their parents, i.e. guardians who usually do not cooperate properly with the dentist and are not correctly informed about the importance of oral health preservation.

Oral hygiene of intellectually disabled people is worse than the one of healthy people and they suffer from more developed paradontium diseases than healthy people. Being occupied by primary mental disease and ignorant of the importance of dental health, parents or guardians are usually insignificantly motivated to preserve the oral health of intellectually disabled children. Such people have aggravated cooperation with dentists and there are also not many dentists who work with intellectually disabled children. Low level of oral hygiene, great caries and paradontal diseases prevalence are characteristic of intellectually disabled people. Such people almost always maintain the oral hygiene insufficently, as they are not capable of learning nor understanding the importance of oral hygiene practice.[3] Special courses and other educational tools are necessary for the nursers in order to enable them to understand the importance of oral health and to manage the correct techniques of oral hygine practice.[4,5]

Health and educational work referring to oral health of intellectually disabled people should be an integral part of their primary disease treatment, i.e. should be within the already prescribed terapy in order to improve the overall quality of their life. [6,7]

Damaged oral health is additionaly aggravating the nutrition and communication with such patients.[8] Furthermore, such patients often take numeruos medicines which can also influence the oral helath (reduce salivation, cause gum infection, lead to bone resorption and to parodonthopy). Taking of analgetics can also hide certain disease symptoms in these patients. [9]

Hypersalvation leads to reduction in salivary activity of cleaning thus having a dental plaque accumulate in marginal gingival area. The consequences of hypersalvation are inadequately puffered acids produced by increasing number of bacteria, which, in the end, cause teeth decay.[10]

Most of these people are often either teethless or with few teeth, suffering from extensive acute caries, high KEP index and developed periodontium diseases.[11]

Dental care of intellectually disabled people represents the biggest problem, as well as challange for the dentist. It is very important for the dentist to win their sympathy, i.e. to establish friendly relationship. Intellectually disabled people are hyperactive and upset while being at the dentist, they have unpredicted emotional reaction and attention shortage. [12]

Noninvasive dental interventions, such as machine-used removal of soft layers, tartar or local fluoride application can be made in high percentage of intellectually disabled children at the dental clinic.[13]

Regarding intellectually disabled children of younger age who do not accept cooperation, a short dental intervention can be made with the help of parent or guardian having a child in their lap with their legs over the legs of the child and fixing the arms and body of the child with their hands. In this way, a dental check-up can be made together with some preventive measures, drainage or tooth extraction. With intellectually disabled children of older age, the presence of parents/guardians is requested, i.e. the presence of the person who brought the patient, so that he/she could prevent the possible violent behaviour of the patient.[14]

In cases when it is impossible to provide conventional dental treatment, sadation or general . anesthesia is used. There are few publications on oral health of intellectually disabled people in the world and especially in our country.

Aims of the study

The basic goal of the reasearch is to determine the oral health condition of the intelectually disabled children in Banja Luka municipality.

Patients and Methods

This research involved 65 intellectually disabled respondents, out of which 26 were females(40%) and 39 male (60%), at the age of 5 - 15 years, i.e. average age 10 years. The research comprised children living with parents/ guardians and children accommodated with the following institutions: PI Centre "Zaštiti me" and Institution of physical medicine and rehabilitation "Dr Miroslav Zotović" Banjaluka. The respondents were divided into two groups according to the level of the intellectual disability as defined by the 10th audit of the International disease classification (MKB-10). There were 35 respondents with F71-diagnosis - moderate intelectual disability and 30 respondents with the diagnosis F72- severe intellectual disability. Their teeth condition was examined and determined at the Maxiofacial Surgery Clinic of the Clinical Centar Banja Luka and the teeth treatment was conducted in the period between January 1st, 2012 and December 31st, 2012.

A dental mirror, a probe and artificial light were used in the dental examination, as recommended by the World Health

Organisation. Upon the dental examination, the dental record was filled in

(number of teeth, caries presence, existing fillings, number of extracted teeth, remained teeth radices relica, possible presence of dental prostheses).

KEP index was used in the estimation of teeth condition. All parents/guardians were familiar with the purpose of the reasearch and confirmed by their signatures thier participation in the research.

Löe and Silnes gingival index was used for the estimation of the gingiva condition and the dental plaque presence was also established using the Silnes oe.

All the data were processed using standard procedures of descriptive and comparative statistics. Within the descriptive statitics, the average value was determined as well as standard deviation, and within the comparative statitics: Kruskal-Wallis test, Student test and χ^2 –test.

Results

The analysis showed that there was no significant difference in the number of caries affected, extracted or filled teeth, in comparison to the level of intellectual disability of the children. The average value of the caries affected teeth in children with mild intellectual disability amounted to 8.5 , whereas, in the case of shildren with more severe intellectual disability, it amounted to 8.7. The average value of the extracted teeth in children with mild intellectual disability amounted to 0.3 , whereas in children with severe intellectual disability, it amounted to 0.4. The average value of the filled teeth in children with mild intellectual disability amounted to 0.25 , whereas in children with severe intellectaual disability, it amounted to 0.17.

On the basis of the conducted Student test there was no statistically significant difference in the number of caries affected, extracted and filled teeth in relation to the level of intellectual disability in children (Table 1.).

Table 1. Results DMFT index in relation to the degree of mental disability of children

	Degree of mental disability	N	$\bar{x}$	SD
Decayed	deminished	36	8.472	4.266
	weighs	29	8.759	5.138
Extracted	deminished	36	.306	.856
	weighs	29	.448	1.021
Filled	deminished	36	.250	.770
	weighs	29	.172	.658
DMFT	deminished	36	9.028	4.253
	Weighs	29	9.379	5.596
	deminished	36	9.028	4.235

There was no significant difference in KEP values in children with different level of intellectual disability. Regarding the children with mild intellectual disability, the average value of KEP amounted to 9 whereas in those having severe intellectual disability, it amounted to 9.4.

There was no statistically significant difference in KEP values in relation to the level of intellectual disability as shown by conducted Student test (Table 1.).

The results showed that the respondants with severe intellectual disability had higher average value of Caries tooth index (KIz-a) (40) than those with mild intellectual disability who had their average value KIz-a (35). This difference was not statistically significant($t = 1.009$; $p < 0.317$) (Table 2.).

Table 2. Value PCC in children respondents in relation to the degree of disability

		KIz					
		N	$\bar{x}$	SD	Med	Min	Maks
Degree of mental disability	weighs	29	40.55	23.92	32.00	11.54	96.43
	deminished	36	35.42	17.04	35.10	12.50	87.50
	total	65	37.71	20.39	32.00	11.54	96.43

The average value of gingival index in children with mild intellectual disability amounted to 1.2±0.6 whereas in children with severe intellectual disability, it amounted to 1.4±0.6. The average value of plaque index in children with mild intellectual disability amounted to 1.8±0.5 whereas in children with severe intellectual disability, it amounted to 1.9±0.7.

Figure 1. Gingival index of children in relation to the degree of mental disabilities

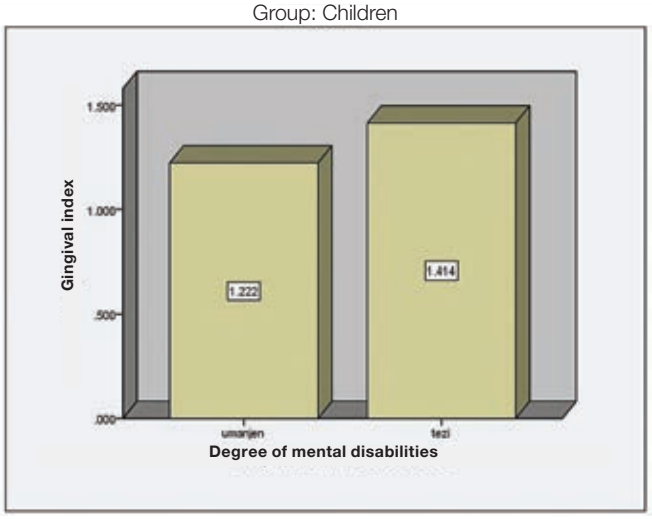

Figure 2. The plaque index of children in relation to the degree of mental disability

According to the Student's t -test there was no statistically significant difference in the values of gingival and plaque index in the children groups in relation to the level of their intellectual disability.

Discussion

The results of this research showes that children with severe intellectual disability had more caries affected and extracted teeth as well as higher average KEP values, but there was no statistically significant difference in the number of extracted, filled and caries affected teeth in relation to their level of intellectual disability.

The study conducted in Turkey by Altun and his coworkers showed that the level of oral hygiene practice significantly worsened with the age and that KEP was increasing. Namely, having examined 160 schoolage children with intellectual disabiilty, they found out that the average KEP value in children up to six (6) years was 2,04, in chidren up to 12 years 2,24, and with those up to 26 years even 11,9, which was in accordance with our results and was explained by inadequate oral hygiene and longer presence of teeth plaque.[15]

Long stay at home combined with consumption of nibbles and sweetened drinks influenced increased caries occurance.[16] Butts" findings show that only 17% of intellectually disabled children who lived at home had no caries, whereas 38% of those accommodated with institutions had healthy teeth. The reasons for this were consumptions of nibbles and sweetened drinks while at home, as well as irregular teeth brushing.[17] Research conducted by Cutreess confirmed our results.[18]

In her research, Jovicic found out that there was no statistically significant difference between the condition of milk teeth of health and intellectually disabled children at the age 3-6 years, i.e. between different groups of intellectually disabled children. The condition of periodontium was much worse in children affected by celebral paralysis and those intellectually disabled than in healthy children.[19]

The research conducted in Croatia focused on the estimation of health condition of mouth cavity and teeth with intellectually disabled children and those helathy ones. The average KEP index value with intellectually disabled children amounted to 1,41 for mixed dentition and 6,39 for permanent dentition. Regarding healthy children, these values amounted to 1,23 for mixed dentition and 4,76 for permanent dentition. The results did not show statistically significant difference in caries intensity in different researched groups. Intellectually disabled children showed significantly worse oral hygine practice than healthy children. [20]

In their research conducted in Srbija, Gajić and Stevanović concluded that that there was statistically significant percentage of untreated milk teeth caries in intellectually disabled children in relation to the controlled group of helathy children. Intellectually disabled children also showed increased prevalence of paradontal diseases, especially those accommodated with social institutions. There was also a big difference in KEP structure with intellectually disabled people, i.e. much lower percentage of filled teeth and much more caries affected teeth. [21]

The research conducted by Kocic and his coworkers was contrary to the aforementioned. According to Kocic, the greatest milk teeth caries prevalence was noticed in children with mild intellectual disability, then in physically disabled children and the lowest caries prevalence was noticed in children with severe intellectual disability whose milk teeth were in the best health. It was further found out that there was no difference in the average number of damaged permanent teeth upon examined child at the age of 7-8 years, among physically disabled children (KIp=5,1), children with mild intellectual disability (KIp=5,6) and group of healthy children (KIp=5,7). [22]

The obtained results showed that that children with severe intellectual disability had more plaque and higher gingival index in relation to children with mild intellectual disability. However, this difference was not statistically significant.

Most authors agree with the conclusion that the oral hygiene condition of intellectually disabled people is geeting worse with age. Inadequate oral hygine leads to dental plaque occurance. The longer it exists, it causes more serious diseases of hard, as well as soft tissues.[23-26]

Lack of oral hygiene can be caused by ignorance of nurses and other personnel working in institutions which accommodate intellectually disabled people.[27,28] However, there is no reason to suspect that these people are

neglected by personnel. The fact is that the personnel do not have sufficient knowledge and education on how to treat intellectually disabled people and how to offer them the most adequate dental service in sense of adequate and correct oral hygine. [29,30]

The education was provided during the first control which was scheduled seven days after an intervention carried out in general anesthesia. Within this reasearch the education by means of lectures and brochures on correct oral hygine and its importance was provided to people taking care of intellectually disabled ones. It was noticed that it came to much better cooperation, especially in people with mild intellectual disability. This small, but important step in communication is ascribed to positive experience during mouth and teeth treatment in general anesthesia.

The available literature on this topic suggests that efficient instructions for oral cavity hygiene maintenance should actively include psychiatric patients. Furthermore, it points out the necessity for specific preventive dental programmes with the aim to improve behaviour of this population regarding oral health protection. Klark [31] however states that each preventive programme for improvement of oral health designed for healthy population requires significant changes in order to be adapted to the needs of this specific group of patients.

Researches point out that there are many intellectually disabled children who are not capable of oral hygine maintenance, and parents or guardians are usually unmotivated and uneducated. It is therefore very important to include parents/guardians as well as teachers in oral hygiene practice programmes designed for intellectually disabled people, so that they could successfully implement the prevention programme together with dentists. Health and educational work is a longterm and painstaking process with the aim not only to teach these people, but to prepare them to use this knowledge.[32]

Conclusion

Intellectually disabled children from Banja Luka municipality have bad mouth and teeth condition, but in realation to the level of intellectual disability, there was no significant difference in the number of caries affected, extracted and filled teeth, as well as in KEP, Kiz, gingival and plaque index.

Health and educational work in necessary as an integral part of terapy within the treatment of intellectually disabled people, and it should also include parents/ guardians.

Various education modes, trainings on oral hygine practice, prevention measures and improvement of general health consciousness in all segments of the society could contribute to higher quality life of intellectually disabled people.

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Oralno zdravlje djece ometene u mentalnom razvoju na području opštine Banja Luka

SAŽETAK

Uvod: Stomatološko zbrinjavanje mentalno ometenih osoba je sastavni dio sveobuhvatnog medicinskog zbrinjavanja. Mentalno ometene osobe, pored mentalnih imaju, u slučajevima težeg poremećaja psihofizičkog razvoja, i poremećaje motorike, koji im onemogućavaju adekvatno održavanje oralne higijene i zdravlja uopšte.U ustanovama gdje su ove osobe smještene, često ne postoji stomatološka služba, odnosno stomatolog koji bi brinuo o njihovom oralnom zdravlju.

Cilj rada: Osnovni cilj istraživanja je da se utvrdi stanje oralnog zdravlja djece ometene u mentalnom razvoju na području opštine Banja Luka.

Ispitanici i metode: Ispitvanjem je obuhvaćeno 65 ispitanika (26 ženskog i 39 muškog pola), starosti od 5 do 15 godina. Ispitanici su svrstani u dvije grupe prema stepenu mentalnog oštećenja: MKB-10: grupa 1/F71(n=35) i grupa 2/ F72 (n=30). Stomatološkim pregledom su utvrđeni: broj zuba, prisutnost karijesa, prisutnost ispuna, broj izvađenih zuba, prisutnost zaostalih korjenova, fraktura, kao i prisutnost i broj fiksnih nadoknada, te gingivalni i plak indeks.

Rezultati: Analizom dobijenih podataka uočeno je da nema statističke razlike u broju karioznih, izvađenih i plombiranih zuba između grupa, kao ni u vrijednostima KEP-a, gingivalnog i plak indeksa.

Zaključak: Djeca ometena u mentalnom razvoju na području opštine Banjaluka imaju loše stanje usta i zuba. U odnosu na stepen mentalne ometenosti djece nije bilo značajne razlike u broju karioznih,ekstrahovanih, plombiranih zuba, kao ni u KEP, gingivalnom i plak indeksu.

Ključne riječi: djeca ometena u mentalnom razvoju, karijes, KEP

ORIGINAL ARTICLE

UDK 613.2:612.118(497.6 RS)

Distribution of Clinically Relevant Erythrocyte Antigens among Blood Donors of the Republic of Srpska

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ABSTRACT

Introduction: Identifying voluntary blood donors with rare phenotype characteristics is the basic precondition for creating a registry of blood donors with rare blood groups.

Aims of the study: Determining the presence of phenotypes in the clinically most relevant blood group systems in regular blood donors at the Institute for Transfusion Medicine of the Republic of Srpska, with the goal to create a national registry of blood donors with rare blood groups.

Patients and Methods: Determination of antigens in the Rh system was performed by the automatic microplate method, as well as by gel method. Determination of antigens in other blood group systems Kell, Kidd, Duffy, MNS, Lewis and Lutheran was performed by the gel method and test tube method. Altogether 384 blood donors were screened between 2012 and 2013.

Results: The analysis of Rh phenotypes showed that most of the examinees had the Rh phenotype CcDee ,29.7% and 26.0% the ccddee, and the least of them had the Rh phenotype ccddEe 0.8%, Ccddee 1.6% and ccDee 2.3%. The antigen Cw was proved to be in 13 donors (3.4%), while the antigen P1 was detected in 291 donors (75.8%). In analyzing the Lewis antigen system, most of the blood donors were found to have the phenotype Le (a-b+), 74.0%. By analyzing the Lutheran antigen system, the phenotype Lu (a-b+) was detected in most of the donors typed for Lutherean antigens, that is, in 93.0% of them. One individual was found to have the phenotype Lu (a+b-) (0.3%), and two donors the phenotype Lu (a-b-) (0.5%). The analysis of the Kell antigen system showed most of the donors were of the phenotype kk, 93.2%, one individual was found to have the phenotype KK (0.3%) and 25 donors the phenotype Kk (6.5%). In analyzing the Kidd antigen system, most of the donors were found to have the phenotype Jk(a+b+), 46.6% and 29.4% the Jk(a-b+), whereas 24.0% had the phenotype Jk(a+b-). According to the study of MN antigen in the MNS system, most of the donors were typed as MN, 50.0% and 33.9% as MM, while the phenotype NN was detected in 16.1% donors. Analyzing the S and s antigens in the MNS system, the phenotypes Ss were found in most of the donors, 49.0% and ss in 43.2%, whereas the phenotype SS was detected in 7.8% donors. The analysis of the Duffy antigen system showed most of the donors were of the phenotype Fy(a+b+), 46.6% and 34.6% of the Fy(a-b+), while the phenotype Fy(a+b-) was observed in 18.8% donors.

Conclusion: Data on the distribution of clinically relevant erythrocyte antigens among regular blood donors in the Republic of Srpska is in accordance with the data set out in the literature for the caucasian.

Key Words: blood groups, erythrocyte antigens, distribution of clinically relevant erythrocyte antigens

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Introduction

Blood groups are every variation or polymorphism in blood. According to the general definition, blood groups are inherited biological characteristics that, in healthy people, do not change throughout life. According to another definition, blood groups are antigens on the surface of red blood cells, which represent inherited characteristics of every individual and may be proved by specific antibodies, and they express refined structural difference in the erythrocyte cell membrane.[1]

In practice, the term blood group refers to antigens. Immunohematology is a branch that studies erythrocyte antigen-antibody reactions.

Erythrocyte antigen can be divided according to: a) the clinical significance (they may cause hemolytic disease of the newborn or hemolytic transfusion reaction); b) the way of provoking immune response in the organism (exposure to similar antigens in the environment, when the so called natural antibodies are produced or immune response is stimulated by transfusion and pregnancy, respectively; when immune antibodies are produced); c) similarities in the biochemical structure. [1-5]

All the proved blood group antigens have been divided into: systems (at this moment we know about 35 of them), collections (there are 7 of them), and series (there are 2). [3]

Blood group antigens are classified into systems or collections, as they are defined immunologically, genetically and biochemically. In practice, first an anti-erythrocyte antibody is detected in the serum of a multigravida or politransfused patient. When its unique specificity is verified, the antibody is used for conducting researches of biochemical features and structure of antigens against which it was produced. Inheritance of the antigen and its genetic frequency are studied due to potential connection with the other, already detected antigens. Every antigen that belongs to any blood group system is presented by a six-digit number. The first three numbers mark the system (001-035), collection (205-213) or series (low-frequency antigens 700, and high-frequency antigens 901), whereas the other three numbers refer to the specificity of a certain antigen. For example, the Lutheran system is numbered 005, and the antigen Lu^a, as the first antigen of this system, has the number 001, i.e. 005001.

The clinically relevant erythrocyte antigens are, by definition, those that may cause erythrocyte hemolysis *in vivo*, when symptoms and signs of direct, i.e. delayed hemolytic transfusion reaction or clinical picture of the hemolytic disease of the newborn occur. The antigen systems Rh, Kell, Kidd, Duffy, MNS, etc. are considered to be clinically relevant erythrocyte antigens.[4] Distribution of erythrocyte antigens was tested in various races and populations. The results of those tests indicate that there are differences in the distribution of some erythrocyte antigens among different races, as well as within certain nations of the same race.

Aim of the study

To determine the distribution of clinically relevant erythrocyte antigens C, c, E, e, C^w, K, k, Kp^a, Kp^b, M, N, S, s, Fy^a, Fy^b, Jk^a, Jk^b, Lu^a, Lu^b, as well as the antigens P_1, Le^a and Le^b in the population of regular blood donors on the territory of Banja Luka and the Republic of Srpska.

To compare the found frequencies of the distribution of erythrocyte antigens with the frequencies in other tested white populations.

Patients and Methods

In this prospective study a total of 384 examinees were studied during 2012 and 2013, the population of regular blood donors at the Institute for Transfusion Medicine Banja Luka, males and females, the age of 18 through 55, with the blood groups A and O, RhD-positive and RhD-negative. Blood donors of the blood group A b were tested, as that was the most common blood group in this climate, as well as the blood group O, as those were regarded as „universal" erythrocyte donors (Table 1.).

The examinees belonged to the category of regular blood donors, who gave their blood at least twice before the screening, and their results upon the testing of presence of the markers for transfusion transmissible diseases had been

Table 1. Distribution of blood donors by blood transfusion centers at the Institute for Transfusion Medicine Banja Luka in 2013

2013	BL	DO	PR	GR	BN	ZV	TR	KS	FO	NE	TOTAL
Number of taken doses of blood	10114	4830	2327	2583	4078	2074	1690	1524	1332	50	30602
Number of voluntary blood donors	5710	2541	1820	1824	3460	1014	1712	642	373	50	19146
	57%	53%	78%	71%	73%	40%	99%	42%	28%	100%	64,04%
Number of women	1595	236	407	264	543	160	163	120	86	6	3580
	16%	5%	17%	10%	11%	6%	9%	8%	7%	9%	9, 88%

negative. In 2013, there were 5710 blood donors in Banja Luka, covering 7% of the total number of blood donors on this territory.

The frequency of the clinically most relevant erythrocyte antigens was studied in this sample, including implicitly Rh phenotypes, C, c, E, e, also including the C^w antigen, K, k, Kp^a and Kp^b antigens in the Kell system, M, N, S, and s antigens in the MNS system, Fy^a and Fy^b antigens in the Duffy system, Jk^a and Jk^b antigens within the Kidd system, Lu^a and Lu^b of the Lutheran system, as well as Le^a and Le^b antigens of the Lewis system and P_1 antigen. Blood samples were taken in the appropriate vacutainer with anticoagulant EDTA, as prescribed on the Techno device instructions.

To determine the blood groups and red blood cell/erythrocyte antigen typing, the following methods were applied: a) test tube method or agglutination in an aqueous environment, [6-8] b) gel method, [9] c) microplate method. [10, 11]

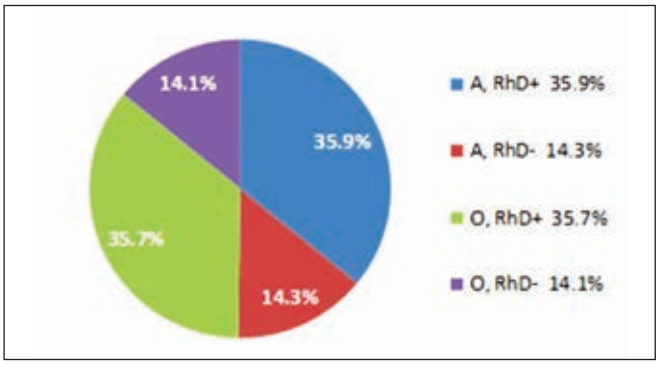
In this study. the process implied automatic testing of blood groups ABO and RhD antigens, as well as Rh phenotypes from donors' samples in the Techno device (DiaMed) [12], by microplate method, and gel method, test serums DiaMed. In this way we had electronic entry in the Lira reader and any error in copying was avoided. As for the determining of other blood group systems, the first time it was performed by gel method (DiaMed), and the second time by test tube method, by using the serum Biognost Zagreb, Novaclone Canada, Sanguin Holand, Immucor USA, Diagast France.

The primarily obtained data was analyzed by descriptive statistic methods. As descriptive statistic method the following was used: central tendency measures (arithmetic environment), variability measures (standard deviation) and structure indicators expressed in percentages.

Results

In the tested sample the highest percentage of blood donors were those of group A, RhD+ 35.9% (Figure 1.).

Figure 1. Distribution of blood groups in relation to the ABO system and RhD antigen



Analysis of **Rh phenotypes** in the tested sample of blood donors showed that most of the examinees were found to have the Rh phenotype CcDee ,29.7% and 26.0% the ccddee, and that the least of them had the Rh phenotype ccddEe 0.8%, Ccddee 1.6% and ccDee 2.3%. (Table 2.).

Table 2. Frequency of Rh phenotypes in the sample of blood donors in the Republic of Srpska

Rh fenotip	n (%)
CcDEe	45(11.7)
ccDEe	36 (9.4)
CcDee	114 (29.7)
ccDEE	8 (2.1)
ccddee	100 (26.0)
CCDee	63 (16.4)
ccDee	9 (2.3)
ccddEe	3 (0.8)
Ccddee	6 (1.6)
Total	384 (100.0)

In the tested sample of blood donors. the antigen **C^w** was verified in 13 of them (3.4%).

In the tested sample of blood donors the antigen **P_1** was detected in 291 of them (75.8%).

After analyzing the **Lewis** antigen system in the tested sample of blood donors, most of the blood donors were found to have the phenotype Le(a-b+), 74.0%.

By analyzing the **Lutheran** antigen system in the tested sample of donors, the phenotype Lu(a-b+) was detected in most of the donors typed for Lutheran antigens, in 93.0%. One individual was found to have the phenotype Lu (a+b-) (0.3%), and two donors the phenotype Lu(a-b-) (0.5%).

The analysis of the **Kell** antigen system in the tested sample of blood donors showed that most of the donors had the phenotype kk, 93.2% of them, one individual was found to have the phenotype KK (0.3%) and 25 donors the phenotype Kk (6.5%).

In analyzing the **Kp** antigen in the Kell system in the tested sample of blood donors, the phenotype Kp(a-b+) was detected in most of the examinees, in 97.9% of them, whereas the phenotype Kp(a+b+) was observed in 8 donors (2.1%).

The analysis of the **Kidd** antigen system in the tested sample of blood donors showed that most of the had the phenotype Jk(a+b+), 46.6% and 29.4% the phenotype Jk(a-b+), whereas the phenotype Jk(a+b-) was observed in 24.0% donors (Table 3.).

Table 3. Distribution of the Kidd antigen system in the sample of blood donors in the Republic of Srpska

Antigen system Kidd	n (%)
Jk(a+b+)	179 (46.6)
Jk(a+b-)	92 (24.0)
Jk(a-b+)	113 (29.4)
Jk(a-b-)	0 (0.0)
Total	384 (100.0)

By studying the **MN** antigen in the **MNS** system, in the tested sample of blood donors, most of the donors were typed as MN, 50.0% and 33.9% as MM, while the phenotype NN was detected in 16.1% donors. (Table 4.).

Table 4. Distribution of the MNS antigen system in the sample of blood donors in the Republic of Srpska

Antigen MN system MNS	n (%)
MN	192 (50.0)
MM	130 (33.9)
NN	62 (16.1)
Null fenotip	0 (0.0)
Total	384 (100.0)

Analyzing the **S** and **s** antigens in the **MNS** system, in the tested sample of blood donors, the phenotypes Ss were found in most of the donors, 49.0% and ss in 43.2%, whereas the phenotype SS was detected in 7.8% donors.

As for the **Duffy** antigen system**,** most of the donors were found to have the phenotype Fy(a+b+), 46.6% and 34.6% the Fy(a-b+), while the phenotype Fy(a+b-) was observed in 18.8% donors.

Discussion

By analyzing the data of the observed sample, it was determined that 50% examinees belonged to the blood group A, and nearly 50% to the blood group O. The situation was similar in regard to the ABO and RhD: about equal percentage of donors belonged to the blood group A, RhD+(poz) and O, RhD+(poz)- about 36%. As donors who gave blood at least twice were selected for the study, and they were supposed to belong to the blood groups A and O, no wonder there was such a distribution. The most common blood group in populations of the former Yugoslavia was A [1] and people with blood group O were said to be universal erythrocyte donors. [1] The frequency of blood groups ABO in white donors was as follows: O–44%, A– 43%, B–9%, AB–4%. As for black donors, the frequency was the following: O–49%, A–27%, B–20%, AB–4%, whereas the blood group O frequency in the yellow race was 43%, A–27%, B–25%, and AB–5%.[13,14]

When it comes to the distribution of antigens of the Rh phenotype, in the examined donor population, the most common phenotype was CcDee, with the frequency of about 30%. The second most frequent was the phenotype CCDee with about 16%, followed by CcDEe with about 12%, ccDEe with about 9%, ccDee and ccDEE with about 2% frequency. In RhD-negative people, the phenotype ccddee frequency was found to be about 26% in the tested sample, which was considerably more than the D antigen frequency in the white population. This may be due to the fact that this examination included the selected regular blood donors of blood groups A and O, RhD-pos. and RhD-neg, according to the need for examination of the distribution of erythrocyte antigens, and not according to the observance of D antigens in the white population, ranging from 12% to 18%.[15-17] Frequency of RhD-negative persons in the population of soldiers of the former Yugoslavia was 15,5%, whereas RhD–positive 84,5%.[1]

In the sample of blood donors, it was determined that the C^w antigen was in 13 of them (approx. 3%). The C^w and C^x antigens were alleles of the high-frequency MAR antigen, and not, as it was originally believed, the alleles of C and c antigens. C^w was an antigen with relatively low frequency in all populations. In the population of England the C^w antigen had 2,6% frequency, and similar data was found also for other white nations. [15-17]

In the sample of blood donors, 291 (75.8%) of them were found to have the P_1 antigen. The P_1 antigen frequency of blood donors in the group of males was 76.4%, whereas in the group of females it was 70.3%. The P_1 (P_1-positive) and P_2 (P_1-negative) phenotypes were present with the frequency of over 99% in the blood donor population. To show both phenotypes it was necessary to have the synthesis of Pk and P antigens, which differ from one another only in the expression of P_1 antigen. Furthermore, three rare autosomal recessive phenotypes (p, P_1^k, P_2^k) were identified, as well as poor variants of the P_1 antigen.[6,18] The P_1 phenotype frequency was in accordance with the presence of this phenotype in other white nations.

In analyzing the Lewis antigen system, most of the examined blood donors in the Republic of Srpska were found to have the phenotype Le(a-b+) 74.0%, followed by phenotype Le(a+b-), with about 16% of presence, and phenotype Le(a-b-) with the distribution of about 10%. The Le (a–b–) phenotype frequency was higher in people originated in Africa, as compared to other populations. [6-8] Distribution of the Lewis antigens among the blood donors in the Republic of Srpska was in accordance with the data released for the white race.

In analyzing the Lutheran antigen system, most of the examinees of the tested sample of blood donors in the Republic of Srpska were observed to have the phenotype Lu(a-b+) 93.0%, one person was found to have the phenotype Lu(a+b-) (0.3%) and two donors the phenotype Lu(a-b-) (0.5%). The Lu^a (LU1) antigen frequency was about 8% in Europeans and Africans, but it was rare in all other parts of the world. Its antithetical antigen Lu^b (LU2) was present in all populations. [6, 18] The presence of Lu^a and Lu^b antigens was in accordance with the presence in other white populations.

The analysis of K and k antigens in the Kell system in the tested sample of blood donors in the Republic of Srpska showed that most of the examinees had the phenotype kk 93.2% , one person was found to have the phenotype KK (0.3%) and 25 donors the phenotype Kk (6.5%). Distribution of K and k antigens in the examined population was in accordance with the published data. [6,18]

Analyzing the Kp antigen in the Kell system in the tested sample of blood donors, the phenotype Kp(a-b+) was detected in most of the examinees, in 97.9% of them, whereas the phenotype Kp(a+b+) was observed in 8 donors (2.1%). According to the available data, such distribution was fully in correlation with the results of examinations performed on white donors in other countries. [6,18]

In analyzing the Kidd antigen system in the tested sample of blood donors, most of the donors were found to have the phenotype Jk(a+b+), 46.6% and 29.4% the phenotype Jk(a-b+), whereas the phenotype Jk(a+b-) was observed in 24.0% donors. The results were similar to the ones published in available literature. [6, 18]

By studying the MN antigen in the MNS system, most of the donors were typed as MN, 50.0% and 33.9% as MM, while the phenotype NN was detected in 16.1% donors.

Analyzing the S and s antigens in the MNS system, in the tested sample of blood donors, the phenotypes Ss were found in most of the donors, 49.0% and ss in 43.2%, whereas the phenotype SS was detected in 7.8% donors. This was based on results and comparisons made with the usage of similar examinations of the white population in other countries. [6, 18]

As for the Duffy antigen system**,** most of the donors were found to have the phenotype Fy(a+b+), 46.6% and 34.6% the Fy(a-b+), while the phenotype Fy(a+b-) was observed in 18.8% donors. Based on the presented data, it may be concluded that the results of this study are in correlation with the findings received for the phenotypes of the Duffy system in the previous examinations. [6, 18]

Examining the distribution of erythrocyte antigens among blood donors is certainly a significant measure taken in setting up the Registry of Blood Donors with Rare Blood Groups. Naturally, it first starts with the clinically relevant and most present erythrocyte antigens in a given population. Nonetheless, the examination needs to be expanded on antigen frequency that in the examined populations are said to be rare.

Examinations performed in this study constitute a starting point for creating the Registry of blood donors with rare blood groups in the Republic of Srpska, as it refers to a show-sample of regular blood donors, and they will to a large degree instantly facilitate the provision of compatible blood to sensibilised patients.

Conclusion

Distribution of clinically relevant erythrocyte antigens of the Rh phenotype (C, c, D, E, e) and C^w antigen within the Rh system, K, k, Kp^a, Kp^b antigens within the Kell system, M, N, S, s antigens within the MNS system, Fy^a, Fy^b antigens within the Duffy system, Jk^a and Jk^b antigens within the Kidd system, Lu^a and Lu^b in the Lutheran system, and P_1, Le^a and Le^b antigens in the Lewis system in the examined population of regular blood donors on the territory of Banja Luka was determined and was in accordance with the examined and published frequencies for the white population of different countries.

Examinations performed in this study represent a starting point for creating the Registry of blood donors with rare blood groups in the Republic of Srpska, as it refers to a show-sample of regular blood donors, and they will, to a large degree, instantly facilitate the provision of compatible blood to sensibilised patients.

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Distribucija klinički značajnih eritrocitnih antigena u populaciji davalaca krvi Republike Srpske

SAŽETAK

Uvod: Identifikovanje dobrovoljnih davalaca krvi sa rijetkim fenotipskim karakteristikama je osnovni preduslov za formiranje registra davalaca krvi sa rijetkim krvnim grupama.

Cilj rada: Utvrđivanje procentualne zastupljenosti fenotipova klinički najznačajnijih krvnogrupnih sistema kod redovnih davalaca krvi u Zavodu za transfuzijsku medicine Republike Srpske, sa ciljem da se formira nacionalni registar davalaca rijetkih krvnih grupa.

Ispitanici i metode: Određivanje antigena Rh sistema je obavljeno automatskom metodom u mikropločama, kao i metodom u gelu. Određivanje antigena drugih krvnogrupnih sistema Kell, Kidd, Duffy, MNS, Lewis i Lutheran je rađeno metodom u gelu i metodom u epruvetama. Tokom 2012. i 2013.godine ispitana su 384 davaoca krvi.

Rezultati: Analizom Rh fenotipa najviše ispitanika je Rh fenotipa CcDee 29.7% i ccddee 26.0%, a najmanje Rh fenotipa ccddEe 0.8%, Ccddee 1.6% i ccDee 2.3%. Antigen Cw je dokazan kod 13 davalaca (3.4%), a antigen P1 kod 291 davaoca (75.8%) . Analizom antigena sistema Lewis, najviše davalaca je sa fenotipom Le (a-b+) 74.0%. Analizom antigena sistema Lutheran, najviše davalaca je sa fenotipom Lu (a-b+) 93.0% . Kod jedne osobe je pronađen fenotip Lu (a+b-) (0.3%), a kod dva davaoca fenotip Lu(a-b-) (0.5%). Analizom antigena sistema Kell, najviše davalaca je sa fenotipom kk 93.2% , kod jedne osobe je pronađen fenotip KK (0.3%) i kod 25 davalaca fenotip Kk (6.5%). Analizom antigena sistema Kidd, najviše davalaca je sa fenotipom Jk(a+b+) 46.6% i sa Jk(a-b+) 29.4%, a fenotip Jk(a+b-) ima 24.0% . Ispitivanjem antigena MN sistema MNS, najviše je davalaca sa fenotipom MN 50.0% i sa MM 33.9%, a fenotip NN je zastupljen kod 16.1% davalaca.. Analizom antigena S i s sistema MNS, najviše davalaca je sa fenotipovima Ss 49.0% i ss 43.2%, a kod 7.8% davalaca je pronađen fenotip SS. Analizom antigena sistema Duffy, najviše davalaca je sa fenotipom Fy(a+b+) 46.6% i sa Fy (a-b+) 34.6%, a fenotip Fy(a+b-) je zastupljen kod 18.8% davalaca.

Zaključak: Podaci o distribuciji klinički značajnih eritrocitnih antigena u populaciji redovnih davalaca krvi Republike Srpske su u skladu sa podacima iz literature za bijelu rasu.

Ključne riječi: krvne grupe, eritrocitni antigeni, distribucija klinički značajnih eritrocitnih antigena

ORIGINAL ARTICLE

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Disturbances of Bone and Mineral Metabolism in Patients on Hemodialysis

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ABSTRACT

Introduction: Unless promptly treated, disturbances of bone and mineral metabolism during the course of chronic kidney disease can lead to serious complications. These abnormalities as well as other factors related to the uremic state affect the skeleton and result in disruption of homeostasis in the bone and mineral turnover. It is manifested by abnormal concentration of phosphorus and calcium in serum and tissues and changes in the concentration of PTH. The spectrum of skeletal abnormalities seen in renal osteodystrophy includes: osteitis fibrosa, osteomalacia, adynamic bone disease (ABD), osteopenia or osteoporosis and combinations of these abnormalities termed mixed renal osteodystrophy.

Aim of the study: The aim of our study was to assess biochemical parameters of mineral and bone metabolism in hemodialysis patients.

Patients and Methods: The research involved 30 patients (retrospective type of study), mean age 62.43; fifteen men (50%) and fifteen women (50%). Patients were divided into groups in respect to the length of dialysis treatment (group I - up to 5 years, group II - 5-10 years and group III - over 10 years).

Conclusion: Serum phosphorus, calcium, alkaline phosphatase and PTH values were increased with duration of dialysis. The most reliable marker for clinical monitoring of bone disease in dialysis patients is PTH, which correlates well with the values of alkaline phosphatase (p=0,006) and calcium (p= 0,021).

Key words: mineral and bone metabolism, PTH, calcium, phosphorus, hemodialysis.

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Introduction

Disturbances of bone and mineral metabolism in chronic kidney insufficiency include abnormal concentrations of serum calcium, phosphorus, magnesium, concentration disorders of parathormone (PTH), fibroblast factor of growth 23 (FGF-23) and vitamin D metabolism.[1] Stimulus for the secretion of PTH and hyperplasia of parathyroid glands is hyperphosphatemia, diminished synthesis of 1,25-dihydroxyvitamin D3 and hypocalcaemia.[2,3] These disorders as well as uremia affect skeletal system, causing renal osteodystorphy (ROD). The range of changes in the bones include: osteitis fibrosis (manifestation of hyperparathyroidism with increased osteoclastic and osteoblastic activity, peritrabecular fibrosis and accelerated

bone turnover-high turnover), osteomalacia (decreased mineralization of newly formed osteoid, slow bone turnover-low turnover), adynamic bone disease (ABD) in which we find very low turnover with reduced formation of bone tissue as a consequence of long-term hypocalcaemia resulting from the use of calcium-based phosphorus binders over a long period of time and high concentration of calcium in dialysis fluid, [4] osteopenia and osteoporosis, and a combination of all of these abnormalities, which is called mixed renal osteodystrophy. In patients on hemodialysis, osteitis fibrosis and ABD have nearly the same frequency of occurrence and in patients on peritoneal dialysis, adynamic bone disease is dominant. [5]

Calcium and phosphorus metabolism disturbances occur quite early in chronic kidney insufficiency, and in stage 3 (GFR 30-59ml/min/1,73m2) or 4 (GFR 29-15ml min/1,73m2) we find elevated PTH in the blood [2,3] and calcified lesions in blood vessels can be seen. Recent studies suggest that chronically elevated FGF-23 directly affects the incidence of occurrence of left ventricular hypertrophy and mortality of KVS complications.[6] According to the data available, a strong, independent predictor of mortality in kidney insufficiency is hyperphosphatemia; medium strong predictor is elevated level of serum calcium and weak, but a significant predictor is low or high PTH level. The total predicted mortality risk by disorders of mineral metabolism in hemodyalisis patients is 17%.[7] Calcium and phosphorus metabolism disturbance is an important factor in the development of cardiovascular calcifications and can often be found in younger hemodialysis patients. [8]

The main aims of treatment of secondary hyperparathyroidism in chronic kidney insufficiency are: prevention of various types of renal osteodystrophy, maintenance of calcium homeostasis, phosphate, vitamin D and reduction of vascular and soft tissue calcifications. [9]

Aim of the study

The aim of the research was to evaluate the biochemical parameters of mineral and bone metabolism in patients undergoing chronic hemodialysis program, based on the cross sectional data which were analyzed in March 2013.

Patients and Methods

We analyzed patients on chronic hemodialysis program (3x4h per week) with urine output less than 400ml/24h. The research included 30 patients, 15 males and 15 females. Patients were divided into groups based on the length of dialysis (HD) duration. The first group comprised of patients who have been on HD for up to 5 years, the second group comprised of patients who have been on HD for 5-10 years, and the third group included patients whose HD has been over 10 years.

Laboratory analyzes were performed in the laboratory of the Clinical Center Banja Luka on the apparatus Cobas E601 and Olympus, as follows: the determination of total serum calcium, serum phosphate, alkaline phosphates and PTH. The range of reference values is 2,20-2,65 mmol/L for calcium, 0,87-1,45 mmol/L for phosphorus, alkaline phosphates 30-120 U/L, PTH 15-65pg/ml.

Data processing was done in MS Office Word 2007, MS Office Excel 2007 and statistical analysis was done by statistical software package SPSS 21.0. To display quantitative data we used the indicators of descriptive statistics. To compare the differences of frequency of observed characteristics regarding the group of patients we used Pearson's χ^2 contingency test. Normality of distribution of the observed characteristics was tested by the Kolmogorov -Smirnov normality test. To compare the mean values of characteristics we used the Student's t-test for independent samples and the Mann -Whitney U-test for two independent samples. In order to determine the degree of correlation we used the Spearman correlation. The values with $p<0,05$ were taken as statistically significant.

Results

Considering that disturbance of bone and mineral metabolism leads to a significant deterioration of the quality of life, morbidity, mortality, particularly because of the cardiovascular complications, the recommendation of a good clinical practice guideline (American K/DOQI clinical guidelines), when it comes to the HD patients, is to have the levels of PTH and alkaline phosphates determined every three months and the levels of calcium and phosphorus every month.[10]

Our research included 30 patients, 15 males and 15 females with a mean age of 62,43 years. Duration of dialysis for a period of less than 5 years was in 63,3%, from 5 to10 years in 26,6% of respondents, and every tenth respondent had dialysis duration of more than 10 years. The average length of dialysis duration in women was 60,8 months (Cl 95%:3, 45-88, 15), and in men 44,4 months (Cl 95%: 21, 8-67, 0). Serum calcium below the reference value was found in 63,1% of respondents with duration of dialysis less than 5 years, while none of the respondents in this group had calcemia above the normal values. With the increase of duration of dialysis increases the percentage of respondents with hypocalcaemia, while none of the respondents with the duration of dialysis longer than 5 years had any serum calcium below the reference values. There is a statistical significance in relation to the duration of dialysis and calcemia ($p<0,001$).

The average value of serum phosphorus increased with the increase of the length of HD duration (I group 1,50 mmol/L (IQ:1,12-2,10), II group 1,60 (IQ: 1,41-1,77mmol/L), III group 2,03 mmol/L (IQ: 1,57-2,84). Reference values of

phosphorus were in 42,11% of patients in the first group, 25% of patients in the second group and there were no reference values in the third group. As for the duration of dialysis of patients, no statistically significant differences in phosphorus were observed (Table1.).

Table 1. Values of phosphorus (mmol/L) according to the duration of dialysis

Phosphorus (mmol/L)		Duration of dialysis			
		Less than 5 years	From 5 to 10 years	Over 10 years	Total
Number of patients		19	8	3	30
Arithmetic mean		1,58	1,61	2,15	1,64
Standard deviation		0,54	0,25	0,64	0,50
Standard error of arithmetic mean		0,12	0,09	0,37	0,09
95% Confidence interval	Lower limit	1,34	1,43	1,42	1,46
	Upper limit	1,82	1,78	2,87	1,82
Minimum		0,90	1,31	1,57	0,90
First quartile - Q1		1,12	1,41	1,57	1,30
Mediana - Q2		1,50	1,60	2,03	1,55
Third quartile - Q3		2,10	1,77	2,84	2,01
Maximum		2,85	2,01	2,84	2,85
Mann-Whitney U- test for independent samples					
Less than 5 years - From 5 to 10 years		p = 0,425			
Less than 5 years - Over 10 years		p = 0,114			
From 5 to 10 years - Over 10 years		p = 0,152			

Average value of alkaline phosphates in the first (I) group of patients was 110,9 U/L (Cl 95% 99,6-122,21), in the second (II) group 115,5 U/L (Cl 95%:97-134), and in the third (III) group of patients it was 124,33 U/L (Cl 95%:141,3-149,3). The values of alkaline phosphates in patients with less than 5 years of dialysis duration (I group) were statistically significantly lower than in patients with duration of dialysis longer than 10 years (III group), p<0,001 (Table 2).

Table 2. Values of alkaline phosphates (U/L) according to the duration of dialysis

Alkaline phosphates (U/L)	Duration of dialysis			
	Less than 5 years	From 5 to 10 years	Over 10 years	Total
Number of patients	19	8	3	30
Arithmetic mean	110,95	115,50	145,33	115,60
Standard deviation	25,05	26,70	3,51	25,85
Standard error of arithmetic mean	5,75	9,44	2,03	4,72
95% Confidence interval Lower limit	99,68	97,00	141,36	106,35
95% Confidence interval Upper limit	122,21	134,00	149,31	124,85
Minimum	60,00	63,00	142,00	60,00
First quartile - Q1	95,00	101,50	142,00	97,00
Mediana - Q2	121,00	123,00	145,00	123,50
Third quartile - Q3	134,00	135,00	149,00	136,00
Maximum	142,00	142,00	149,00	149,00
Student's t-test for independent samples				
Less than 5 years - From 5 to 10 years	p = 0,676			
Less than 5 years - Over 10 years	p < 0,001			
From 5 to 10 years - Over 10 years	p = 0,095			

Parathormon (PTH) showed an upward trend with the length of dialysis duration; I group 70 pg/ml (IQ: 61, 0-82, 0), II group 81 pg/ml (IQ 43, 0-122, 5), III group 321 pg/ml (IQ: 310, 0-380, 0). The value of PTH was statistically significantly higher in patients from the III group (10 and more years of HD duration) in comparison to the patients from the I group (up to 5 years of HD duration) p=0,006 (Table 3).

Table 3. Correlation of parathormon (pg/ml) according to the duration of dialysis

Parathormon (pg/ml)		Duration of dialysis			
		Less than 5 years	From 5 to 10 years	Over 10 years	Total
Number of patients		19	8	3	30
Arithmetic mean		74,68	124,88	337,00	114,30
Standard deviation		32,07	120,23	37,64	102,05
Standard error of arithmetic mean		7,36	42,51	21,73	18,63
95% Confidence interval	Lower limit	60,26	41,56	294,40	77,78
	Upper limit	89,10	208,19	379,60	150,82
Minimum		18,00	43,00	310,00	18,00
First quartile - Q1		61,00	67,50	310,00	67,00
Mediana - Q2		70,00	81,00	321,00	77,00
Third quartile - Q3		82,00	122,50	380,00	112,00
Maximum		154,00	414,00	380,00	414,00
Mann-Whitney U- test for independent samples					
Less than 5 years - From 5 to 10 years		p = 0,232			
Less than 5 years - Over 10 years		p = 0,006			
From 5 to 10 years - Over 10 years		p = 0,066			

It can be noted that patients from the first group (HD duration up to 5 years) have hypocalcemia (63%), hyperphosphatemia (57%), elevated PTH (73,6%) and alkaline phosphates (52%), which indicates a bone disease with high turnover. Considering that all patients have been treated with calcium-based phosphorus binders it is necessary to have a continuous education of patients in terms of diet and dietary intake of phosphorus reduction.

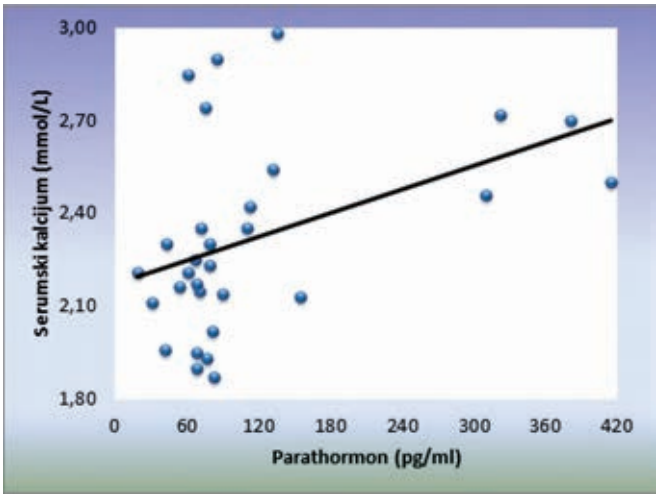
With prolonged dialysis duration we found deterioration of biochemical markers of bone metabolism which indicated a deterioration of renal osteodystrophy and development of adynamic bone disease (ABD).

Discussion

According to the literature, ABD is significant because of the high percentage of representation (>40% of patients in HBI stage 5) and high percentage of cardiovascular calcifications and mortality .[8-11] The incidence of fractures is 2 times higher in patients with low turnover than in high turnover. [5]

According to our research, PTH is in good correlation with calcium (p= 0,021,ρ=0,42), Graph 1., and alkaline phosphataze (p=0,006, ρ=0,488), while the values of phosphorus and alkaline phosphataze are in a statistically significant, medium high positive correlation (p=0,017, ρ=0,431).

Graph 1. Scatter-plot diagram for parathormon (pg/ml) and serum calcium (mmol/l)



ρ	p	n
0,420	0,021	30

Conclusion

Based on the results, we can conclude that PTH is the most valid marker for monitoring of bone disease. All these disorders lead to an increase in the prevalence of adverse outcomes in patients undergoing hemodialysis and it is necessary to monitor them in order to improve the quality of life and to reduce morbidity and mortality of patients. Determination of PTH values as well as other biochemical markers is needed for the initial evaluation of patients with bone disease and for the assessment of the therapeutic effect of prescribed therapy.

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Poremećaji koštano-mineralnog metabolizma kod hemodijaliznih pacijenata

SAŽETAK

Uvod: Poremećaji koštano-mineralnog metabolizma u toku hronične bubrežne slabosti mogu dovesti do ozbiljnih komplikacija ukoliko se ne liječe na vrijeme. Ove abnormalnosti, kao i drugi faktori povezani sa uremičnim stanjem, utiču na koštani system, što rezultuje u poremećenom stvaranju-prometu kosti (turnover), a manifestuje se biohemijskim poremećajima serumskog fosfora i kalcija, kalcifikacijom tkiva i promjenama nivoa parathormona (PTH). Spektar koštanih poremećaja u renalnoj osteodistrofiji je: osteitis fibroza, osteomalacija, adinamična bolest kostiju, osteopenija ili osteoporoza i kombinacija svih ovih poremećaja-miješana renalna osteodistrofija.

Cilj rada: Ovaj rad je procijena biohemijskih parametara koštano-mineralnog metabolizma kod hemodijaliznih pacijenata.

Ispitanici i metode: Istraživanje je obuhvatilo 30 pacijenata (retrospektivni tip studije), srednje životne dobi 62, 43 god., a od tog broja bilo je 15 žena (50%) i 15 muškaraca (50%). Pacijenti su bili podijeljeni u odnosu na hemodijalizni staž na tri grupe (grupa I-do 5 god., grupa II- od 5 do 10 god., grupa III-preko 10 god.).

Zaključak: Vrijednosti serumskog fosfora, kalcija, alkalne fosfataze i PTH su se povećavale sa produženjem vremena provedenog na hemodijalizi. Najpouzdaniji marker za kliničko praćenje koštane bolesti kod dijaliznih bolesnika je PTH, koji dobro korelira sa vrijednostima alkalne fosfataze (p=0,006) i kalcija (p=0,021).

Ključne riječi: mineralno-koštani metabolizam, PTH, kalcij, fosfor, hemodijaliza.

ORIGINAL ARTICLE

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Prevalence of HIV and other Sexually Transmitted Infections among Female Sex Workers in Bosnia and Herzegovina

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ABSTRACT

Introduction: Sex workers (SW) represent the population exposed to extremely high risk of HIV (HIV - Human Immunodeficiency Virus) and other sexually transmitted infections. Poor socioeconomic conditions in the country, insufficient education, high unemployment and other factors lead to an increase in prostitution, which represents a high risk for the spread of HIV and other sexually transmitted diseases.

Aim of the study: The aim of this research was to evaluate the prevalence of HIV/sexually transmitted infections among SW in Bosnia and Herzegovina as well as to examine knowledge, attitudes and behaviour relating to HIV/sexually transmitted infections. The results were compared with the results obtained in researches conducted in 2008 and 2010.

Material and Methods: Research was performed in 2012 as a bio-behavioral study that covered 199 sex workers in five cities of Bosnia and Herzegovina. Interviewing was done voluntarily, anonymously and confidentially, and after informed consent and councelling, a biological material (blood) for laboratory testing on HIV, hepatitis b, hepatitis c and syphilis was taken. The research shows the presence of risk behaviour among SW, mostly related to frequent change of partners and frequent unprotected sexual intercourses.

Results:
Only one third of respondents (36,7%) use condom during every sexual intercourse with a client, and 13% use it with a steady partner.A sexual intercourse after effects of consumption of alcohol-87,9% of respondents and of drugs-36,7% of respondents. Although there is a risk behaviour, only 11,1% think that the risk of HIV/sexually transmitted infections is high, but 12,6% think that there is no risk. Sex workers are 13,5 times more exposed to HIV infection than all the other women aged 15- 49. Results of laboratory testing indicate a low level of HIV/sexually transmitted infections among sex workers in Bosnia and Herzegovina.

Conclusion:
Although there is a relative progress in prevention of HIV/sexually transmitted infections among sex workers and more frequent testing on HIV/sexually transmitted infections comparing to earlier periods, these things are insufficient for the maintenance of a low level of infection. Further research at certain time intervals among this population would enable monitoring time trends of HIV epidemic in Bosnia and Herzegovina and would become a basis for the development of preventable programmes.

Key words: prevalence, HIV, sexually transmitted infections, sex workers.

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Introduction

HIV (Human Immunodeficiency Virus) and other sexually transmitted infections (hepatitis b, hepatitis c, syphilis etc.) still represent one of the largest problems of public health worldwide.

According to data from the World Health Organization, it is estimated that there are about 35 million people worldwide currently living with HIV, out of which 3 million are children, while 19 million do not know that they are HIV-positive[1]. It is also considered that out of the total number of 35 million of HIV positive people, 2-4 million also have hepatitis b and 4-5 million are with hepatitis c too. The highest number of those infected is still in sub-Saharan Africa.[2]

Although the total number of newly infected cases was 2,1 million in 2013, there is globally a decreasing trend in new cases of HIV infections. In comparison to 2001, when the number of newly infected was 3,4 million, there was a decline in the number of new infections registered in 2012 by 33% (2,3 millions) and by 38% in 2013 [2]. The number of newly infected children in 2013 was 240 000, which was 58% lower than in 2002 when the number was 580 000. [1]

The number of death cases caused by Acquired Immune Deficiency Syndrome – AIDS was reduced by 35% in comparison to 2005, when it reached its maximum. Only in last three years, mortality dropped by 19%, which is the highest annual drop in the last 10 years.[1] However, a significant increase in the number of death cases happened in certain regions at the same period of time (Middle East, Northern Africa, Eastern Europe, and Central Asia).

According to the definition by the World Health Organization, sex workers are considered to be female, male, and transsexual adult persons (at the age of 18 and more) who receive money or goods in exchange for sexual services they provide regularly or occasionally. [4]

Sex workers are extremely important population that must be controlled in order to prevent the expansion of HIV and other sexually transmitted infections, since due to the frequent unprotected sexual intercourses and other factors, they can be a cause of infection transmission on clients who then infect their partners and, in that way, the epidemic is also being expended among general population.

Having in mind specific high risk behaviour, the World Health Organization defines sex workers as groups under a higher risk of HIV infection and thus request primary prevention of HIV infection, diagnosis, treatment and care.[4]

There are many reasons for that, but primarily it is related to frequent sexual intercourses with different clients without regular use of condoms, followed by a high percentage of drug and alcohol consumption during intercourses, thus increasing the risk of infection transmission.

Sex workers are also often exposed to discrimination, stigmatization, violence and other negative social occurrences, and they are not easily available for regular testing, prevention and treatment. [3,4]

According to data obtained between 2007 and 2011, it was determined that HIV prevalence among SW was 11,8% with significant deviations between regions. HIV prevalence in sub-Saharan Africa was 36,9%, in Eastern Europe it was 10,9%, in Latin America and Caribbean 6,1% and in Asia 5,2%. The lowest HIV prevalence among SW was recorded in the Middle East and in Northern Africa (1,7%).[3] The study also showed that SW were 13,5 times more exposed to the risk of HIV infection than all the other women aged 15 – 49.[3]

Therefore it is crucial to do constant monitoring of HIV infection trend as well as behaviour related to HIV and the availability of antiretroviral therapy and potential usage of prophylaxis, especially among vulnerable populations.[5]

Aims of the study

The general aim of the research conducted from September to December of 2012 was to examine the risk behaviour of SW population in Bosnia and Herzegovina - the population exposed to the increased risk of HIV/sexually transmitted infections. The aim was also to identify risk factors and forms of risk-taking behaviour in order to plan preventive measures and to evaluate the success and coverage of target population conducted by prevented programmes.

Specific aims of the research included:

- to evaluate the prevalence of HIV and selected sexually transmitted infections in SW population and the risk factors accompanied with HIV infection;
- to examine knowledge, attitude and behaviour relating to HIV/sexually transmitted infections in SW population;
- to examine sociodemographic and cultural features relating to relevant risk behaviour of target population and to compare the data obtained with the researches conducted in 2008 and 2010.

Patients and Methods

The research was conducted as a descriptive, multicentric and bio-behavioral study of the prevalence among SW who were defined as any female person who exchanged sexual services for money or something else.

Inclusion criteria for participation in a study were as follows: self-identificationof a person as a SW, then that they were engaged in paid sexual service in the past 12 months (penetrative sex), that were older than 16, and given

informed consent for participation in the study. Exclusion criteria were as follows: a person younger than 16 and current injection drug user. The research was conducted with the prior approval from the Ethical Committee of the Public Health Institute of the Republic of Srpska.

The research was conducted in five larger cities in Bosnia and Herzegovina. The sample was selected by using a snowball sample.

Field research covered 199 sexual workers aged 18-48. By applying standardized and encrypted questionnaire of an interview method, interviewing was done voluntarily, anonymously and confidentially. After informed consent, blood samples were taken for laboratory testing on HIV, hepatitis B, hepatitis C and syphilis. Blood sample and a referral with an identification code as on the questionnaire were delivered to the laboratory.

Newer-generation ELISA tests were used for testing which was performed in the microbiological laboratory of the Public Health Institute of the Republic of Srpska and in the Institute for Biomedical Diagnostics and Research '' Nalaz" from Sarajevo.

Respondents were given a phone number on which they could, within 15 days, got the information on testing results and possible post-test consultation.

A software SPSS for Windows (version 15.00, SPSS INC, Chicago, Illinois, USA) was used for statistical data analysis. A method of descriptive statistics was used in data processing. Data were shown as frequency and percentage for categorical variables, mediana and range for ordinals, mean and standard deviation, depending on data distribution, for continuous variables. $\chi 2$ test, with the degree of probability of $p<0,05$, was used to test differences.

Results

The research covered 199 respondents in five cities of Bosnia and Herzegovina: Bijeljina (34), Banja Luka (55), Mostar (30), Sarajevo (50), and Zenica (30). Majority of the respondents are citizens of Bosnia and Herzegovina (95,5%), out of which 89,4% live in the city. The mean age of respondents is 27,75 (SD= 6,12; IQR=18-48 years). According to the educational structure, the highest percentage of respondents have secondary school education (67,8%), followed by the university degree (16,1%) and associated degree (10,1%), and 6% with completed primary school education. About half of the respondents (51,8%) do not have permanent employment, 17,6% are permanently employed, 21,1% work occasionally, and 9,5% are students. About half of the respondents (54,3%) have a health insurance. 11,6% of the respondents are married, 14,6% are divorced, and the highest percentage is of the single women (67,8%) and that difference is statistically significant ($p<0,001$).

We compared results of our research with the results of the researches conducted in Bosnia and Herzegovina in 2008 and 2010.

The average age of the first sexual intercourse is 16,5 (SD=1,72; IQR=13-22). 27,6% of the respondents had their first sexual intercourse under the age of 16, 59,8% of them at the age of 16-18, and 12,6% of them (the lowest percentage) had their first sexual intercourse after the age of 18 and that difference is stastically significant ($p<0,001$). 8% of respondents had their first paid sexual service for money or something else under the age of 16, about half of them (50,8%) at the age of 17-21, and about one third (32,7%) at the age of 22-26. The average age of the first paid sexual service is 21 and, comparing to the previous researches, it has decreasing trend (in 2008 –the age of 23,3 and in 2010 – the age of 21,2).

The average duration of providing sexual services is 6,1 years (SD=4,58; IQR=1-24).

Majority of respondents (75,9%) states up to five clients a week, and the average number of clients per week is 3,2, which is less than in the researches conducted in 2008 and 2010, so it has a decreasing trend. The most common way for finding clients is via corresponding contact person (47,7%). Places where respondents mainly meet their clients are clubs/casinos (64,3%), followed by private parties (53,6%), caffe bars (48,2%), but not that often in park or on the street. Places where respondents offer sexual services most often are in rented room (59,8%), hotel (53,3%), their own flat/house (53,3%), public facility (5%), park or some other public place (3,5%).

More than 50% of respondents experienced some kind of violence- most often psychological one (33,7%), physical one (33,2%), and 1,5% of them were victims of trafficking.

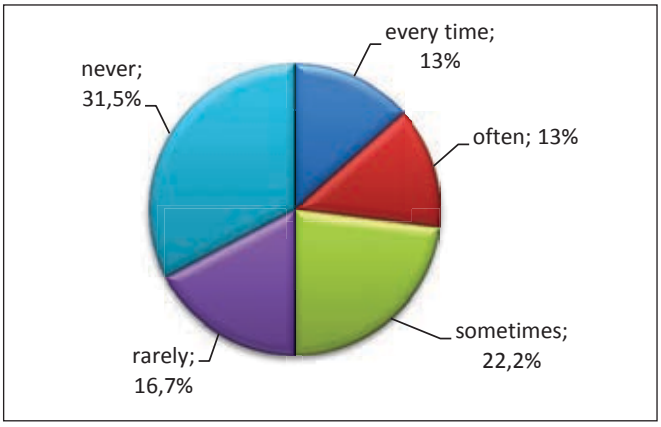
Almost all the respondents (97%) state that they provide sexual services for money. About half of respondents (46,2%) provide sexual services for clothes, while a lower percentage of them for food, drink and drugs. 54% of respondents were paid for sexual intercourse in the last month. Experience of imprisonment had 4,5% of SW. About 90% of respondents provided the oral and vaginal sexual services, but 49,7% of them provided the anal sexual services in the last month.

When it comes to the use of condom as the most important measure for prevention of HIV/sexually transmitted infections the results are still unsatisfactory.

Only 36,7% of respondents state that they use condoms during every sexual intercourse with a client, unlike 2,5% of

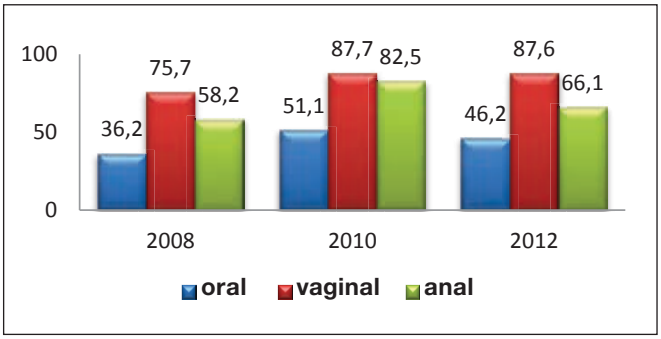
them who say that they did not use a condom with a client in the past month. Only 31,2 % of respondents state that they often use condoms. The frequency for condom usage with a steady partner is extremely low; only 13% of them say that they use condoms every time, 13% of them say that they often use them and 31,5% of them say that they never use condoms with a steady partner (Graph 1).

Graph 1. Frequency of condom use with a steady partner (in 2012)



The highest rate of condom use with a client is during vaginal sexual intercourse (87,6%), followed by the anal sexual intercourse (66,1%), and the lowest rate of condom use is reported during oral sexual intercourse (46,2%). The frequency of condom use during last sexual intercourse is 87,6% and it is of approximate rate to the one from the research conducted in 2010, while there is a noticeable decline of rate in condom use during anal sexual intercourse (66,1%) in comparison to the previous research when it was 82,5% (Graph 2.).

Graph 2. Frequency of condom use during last sexual intercourse (in 2008, 2010 and 2012)



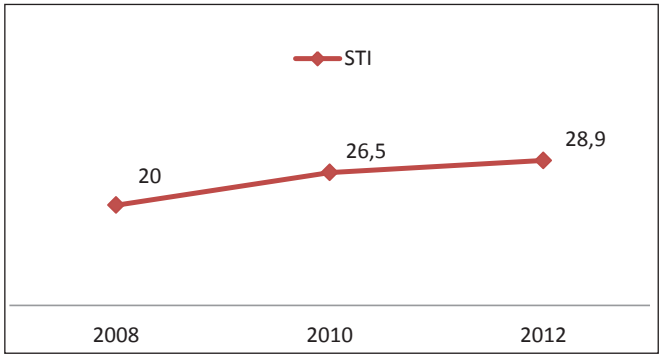
According to the place of research, condom usage rate shows significant differences. During last vaginal sexual intercourse, the use of condom is lowest in Banja Luka (74,5%), and the highest rate is in Sarajevo (100%). When it comes to the anal sexual intercourse, the lowest rate is in Mostar (50%), but the highest rate is in Sarajevo (86,1%). During the last oral sexual intercourse, the highest rate is in Sarajevo (68%), and the lowest one is in Bijeljina (24,2%).

As a reason for the use of condom while providing sexual services, 80,8% of respondents state that they use condoms because they want to. This percentage is significantly higher than in the previous research (59,6%). Only 39,9% of respondents use condoms upon client's request.

When it comes to other risk behaviours, there is a decrising trend in comparison to the previous researches. A high percentage of respondents (87,9%) state the experience of sexual intercourse under alcohol influence, and 36,7% under drug influence, which must be interpreted carefully since injection drug users were not taken into research.

Comparing to the previous two researches, there is an increase of percentage of those who state that they had some sexually transmitted infections (28,9%) (Graph 3).

Graph 3. Self-reported sexually transmitted infections (STI), a trend (2008, 2010 and 2012)



The most commonly self-registered sexually transmitted infections are HPV (32,7%), gonorrhea (26,2%), genital herpes (24,4%), and the least common self-registered STI are syphilis (3,2%) , hepatitis B virus (1,6%) and other (13,1%) .

Out of the total number of eight questions related to their knowledge of HIV/sexually transmitted infection, 28,1% of respondents answered correctly all the questions. When compared with the previous researches (2008 and 2010) the respondents in this research showed a slightly better knowledge (Table 1.).

By analyzing the self-assessment results of the risk on HIV/ sexually transmitted infections, only 11,1% state that the risk is high, 12,6% of them say that there is no risk, 31,2% of them say that the risk is low. The answer that the risk is moderate gave 45,2% of them (the largest percentage).

Table 1. Knowledge on HIV/STI total sample of SW (2008, 2010 and 2012)

Questions	BiH 2008	BiH 2010	BiH 2012
HIV infection can be significantly decreased by proper condom usage	n=146	n=154	n=198
yes	92,5	96,1	99,5
no	1,4	1,9	0,5
doesn't know	6,2	1,9	0
A person looking healthy can be HIV infected	n=146	n=154	n=199
yes	70,5	84,4	81,9
no	8,2	5,2	6,5
doesn't know	21,2	10,4	11,6
When using cutlery used by HIV infected persons, another person can be infected by HIV	n=144	n=154	n=199
yes	11,0	12,3	11,6
no	56,3	56,5	71,9
doesn't know	32,7	31,2	16,6
When using already used needles, a person can be infected by HIV		n=154	n=199
yes		96,8	92,5
no		0,6	0,5
doesn't know		2,6	7,0
STI can be transmitted by oral sexual intercourse		n=154	n=199
yes		54,5	71,9
no		14,9	16,6
doesn't know		30,5	11,6
A pregnant woman with HIV can pass HIV to her baby	n=146	n=154	n=199
yes	72,6	81,2	80,4
no	5,5	5,8	4,0
doesn't know	21,9	13,0	15,6
A person can be HIV infected by mosquito bite		n=154	n=199
yes		11,0	14,1
no		48,1	62,8
doesn't know		40,9	23,1
The risk of HIV is decreased by mutual fidelity among HIV-uninfected sexual partners			n=199
yes			71,9
no			14,1
doesn't know			14,1

n = a number of respondents who answered the question

In all three researches, there is a declining trend of self-assessment that the risk of HIV/sexually transmitted infections is high, and there is an increasing trend of self-assessment that there is no risk. This is worrying and points to a lack of knowledge and awareness of this population.

When asked if they knew a place where they could get tested, 84,9% of respondents answered confirmatively, mostly referring to the Clinic for Infectious Diseases, and 44% of respondents to the Non-Governmental Organizations (NGO counselling centres) as of places where they can get tested for HIV/STI infection.

The results showed that almost two thirds of respondents (59,8%) had never been tested for HIV and that was significantly higher comparing to the respondents who had done it once or several times (40,2%) ($p<0,001\%$). Of the total number of respondents, 20 of them (10,1%) got tested for HIV in the past 12 months and they know the test result, which is slightly lower comparing to the previous researches (13,6% in 2010 and 13,7% in 2008).

By analyzing the results of respondents who got tested for HIV in the past 12 months, according to the place, the largest number of respondents got tested in Banja Luka (47,4%) and the lowest number in Bijeljina (5,6%); the percentage of respondents who want to know the test results: 16,7% in Zenica, 16,4% in Banja Luka, 13,3% in Mostar, 2,9% in Bijeljina and 2% in Sarajevo.

After informed consent, all respondents gave blood for testing for HIV, HBV, HCV and syphilis. Test results showed that one sample was reactive on HIV, eight samples were reactive on HCV, one sample was reactive on HBV, and none on syphilis. Comparative test results in researches conducted (2008, 2010 and 2012) are shown on Graph 4. The lower rate of reactive results for HCV infection in research conducted in 2012 can be the result of the current injection drug users exclusion from the study.

Discussion

This is the third bio-behavioral science section conducted in order to assess the prevalence of HIV/sexually transmitted infections, knowledge and attitude, and risk and protective forms of behaviour among SW population in Bosnia and Herzegovina. Based on the data obtained in the studies conducted, the occurrence and expansion of HIV/sexually transmitted infections can be followed among SW population in Bosnia and Herzegovina as well as their knowledge, attitudes and behaviour.

The research conducted in five cities of Bosnia and Herzegovina from September to November 2012 included 199 respondents of an average age 27,7 without significant differences when it comes to age in comparison to the researches from 2008 and 2010. [13,14] The respondents were citizens of Bosnia and Herzegovina, from urban areas. The largest percentage of respondents have secondary school education (67,8%). Slightly more than a half of

the respondents (51,8%) were not employed at the time of interviewing and 17,6% of them are permanently employed, which shows the obvious increase rate of employees, because the number of students/pupils decreases comparing to the researches from 2008 and 2010. [13,14]

The largest number of respondents are single (67,8%), 11,6% of respondents are married, without significant differences in comparison to the researches from 2008 and 2010.[13,14] The average age of the first sexual intercourse among respondents is 16,5. The largest number of respondents (59,8%) had their first sexual intercourse at the age of 16 -18, and 30% of them had their first sexual intercourse before the age of 16. 8% of respondents had their first paid sexual service for money or something else before the age of 16, and about a half of the respondents (50,8%) at the age of 17-21. These data are especially worrying because, according to the Convention on the Rights of the Child (CRC), children and adolescents who are less than 18 years old, but who provide sexual services for money or something else, are considered to be 'sexually exploited', and not sexual workers.[3]

By analyzing the results of the age of the first sexual intercourse in all three researches, it can be noticed that the age limit is lowered comparing to the research in 2008 (17,3 years) and it is slightly higher than in 2010 (16,3 years).[13,14]

The average age of providing the first paid sexual intercourse among respondents is 21 years and, comparing to the previous researches, it has a decreasing trend, which implies that younger and younger population is engaged in sexual services. The largest number of the respondents state that their engagement in sexual services lasts for about 6,1 years, which is slightly less comparing to the research in 2010 (6,7 years), but more comparing to the research in 2008 (4,4 years), with an average of three clients a week. [13,14]

The highest rate of condom usage during sexual intercourse with a client is reported during vaginal intercourse (87,6%), followed by the anal intercourse (66,1%), and the lowest rate of the use of condom is reported during the oral sexual intercourse (46,2%). There has been a decline in the rate of condom usage during the anal sexual intercourse (66,1%) comparing to the previous research (82,5%).[14] The research results on the use of condom in terms of locations/cities show the largest frequency of condom usage for all three types of sexual intercourses among the respondents in Sarajevo, but the lowest one in Bijeljina for the oral intercourse, in Banja Luka for the vaginal intecourse, and in Mostar for the anal intercourse.

More than two thirds of respondents say that they get condoms from the non-governmental organizations, through Voluntary Counselling and Testing centres, and through other field activities.

A large number of respondents state that they provided sexual services under the influence of alcohol (87,9%) which when compared to the previous researches has a trend of slight decrease,[13,14] and under drug influence (36,7%), which is less than in 2010.[14] 28,9% of respondents report having had a sexually transmitted infection, with increasing trend comparing to the previous researches.[13,14] The most usual infections are HPV, gonorrhea and genital herpes, then syphilis, hepatitis b or some other sexually transmitted infections.

When suspecting some sexually transmitted infection, more than a half of the respondents would go to the doctors in the private health institutions, which can indicate a certain lack of confidence, fear of stigma, and thus insufficiently accessible health service.

28,1% of respondents answered correctly on all 8 questions related to the knowledge of HIV/sexually transmitted infections and the modes of transmission and the rate of correct answers on most questions was over 70%, which was slightly better comparing to previous researches.[13,14] When it comes to the self-assessment on the risk of HIV/STI, the largest percentage of respondents think that the risk of HIV infection is moderate to low, some of them are aware of the real risk, but that awareness decreases in comparison to the previous researches, thus indicating a further need for raising awareness about this problem.

Similar results on knowledge, attitudes and practice as well as on STI prevalence are obtained in the researches conducted in other countries of the Balkans, which confirmed that the countries of southeastern Europe belong to the countries with a low prevalence of HIV/sexually transmitted infections, but still with the insufficient level of awareness about prevention, diagnosis and treatment of these diseases, with certain improvements comparing to the previous period.[6-9]

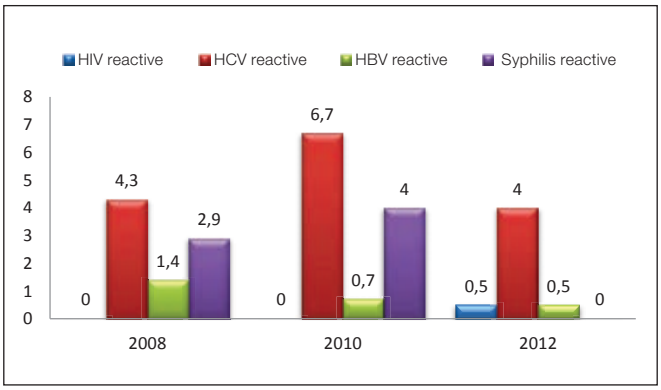
Respondents mainly have knowledge on places where they can get tested for HIV and they state the Clinic for Infectious Diseases and NGO counselling centres, but a small number of them mentions the Public Health Institutions.

Slightly more than two thirds of respondents (40,2%) have already got tested for HIV and every tenth respondent (10,1%) tested for HIV in the past 12 months knows the test results, which is slightly less comparing to the previous researches.[13,14]

Of the total number of 199 samples, one case of HIV infection, eight cases of HCV infection and one case of HBV infection were detected by using serological analysis of blood samples. Comparing to the previous two researches,

there is a decrease rate of hepatitis C and hepatitis B positivity and syphilis infections are not registered. Comparing to the previous researches, one case of HIV positive is registered (Graph 4.).

Graph 4. The rate of positive serological analysis of HIV/STI (2008, 2010 and 2012)



The results of numerous researches confirm that the key factors of risk behaviour for HIV transmission are as follows: unprotected sexual intercourse, improper use of condom, multiple sex partners, frequent change of partners, frequent and untreated sexually transmitted infections with the important role of social and biological co-factors which increase a risk exposure probability of HIV.[10-12] Namely, social climate in Bosnia and Herzegovina, as in many other countries, is negative toward that vulnerable population, limiting their rights, with accompanying effects on their psychosocial health representing an additional HIV risk factor, including limited access to appropriate services and support.

Conclusion

The study of prevalence conducted in 2012 shows a relative progress in HIV prevention comparing to 2008 and 2010 among SW: the increase of condom usage during last vaginal intercourse, but not during the oral and anal intercourses. The increasing trend of sexually transmitted infections is evident, but self-assessment of HIV risk is low. Nearly two- thirds of the respondents have never been tested for HIV, and in all three researches there is a low rate of respondents tested in the past 12 months for HIV knowing the test results. The results of serological analysis show maintenance of low prevalence of HIV/sexually transmitted infections.

The change in behaviour is obvious but still insufficient, because risks are still present (multiple partners, sexual intercourses under drug and alcohol influences, unprotected sexual intercourses with clients and steady partners etc.).

When developing prevention programmes one must keep in mind that SW population is highly stigmatized and hard to reach so it is necessary to, through acceptable communication channels, implement targeted educational and informational activities and to organize campaigns for proper use of condom with continuous raise of awareness of the risk of HIV and other sexually transmitted infections among SW population.

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Prevalencija HIV-a i drugih polno prenosivih infekcija među seksualnim radnicama u Bosni i Hercegovini

SAŽETAK

Uvod: Seksualne radnice (Sex Workers-SW) predstavljaju populaciju koja je izložena izuzetno velikom riziku za prenos virusa humane deficijencije (HIV-Human Immunodeficiency Virus) i drugih polno prenosivih infekcija. Loši socio-ekonomski uslovi u zemlji, nedovoljna obrazovanost stanovništva, visoka nezaposlenost i drugi faktori dovode do porasta prostitucije, što predstavlja veliki rizik za širenje HIV-a i drugih polno prenosivih bolesti.

Cilj rada: Cilj ovog istraživanja je bio da se procijeni prevalencija HIV/polno prenosivih infekcija među SW u Bosni i Hercegovini (BiH), te da se ispitaju znanje, stavovi i ponašanje u odnosu na HIV/polno prenosive infekcije. Dobijeni rezultati su upoređeni sa rezultatima u istraživanjima provedenim 2008. i 2010. godine.

Materijal i metode: Istraživanje je 2012.godine provedeno kao bio-bihevioralna studija kojom je obuhvaćeno 199 seksualnih radnica u pet gradova u BiH u 2012. godini. Urađeno je dobrovoljno, anonimno i povjerljivo anketiranje, a nakon informisanog pristanka i obavljenog savjetovanja, uzet je biološki materijal (krv) za laboratorijsko testiranje na HIV, hepatitis B, hepatitis C i sifilis.

Rezultati: Istraživanje je pokazalo prisustvo rizičnog ponašanja među SW, koje se prije svega odnosi na čestu promjenu partnera i česte nezaštićene seksualne odnose. Samo jedna trećina ispitanica (36,7%) koristi kondom pri svakom seksualnom odnosu sa klijentima, a 13% sa stalnim partnerom. Seksualni odnos pod uticajem alkohola ima 87,9%, a droga 36,7% ispitanica. Iako postoji rizično ponašanje, samo 11,1% ispitanica smatra da je rizik od HIV/polno prenosivih infekcija veliki, dok se 12,6% ispitanica izjasnilo da rizik ne postoji. Seksualne radnice su 13,5 puta više izložene riziku od HIV infekcije u odnosu na sve druge žene dobi od 15 do 49 godina. Rezultati laboratorijskih testiranja ukazuju na nizak nivo HIV/polno prenosivih infekcija među seksualnim radnicama u BiH.

Zaključak: Iako postoji relativan napredak u prevenciji HIV/polno prenosivih infekcija među seksualnim radnicama i učestalije testiranje na HIV/polno prenosive infekcije u odnosu na ranije periode, to nije dovoljno za održavanje niskog nivoa infekcije. Dalja istraživanja, u određenim vremenskim intervalima, bi, među ovom populacijom, omogućila praćenje vremenskog trenda HIV epidemije u BiH i bila osnova za izradu preventivnih programa.

Ključne riječi: prevalencija, HIV, polno prenosive infekcije, seksualne radnice

ORIGINAL ARTICLE

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Epidemiological Characteristics of Meningitis Caused by Mumps virus during the epidemic In the Republic Of Srpska

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ABSTRACT

Introduction: Mumps is a systemic viral infection characterized by swelling of salivary glands, especially the parotid ones. Gonads, meninges, pancreas and other organs may also be affected.

Aims of the study: The aim of this study was to analyze the epidemiological characteristics of mumps meningitis in the last epidemic of mumps in the Republic of Srpska, and to analyze the frequency of mumps meningitis and vaccination status in patients who were supposed to be vaccinated against mumps in the war and early post-war period, and also in those patients who were supposed to be vaccinated before or after this period.

Patients and Methods: The study included 175 patients divided in the experimental group (140 patients with mumps meningitis) and the control group (35 patients with serous meningitis of other etiology, probably enteroviral). We compared epidemiological characteristics of these patients and additionally we analyzed the differences in these characteristics in patients with different vaccination status.

Results: The mean age of patients in the experimental group was 20.0 years (18.0-24.5; IQ), and in the control group 7.0 years (5.0-14.0; IQ) ($p < 0.001$). Patients born between 1985 and 1996 more frequently suffered from meningitis ($p < 0.001$) caused with mumps virus than other patients in the experimental group. There was no statistically significant difference in sex distribution between patients in the experimental and control group ($p = 0.746$), nor between patients in the experimental group with previously different vaccination status ($p = 0.371$). Most patients in the experimental group didn't have data of their immunization status. The subsequent are those patients who received only one dose of vaccine, followed by unvaccinated patients and those who were vaccinated correctly.

Conclusion: The epidemic of mumps during 2011 and 2012 is a consequence of maintaining the virus in non-vaccinated population (mainly because of the omissions made during the war and early post-war period) and insufficient duration of protection after vaccination, especially in vaccination with one dose of vaccine.

Key words: mumps, meningitis, epidemic

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Introduction

Mumps is an acute, contagious, systemic viral infection characterized by of unilateral or bilateral swelling of salivary glands, especially the parotid ones. Gonads, meninges, pancreas and other organs may also be affected.[1,2] Humans are the sole reservoir for the mumps virus which is highly infectious and is spread from person to person by respiratory droplets.[3,4] The peak incidence of the disease is in late winter and early spring.[5] The infectious period lasts from 2 days prior to the occurrence of parotitis to 9 days afterwards.[6] The period of incubation (with a maximum range of 7-25 days according to different authors) is followed by a prodromal period which lasts from 3 to 5 days and is manifested by the infectious syndrome.[7,8] The evolution of mumps clinical presentation depends on the organ which is affected. The infection is asymptomatic in up to 20-30% of people, especially in children.[3] People with asymptomatic infections can transmit the virus .[9] The mumps virus induces strong cellular and humoral immune response and the infection generally leads to lifelong immunity. The reinfection is possible, but rarely.[10]

Mumps virus was the leading cause of aseptic meningitis prior to widespread use of vaccines,[11] but nowadays the leading cause of aseptic meningitis is the enterovirus with 85-95% of all viral meningitis with proven cause .[12]

In unvaccinated population, mumps virus infection usually affects children from 5 to 9 years and epidemis occur every 2-5 years.[13] The number of cases of mumps decreased after the introduction of mandatory vaccination for about 95% per year. A mild increase in the number of mumps virus infection cases was registered since the second half of 1980's and this could be explained by keeping the virus alive in unvaccinated population and the insufficient duration of protection after single-dose of mumps vaccine, which was the reason why the second dose of the vaccine was introduced to a vaccination calendar (usually pre-school).[10] The disease shifted to older age groups, adolescents and young adults.[8]

The most effective strategy of mumps prevention in community and health care settings is promoting high levels of vaccination.[4] According to the program of measures for prevention and suppression, elimination and eradication of infectious diseases in the territory of the Republic of Srpska for 2013, mandatory vaccination against measles, mumps and rubella is administered at 12 to 15 months of age. Revaccination is at the age of 6 or 7, when children start school. If vaccination or revaccination are not administered on time vaccine can be administered later, until the age of 19 at the latest. Minimum interval between doses is one month.[16]

The aim of this study

The aim of this study was to compare the epidemiological characteristics of patients with mumps meningitis and patients with serous meningitis of other, probably of enteroviral etiology, and to analyze the frequency of mumps meningitis and vaccination status in patients who were supposed to be vaccinated against mumps in the war and early post-war period, and also in those patients who were supposed to be vaccinated before or after this period.

Patients and Methods

The study is designed as a retrospective-prospective observation study. It included 175 patients treated in Infectious Diseases Clinic of the University Hospital Clinical Center Banja Luka. The patients were divided in two groups, the experimental and the control group. The experimental group was consisted of 140 patients with mumps meningitis treated from October, 2011 to December, 2012, and the control group was consisted of 35 patients with serous meningitis of other etiology, probably enteroviral, treated from June to October, 2010. In the experimental group, the diagnosis was made on the basis of epidemiological data, clinical picture, the course of the disease, blood results and cerebrospinal fluid (CSF) analysis, with additional serology tests (mumps specific IgM and IgG antibodies) and polymerase chain reaction (PCR) for detection of mumps. The diagnosis of meningitis in the control group was made on the basis of epidemiological data, clinical picture, the course of the disease, blood results and CSF analysis, with assumption that the meningitis was caused by enterovirus. That assumption was based on the number of patients and their age, the time of year when the disease appeared and on the fact that symptoms pointing to other possible etiology were not present. Etiological diagnosis of the enteroviral infection was not possible at that time.

We compared epidemiological characteristics of the patients in the experimental and control group. The listed characteristics were presented through demographic data collected from medical documentation of every patient and information of vaccination status of patients with mumps meningitis obtained from the Vaccination Centers throughout the Republic of Srpska. Additionally, we analyzed the differences in these epidemiological characteristics in patients with different vaccination status, those who were previously completely vaccinated and those who weren't. Completely vaccinated were those patients who received two doses of MMR vaccine and incompletely vaccinated were those who didn't receive any or who received only one dose of MMR vaccine.

According to the information by the Public Health Institute of the Republic of Srpska there was no regular supply of MMR vaccine in the war and early post-war period (from 1992 to 1998). That information leads to indirect conclusion of inadequate vaccination coverage for people born from

1985 to 1996. Based on the abovementioned information, we additionally divided 140 patients into two groups. The first group consisted of people born from 1985 to 1996, and the other group of those born before or after this period. We compared frequency ratio of first and second group with expected frequency ratio of these two age groups. The expected frequency ratio is ratio between total population of the first age group and total population of the second age group in Republic of Srpska, according to regular report of the Republic of Srpska, Institute of Statistics from 2010.

Results

Respondents from 19 different towns participated in the research (Table 1.) Table 1. shows frequency and percentage distribution of the place of residence for patients in the experimental and control group. The majority of patients were from Banja Luka (40.71% in the experimental, and 68.57% in the control group).

Table 1. The frequency and the percentage distribution of the place of residence in the experimental and control group of patients

Place of residence	Group			
	Experimental		Control	
	n	%	n	%
Banja Luka	57	40.71	24	68.57
Čelinac	3	2.14	0	0.00
Derventa	2	1.43	0	0.00
Gacko	1	0.71	0	0.00
Gradiška	17	12.14	1	2.86
Kneževo	7	5.00	0	0.00
Kostajnica	3	2.14	0	0.00
Kotor Varoš	1	0.71	0	0.00
Kozarska Dubica	10	7.14	0	0.00
Laktaši	3	2.14	0	0.00
Mrkonjić Grad	2	1.43	1	2.86
Nova Topola	1	0.71	0	0.00
Novi Grad	10	7.14	2	5.71
Prijedor	10	7.14	0	0.00
Prnjavor	6	4.29	3	8.57
Ribnik	1	0.71	2	5.71
Sanski Most	1	0.71	0	0.00
Sokolac	1	0.71	0	0.00
Šipovo	4	2.86	2	5.71
Total	140	100.00	35	100.00

The patients in the experimental group were from 19 different cities. Besides Banjaluka, there were 12.14% patients from Gradiška, and from Kozarska Dubica, Novi Grad and Prijedor 7.14% each. The control group consisted of patients from Banjaluka, Prnjavor, Ribnik, Šipovo, Novi Grad, Gradiška and Mrkonjić Grad.

42.14% of patients in the experimental group and 28.27% of patients in the control group confirmed that they were in contact with patients with similar symptoms. That difference between thethe groups wasn't statistically significant (p=0.142).

The mean age of patients in the experimental group was 20.0 years (18.0-24.5; IQ), and in the control group 7.0 years (5.0-14.0; IQ). This difference was statistically significant (p<0.001).

In the experimental group, 76.43% of patients were born between 1985 and 1996. According to the estimated number of population of that age in relation to the number of the rest of the population in 2010 in theRepublic of Srpska, the expected percentage of patients in that certain age in relation to all patients in the control group was 11.43%. Statistically, the patients born in that period had meningitis caused by mumps virus more frequently (p<0.001) than other patients in the experimental group (Table 2.).

Table 2. Age distribution of patients in the experimental group in relation to the expected number of patients according to the estimated population of the Republic of Srpska

Birth period	Experimental group		The expected number of patients according to the estimated number of population	
	n	%	n	%
Born from 1985 to 1996	107	76.43*	16	11.43
The rest	33	23.57	124	88.57
Total	140	100.00	140	100.00

* p<0.001 – experimental group vs. expected number of patients according to the estimated number of population

68.57% of patients in the experimental group were men, there was no statistically significant difference in gender distribution between patients in the experimental and the control group (p = 0.746). There was no statistically significant difference in sex distribution in the experimental group of patients with known vaccination status between patients who were adequately vaccinated, inadequately vaccinated or who were unvaccinated against mumps (p=0.371) (Table 3.).

For most patients from the studied group, 51.43%, immunization records were unavailable. There were 24.29% patients who received only one dose of vaccine and 17,14% unvaccinated. There were the least of patients who were correctly vaccinated, that is, 7.14 %. Data on vaccination status of patients from the studied group, born in the period from 1985 to 1996: in 55.14% of

respondents, there was no data on vaccination and only 24.3% of the subjects were vaccinated with a single dose of vaccine. Two doses of vaccine were received by 12.15% of the respondents. 8.41% of the respondents were not vaccinated at all. (n = 107)

Data on vaccination status of patients from studied groups born before 1985 or after 1996: in 39.39% of respondents, we did not have information about immunization. 33.33% of respondents were not vaccinated at all. Vaccination was done with one dose of vaccine in 24.24% of the respondents, and with two doses in 3.03% of the respondents. (n = 33).

Table 3. Sex distribution of patients in the experimental group according to their vaccination status

Sex	Vaccination of patients in the experimental group					
	Fully vaccinated		Not fully vaccinated (1 vaccination)		Unvaccinated (no vaccination)	
	n	%	n	%	n	%
Male	6	60.00	27	79.41	16	66.67
Female	4	40.00	7	20.59	8	33.33
Total	10	100.00	34	100.00	24	100.00

Discussion

The average age of patients with mumps is generally greater than the age of patients with enterovirus meningitis [22,23] and this was confirmed in our study as well. Mumps occurred in all age groups, however, adolescents and young adults aged between 15 and 24 years, who weren't correctly vaccinated, were most affected, [1,18,24] and thanks to the community immunity, they weren't exposed to wild-type.[1] Younger children still get enterovirus infections since there is no enterovirus vaccine. [24]

According to the information from the Public Health Institute of Republic of Srpska along with the information from our study, the most affected group of people during the mumps epidemic were those who were supposed to be vaccinated against mumps from 1992 to 1998, when there was no regular supply of MMR vaccine, and therefore, there was no regular vaccination. If unimmunized person is only an isolated case in the community, that person is usually protected by the community immunity, but if most of the population in the community is not immunized the risk of epidemic is significantly higher .[25]

Both mumps meningitis [2,18] and enteroviral meningitis [26] are more common in men, regarding their vaccinal status, and that was also confirmed in our study. It is known that other viral meningitis is also more common in men than women.[27] The possible reasons are that women more often have subclinical infections, or that men are likely to tolerate pain less than women, but the real reason still remains unknown. [28]

Adequate vaccination is the most important strategy for mumps prevention.[4] If 90% and more children is fully vaccinated against mumps, mumps epidemic can be prevented.[7] Vaccination failure gives contribution to the mumps outbreak[3] because in contact with wild-type of virus, not only those who weren't vaccinated would get mumps infection, but also those who were incompletely vaccinated or those who were completely vaccinated but with low titer antibodies against mumps, usually because of primary (lack of immune response to vaccine) or secondary (vaccine immunity wane over time) vaccine failure as well as the different ability of vaccine induced antibodies to neutralize different virus genotypes.[29] Those people who received only one dose of vaccine are at higher risk for mumps infection than those who received two doses of the vaccine.[30] Even people who received two doses of mumps vaccine might not be protected against mumps because of decrease in level of antibodies, which highlights the importance of heightened clinical awareness and timely reporting of suspected mumps cases. [15]

Most patients with mumps meningitis in mumps epidemic during 2011 and 2012 in Republic of Srpska were born from 1985 to 1996, which was caused by described vaccination omissions in the war and early post-war period. For most of these patients we couldn't get information about their vaccination status, which was probably the consequence of the war and population migration. All of those people who managed to receive one dose of the vaccine against mumps received it either before 1992 or with delay, after 1998, and small percentage received the second dose of the vaccine when it became available. We couldn't get information about vaccination status for great percentage of patients in the experimental group who were born before or after the period mentioned above. According to information form the Public Health Institute of Republic of Srpska, mumps vaccination in our territory has been conducted since the 80's, so the patients born before that period did not have the opportunity to receive the mumps vaccine according to the immunization schedule. All of these information show that different factors can have an impact on overall low population mumps vaccine coverage and therefore on possible mumps infection.

Conclusion

Nowadays, the patients with mumps meningitis are older than the patients with serous meningitis of other etiology, probably enteroviral. During the epidemic of mumps in 2011 and 2012 in Republic of Srpska, there were significantly more patients with mumps meningitis who were supposed to be vaccinated in the war and early post-war period than those who were supposed to be vaccinated before or after

this period. This epidemic is a consequence of maintaining the virus in unvaccinated population, mainly because of the omissions made during the war and early post-war period, and insufficient duration of protection after vaccination, especially in vaccination with one dose of the vaccine.

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Epidemiološke karakteristike meningitisa izazvanog virusom mumps-a u toku epidemije u Republici Srpskoj

SAŽETAK

Uvod: Mumps je sistemska virusna infekcija koju karakteriše otok pljuvačnih žlijezda, najčešće parotidnih, a može zahvatiti i gonade, moždane ovojnice, gušteraču i druge organe.

Cilj rada: Cilj rada je bio analiza epidemioloških karakteristika mumps meningitisa u posljednjoj epidemije mumpsa u Republici Srpskoj, te analiza učestalosti mumps meningitisa i vakcinalnog statusa kod ispitanika koji su protiv mumpsa trebali biti vakcinisani u ratnom i ranom poslijeratnom periodu, i onih koji su trebali biti vakcinisani prije ili poslije tog perioda.

Ispitanici i metode: Uključeno je 175 pacijenata podjeljenih u ispitivanu (140 pacijenata oboljelih od mumps meningitisa) i kontrolnu (35 pacijenata oboljelih od seroznog meningitisa druge, najvjerovatnije enterovirusne etiologije) grupu. Poredili smo epidemiološke karakteristike oboljelih. Dodatno su analizirane razlike u navedenim karakteristikama mumps meningitisa između oboljelih prethodno različitog vakcinalnog statusa.

Rezultati: Srednja vrijednost životne dobi oboljelih ispitivane grupe je bila 20.0 godina (18.0-24.5; IQ), a kontrolne 7.0 godina (5.0-14.0; IQ) ($p<0.001$). Oboljeli rođeni od 1985. do 1996. godine su statistički značajno više ($p<0.001$) imali mumps meningitis od ostalih oboljelih ispitivane grupe. Nije uočena statistički značajna razlika u polnoj distribuciji između oboljelih ispitivane i kontrolne grupe ($p=0.746$), kao ni između oboljelih ispitivane grupe različitog vakcinalnog statusa ($p=0.371$). Podaci o vakcinaciji za najveći broj oboljelih ispitivane grupe su bili nedostupni, zatim slijede oboljeli koji su primili samo jednu dozu vakcine, nevakcinisani te potpuno vakcinisani.

Zaključak: Navedena epidemija mumpsa tokom 2011. i 2012. godine je posljedica održavanja virusa u nevakcinisanoj populaciji, uglavnom zbog propusta nastalih u ratnim i ranim poslijeratnim godinama i nedovoljno duge zaštite nakon vakcinacije, prije svega jednokratne.

Ključne riječi: mumps, meningitis, epidemija

ORIGINAL ARTICLE

UDK 616.133-073

Influence of Age and Gender on Asymptomatic Carotid Disease

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ABSTRACT

Introduction: Stroke is one of the most severe and the most common diseases of modern man. Prevention is necessary in order to detect people who have risk factors for it.

Objective: To determine the frequency of asymptomatic carotid disease in people of different ages.

Subjects and methods: The project encompassed the part of population, that is, groups at high risk for stroke from the Republic of Srpska. 20 240 patients were examined - there were 12797 (63.23%) females and 7443 (36.77%) males.
The study protocol was created, as well as adequate software products to support all phases of project implementation such as preparation of marketing materials, doctors' appointments, building of application for doctors and nurses to record patients' data, reports, analysis and conclusion. Upon completion of the project, data were statistically processed and the analysis of obtained results was conducted.

Discussion: Pathological changes in blood vessels were noticed through the ultrasound examination of the aforementioned blood vessels of the neck and head, and the degree of narrowing of the blood vessels was determined. Furthermore, adequate measures and treatment to prevent progression of the aforementioned as well as the occurrence of stroke were applied. On the basis of the obtained data, it was concluded that the age was one of the most significant predisposing factors for the development of asymptomatic carotid disease. It was also noted that females were, more than men, prone to developing carotid asymptomatic disease.

Conclusion: Average stenosis of all respondents was 18.36% (in females, stenosis was approximately 3.92% lower and it was 16.92%, when compared to males - 20.84%). Overall median was 16% (in females 15% and it was 5% lower than in men - 20%).

Keywords: ultrasound of the blood vessels of the neck and head, prevention, age, gender

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Introduction

Stroke is one of the most difficult and the most common diseases of modern man and it is the cause of death in over 4.5 million people. Due to the consequences of the stroke (the third cause of mortality and the first cause of disability of modern man), it is very important to prevent the occurrence of the one.[1] Due to the prevention, detection of people who have risk factors for stroke (high blood pressure, diabetes, heart disease, high blood lipids, smokers, obese people, people whose family members had a stroke, and people exposed to stress) is required, as well as detection of pathological changes in the blood vessels of the head and neck which by treating them, can lead to preventing the occurrence of the stroke.[2-7]

Approximately 40 - 60% of strokes occur due to pathological changes in the blood vessels of the head and neck,[8] and therefore, an early detection and beforehand treatment of the same is necessary. The aforementioned changes can be detected by auscultation of blood vessels, ultrasound examination, CT angiography, NMR angiography, and conventional angiography. Taking into consideration the advantages and disadvantages of the aforementioned diagnostic methods, ultrasound examination of blood vessels, by its characteristics, is considered to be "the method of choice".[9-11]

Ultrasound examination of blood vessels is of high importance in detection of asymptomatic carotid disease which implies a state in which pathological changes in blood vessels are expressed while subjective obstructions and neurologic disorders are absent.[12,13] The annual risk of stroke ranges from 2 to 5% for patients with significant asymptomatic carotid lumen stenosis (greater than 70%).[14,15] Early detection of patients with asymptomatic carotid stenosis allows the application of carotid endarterectomy and carotid stenting.[16] According to various authors, data on the prevalence of asymptomatic carotid occlusive disease vary. High-grade asymptomatic carotid stenosis causes a disturbance in cognitive functioning of the patient. In the study conducted by Balestrini, 210 patients who had high-grade stenosis were examined. The study results showed that the high-grade carotid artery, although in its asymptomatic phase, caused increased level of cognitive deterioration.[17-21]

In the Republic of Srpska there is a large number of people with commonly called risk factors for stroke and they are not in the position to do the ultrasonic testing. This project enabled the residents to have a chargeless and fast ultrasound screening of the blood vessels of the neck and head, and therefore, the prevention of stroke.

Aim

The aim of this study is to detect pathological changes in the blood vessels of the head and neck and to prevent stroke in people who have risk factors for it (high blood pressure, diabetes, heart disease, high blood lipids, smokers, obese people, people whose family members had a stroke, and people exposed to stress), i.e. to determine the frequency of asymptomatic carotid disease in the population based on a random sample of patients who have undergone the ultrasound examination of the blood vessels of the neck. Furhtermore, the aitm is to determine the influence of age and gender on the frequency of asymptomatic carotid disease.

Patients and methods

This prospective study was conducted on the whole teritory of the Republic of Srpska. From 2012 to 2014, 20 240 patients were tested. There were 12 797 (63.23%) females and 7443 (36.77%) males. All respondents who had asymptomatic stroke (AS) and transient ischemic attack (TIA) were not included in the project. Before the examination, each patient completed standardized questionnaire with data on marital status, education, personal and family history of previous stroke or TIA, heart disease, diabetes, hypertension, smoking and alcohol. After completing the questionnaire, the ultrasound examination of the blood vessels of the neck on both sides was done. All the procedures were standardized and performed by particularly trained researchers.

Ultrasound examination was performed in patients in the supine position - on the back. This way we were able to review the common carotid artery, bifurcation and the internal and external carotid artery in all patients. Ultrasound machine vivid 5 with a probe of 7 MHz was used. IMK was measured on the basis of the adopted IMK definitions, and, if it was greater than 1 mm, it was indicated as pathological. In the case of the plaque occurrence, the same was measured according to NASCET criteria.

Results

During three-year period, 20240 patients were examined - there were 12797 (63.23%) females and 7443 (36.77%) males. The youngest respondent was 18 year-old (both genders), while the eldest respondent, a female, was 93 years old (Table 1.).

Table 1. Age of the respondents according to gender

Gender	N	Minimum	Maximum	Range	Median	Mean	Std. Dev.
Male	7443	18	90	72	59.00	57.36	12.437
Female	12797	18	93	75	56.00	55.25	11.722
Total	20240	18	93	75	57.00	56.03	12.033

By using the Mann-Whitney U test, there was a highly, statistically significant difference (z = -13.368, p = 0.000) in the age of the respondents in relation to the gender of the respondents.

Bearing in mind that 63.23% of the examined respondents were female and observing the age of the respondents according to groups, it was noticed that the female respondents were over-represented in the following age groups: 21 to 30 years (63.25%), 31 to 40 years (65.40%), 41 to 50 years (68.67%) and 51 to 60 years (66.27%). The degree of stenosis was present from 0 to 100% (both sexes). The average stenosis of the respondents was 18.36% (stenosis in females was on average 3.92% lower, that is, 16.92% when compared to males - 20.84%). Overall median was 16% (15% in females and it decreased by 5% when compared to males - 20%).

By using the Mann-Whitney U test, there was a highly statistically significant difference in the degree of stenosis in females (Md = 15.00, N = 12797) and males (Md = 20.00, N = 7443); z = -19147, p = 0.000. The examination of the degree of stenosis of the carotid basin in groups showed that the majority of patients (11 747 or 58.0%) referred to the group of 0% to 19% of blockage, out of which 3716 (49.9% of all male respondents) were males and 8031 (62.8% of all female respondents) females. Based on frequency, the succeeding group was that of 20% to 49% of blockage - 7740 (38.2%) patients, that is, 3315 males (44.5% of all male respondents) and 4425 females (34.6% of all female respondents).

The degree of stenosis of the carotid area less than 50% occurred in a total of 19 487 (96.3%) patients, 7031 males (94.5% of all male respondents) and 12456 females (97.3% of all female respondents). Over 50% of blockage occurred in 753 (3.7%) respondents, i.e. 412 males (5.5% of all male respondents) and 341 females (2.7% of all female respondents) - Table 2.

Table 2. The degree of stenosis/group according to gender

The presentage of stenosis /groups/ cartoid artery		Gender		Total
		Male	Female	
0-19%	N	3716	8031	11747
		49.9%	62.8%	58.0%
20-49%	N	3315	4425	7740
		44.5%	34.6%	38.2%
50-69%	N	293	257	550
		3.9%	2.0%	2.7%
70-99%	N	84	62	146
		1.1%	0.5%	0.7%
100%	N	35	22	57
		0.5%	0.2%	0.3%
Total	N	7443	12797	20240
	100.0%	100.0%	100.0%	

Considering the presence of stenosis / group / according to gender, a greater presence of low levels of stenosis in females was evident (68.37% in the presence of stenosis from 0% to 19%, and 57.17% in the presence of stenosis of 20% to 49%). In the presence of stenosis, more than 50% higher prevalence was in males (53.27% in the presence of stenosis of 50% to 69%, 57.53% in the presence of stenosis from 70% to 99%, and in the occlusion - 61.40%).

At the percentage of stenosis from 0% to 19%, by testing all the patients, there was a highly statistically significant difference (p = 0.000) of the presence of stenosis in relation to gender (greater representation in female respondents). By monitoring the age groups in relation to gender, there was highly statistically significant difference in the following age groups - from 41 to 50 years (higher prevalence in females, p = 0.000); from 51 to 60 years (higher prevalence in females, p = 0.000) and from 71 to 80 years (higher prevalence in males, p = 0.001). However, there was a statistically significant difference in the following age groups - from 31 to 40 years (higher prevalence in females, p = 0.020); from 61 to 70 years (higher prevalence in females, p = 0.013) and more than 80 year (higher prevalence in males, p = 0.030). (Table 3.).

Table 3. Statistical significance and the presence of the degree of stenosis according to groups, age groups and gender

Age groups		Gender		Total	p
The percentage of stenosis		male	female		
<= 20	0 – 19%	12 /11/	18 /19/	30	0.714
21 - 30	0 – 19%	190 /190/	327 /327/	517	0.993
31 - 40	0 – 19%	600 /647/	1158 /1111/	1758	0.020*
	20 – 49%	21 /14/	16 /23/	37	0.012*
	Total	621 /661/	1174 /1134/	1795	0.056
41 - 50	0 – 19%	877 /1086/	2075 /1866/	2952	0.000**
	20 – 49%	202 /184/	299 /317/	501	0.102
	50 – 69%	4	1	5	
	70 – 99%	1	0	1	
	100%	0	1	1	
	Total	1084 /1272/	2376 /2188/	3460	0.000**
51 - 60	0 – 19%	1248/1580/	3046 /2714/	4294	0.000**
	20 – 49%	1048 /952/	1538 /1634/	2586	0.000**
	50 – 69%	51 /35/	45 /61/	96	0.001**
	70 – 99%	12 /8/	10 /14/	22	0.084
	100%	4 /3/	4 /5/	8	0.438
	Total	2363 /2576/	4643 /4430/	7006	0.000**
61 - 70	0 – 19%	633 /685/	1228 /1176/	1861	0.013*
	20 – 49%	1292 /1100/	1697 /1889/	2989	0.000**
	50 – 69%	123 /82/	99 /140/	222	0.000**
	70 – 99%	36 /21/	21 /36/	57	0.000**
	100%	19 /10/	8 /17/	27	0.000**
	Total	2103 /1896/	3053 /3260/	5156	0.000**

Age groups		Gender		Total	p
The percentage of stenosis		male	female		
71 - 80	0 – 19%	143 /115/	170 /198/	313	0.001**
	20 – 49%	659 /537/	801 /923/	1460	0.000**
	50 – 69%	100 /74/	101 /127/	201	0.000**
	70 – 99%	31 /21/	27 /37/	58	0.008**
	100%	10 /6/	7 /11/	17	0.059
	Total	943 /753/	1106 /1296/	2049	0.000**
> 80	0 – 19%	13 /8/	9 /14/	22	0.030*
	20 – 49%	93 /61/	74 /106/	167	0.000**
	50 – 69%	15 /10/	11 /16/	26	0.027*
	70 – 99%	4	4	8	
	100%	2	2	4	
	Total	127 /83/	100 /144/	227	0.000**
Total	0 – 19%	3716 /4323/	8031 /7424/	11747	0.000**
	20 – 49%	3315 /2848/	4425 /4892/	7740	0.000**
	50 – 69%	293 /202/	257 /348/	550	0.000**
	70 – 99%	84 /54/	62 /92/	146	0.000**
	100%	35 /21/	22 /36/	57	0.000**
	Total	7443	12797	20240	

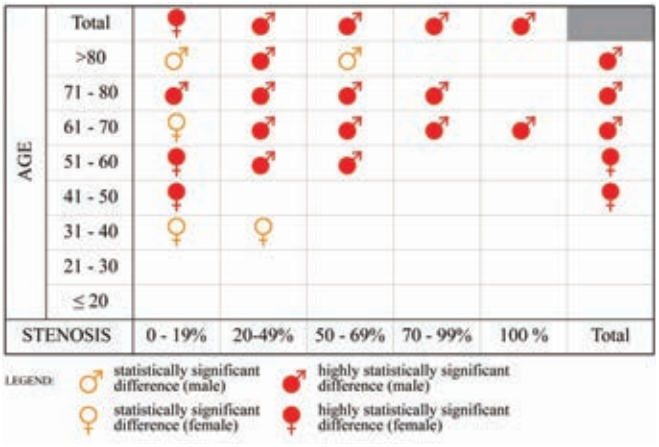
By monitoring all the patients, in the case of the degree of stenosis from 20 to 49%, there was a highly statistically significant difference (p = 0.000) in the presence of stenosis in relation to gender (greater representation in male respondents). By monitoring the age groups with respect to gender, there was highly statistically significant difference for all age groups over 50 years (higher prevalence in males, p = 0.000), as well as statistically significant difference in the age groups from 31 to 40 years (higher prevalence in males, p = 0.012) (Table 3.).

By monitoring all the patients, in the case of the degree of stenosis of 50% to 69%, there was a highly statistically significant difference (p = 0.000) in the presence of stenosis in relation to gender (higher representation in male respondents). By monitoring the age groups with respect to gender, there was a highly statistically significant difference in the age groups from 51 to 60 years (higher prevalence in males, p = 0.001); from 61 to 70 years (higher prevalence in males, p = 0.000), and from 71 to 80 years (higher prevalence in males, p = 0.000), as well as a statistically significant difference in the age group above 40 years old (higher prevalence in males, p = 0.027) (Table 3).

By monitoring all the patients, in the case of the degree of stenosis of 70% to 99%, there was a highly statistically significant difference (p = 0.000) in presence of stenosis in relation to gender (higher representation in male respondents). Throughout monitoring the age groups with respect to gender, a highly statistically significant difference was noticed in the following age groups: from 61 to 70 years (higher prevalence in males, p = 0.000); from 71 to 80 years (higher prevalence in males, p = 0.008).

In the case of complete blockage of the carotid arteries (occlusion) and throughout monitoring all the patients, there was a highly statistically significant difference (p = 0.000) in the presence of occlusion in relation to gender (higher representation in male respondents). Throughout monitoring the age groups with respect to gender, a highly statistically significant difference was noticed for the age group of 61 to 70 years (higher prevalence in males, p = 0.000).

Figure 1. The statistical significance of the presence of stenosis according to groups, age groups and gender



Regarding the lower degrees of stenosis, more than expected number of cases occurred in females, while at the higher degree of stenosis, more than expected number of cases occurred in males, as well as in age groups - at lower age groups (younger), more than expected number of cases occurred in females, and in the higher age groups (older), more than expected number of cases occurred in males. (Figure 1.).

Discussion

Stroke is the leading cause of death and hospitalization in both males and females in almost every European country and the third cause of death in the United States. Carotid disease is one of the most important causes of stroke.[1-4] Studies have shown that the annual risk of stroke in patients with asymptomatic carotid disease varies from 2 to 5% in the case of patients with severe asymptomatic carotid stenosis. The importance of carotid atherosclerosis is widely recognized because of its correlation with coronary atherosclerosis and other cardiovascular risk factors.[4-7]

The prevalence of severe stenosis was noticed in males, more than in females, at the age of 70. In the case of patients older than 70 years, the difference is higher. The prevalence of males in that age was 12.5% and of females 6.9%. In Beks and associates' study,[22] the prevalence of any detectable lesions in males was 25.4%, and 26.6% in females. The degree of stenosis increased with age.[22]. The

analysis of the frequency of carotid disease by gender showed that before the sixth decade of life, there was almost doubled prevalence of carotid disease in females than in males. However, after the seventh decade, the difference was almost balanced.[22]

In Fabris and associates' study[18] , on the sample of 457 patients aged 18-97 years, a positive findings of the existence of atherosclerotic plaques in 178 patients, or 38.9% of the patients were noticed. According to this author, the prevalence of carotid disease was 45.4% in males and 32.3% in females.[18] Also, this author recognized a higher prevalence in males than in females which increased with age (prevalence in the group of patients 65-74 years was 59.9% , and in the group over 75 years, 76.7%).[18] The abovementioned author also recognized post-menopausal hormonal changes that led to increased atherosclerosis in females as the most probable cause for that phenomenon.[18] Not only did the frequency, but the severity of carotid disease progressed with age as well.[18] Average percentage of stenosis at the point of maximum stenosis was 9.1% in the age group from 45 to 64 years, 17.3% in the age group of 65-74 years and 27.1% in patients aged over 75 years.[18]

Similar results were obtained in our study. The average stenosis of all the respondents was 18.36% (stenosis was 3.92% less in females and was 16.92%, when compared to males - 20.84%). Considering the presence of stenosis / group / according to gender, a greater presence of low levels of stenosis in females was evident. In the presence of stenosis, more than 50% higher prevalence was in males. The presence of significant stenosing plaque in the carotid increased in accordance with the age.

Conclusion

The incidence of moderately severe carotid artery stenosis increases with age, more frequently in males than in females women.

By establishing the ultrasound examination as required screening method for patients of certain age range, the occurrence of stroke in elderly people could be prevented.

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Uticaj životnog doba i pola na karotidnu asimptomatsku bolest

SAŽETAK

Uvod: Moždani udar je jedna od najtežih i najčešćih bolesti savremenog čovjeka. Prevencije je potrebna za detekciju osoba koje imaju faktore rizika za nastanak moždanog udara.

Cilj rada: Utvrditi učestalost asimptomatske karotidne bolesti kod osoba različite životne dobi.

Ispitanici i metode: Projektom je obuhvaćen dio stanovništva koje pripada rizičnim grupama za dobijanje moždanog udara sa područja Republike Srpske. Pregledano je 20240 pacijenata – 12797 (63,23%) ženskog i 7443 (36,77%) muškog pola. Kreiran je Protokol studije i izrađeni su adekvatni softverski proizvodi kao podrška svih faza realizacije projekta: priprema reklamnih materijala, zakazivanje pregleda, izrada aplikacije namijenjene ljekarima i medicinskim sestrama za evidentiranje podataka o pacijentima, izvještavanje, analiza i zaključivanje.Nakon završetka projekta statistički su obrađeni podaci i izvršena je analiza dobijenih rezultata.

Diskusija: Ultrazvučnim pregledom krvnih sudova vrata i glave, otkrivene su patološke promjene u navedenim krvnim sudovima, određen jestepen suženja krvnih sudova, primijenjene su adekvatne mjere i tretman radi sprečavanja napredovanja istih i onemogućavanja javljanja moždanog udara.Na osnovu dobijenih podataka zaključeno je da je životna dob jedna od najznačajnijih predisponirajućih faktora za razvoj karotidne asimptomatske bolesti. Takođe je primjećeno da su žene sklonije razvoju karotidne asimptomatske bolesti od muškaraca.

Zaključak: Prosječnastenozasvihispitanikaje18,36% (kod ženskogpolastenozajeprosječnomanja 3,92% i iznosila je 16,92%, uodnosunamuškipol–20,84%). Ukupnamedijanaje 16% (kod ženaje 15% i za 5% je manja u odnosu na muškarce – 20%).

Ključne riječi: ultrazvučni pregled krvnihsudovavrataiglave, prevencija,starost, pol

ORIGINAL ARTICLE

UDK 377/378::614.253.5

Attitudes and Opinions of Health Care Students of Medical Faculty in Banja Luka about Study Program and Nursing as a Profession

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ABSTRACT

Introduction: The level of education quality of medical health care graduates (Bachelors of Health care and Nursing) depends on curriculum quality. Knowing what motivates students to enroll medical health care studies and development of professional and academic career are of great importance for education as well as the practice.

Aim of the study: To see if there is a difference in attitudes and opinions between 1st year students and 4th year students about health care study program and nursing as a profession, students motivations for enrolling the program and their expectations about possibilities to develop personally, professionally and scientifically after graduating.

Patients and Methods: 55 Health care students of Medical Faculty University of Banja Luka (1st year 37 and 2nd year 18 students) were a sample. Research was conducted by using anonymous, original questionnaire which was written for the needs of this research. SPSS (Statistical Product and Service Solutions) version 20. was used for data processing, and Windows, operating system, for data analysis.

Results: Conducted research shows that material component, with possibility of finding better job and willingness to care for other people are major criteria which motivate students to choose nursing study. Health care students of both generations graded study program with 3,22 ± 0,76, and there was statistically significant difference ($p<0.001$) concerning access to literature and companion paper. Both generations of students have positive attitudes about nursing as a profession. Majority of the students (1st year = 77,8%; 4th year = 75,7%) showed interest for further academic development after graduating the study of Health care. A large number of students chose going abroad (1st year 67,6% ; 4th year 77,8%), whereas minority of the students have desire to stay in their own country after graduating.

Conclusion: Motives for enrolling the study of Health care in this country and in other countries have no significant differences, and the most frequently cited reasons are possibility of finding better job, and desire to help other people. Academic study program of Health care should be extremely high-quality and alluring enough to draw attention of young students as well as the older students.

Key words: nursing, students' attitudes, enrolling motives, expectations

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Introduction

Medical Faculty University of Banja Luka founded Health care study program in school year 2007/08. Title which is gained after finishing this study program is Bachelor of Health care and Nursing.

Recommendations of American Institute for medicine point that it is necessary to enable education for nurses who are not college-educated and it is expected that 80% of nurses will be college-educated by 2020.[1]There are strong recommendations of international professional boards, organizations and state regulations that nurse education should be raised to university level.[1-4]

Level of education quality of medical health care graduates depends on curriculum quality. Integrative study conducted by literature review shows quality of nursing curricula which were published during a period of forty years. This study shows that only eight out of 27 studies include students' opinions about curriculum. The results point that there are significant limitations which are related to quality level improvements of curricula. [5] Education programs for nurses must be based on constant monitoring and self-evaluation of work and cognitive research.[2] Health care students should be theoretically and practically qualified for performing health care procedures within their competence.[6]

When we talk about motives for enrolling health care studies in other countries, there are many reasons, and the most common motives are willingness to help others, possibility of finding better job, and possibility for further career development and financial motivation.[7-9]

In our country there is not knowledge about students motives for enrolling health care studies as well as their expectations for their personal, professional and scientific development of nurses after graduating.

Aim of the study

To see if there is a difference in attitudes and opinions between 1st year students and 4th year students about health care study program and nursing as a profession, students motivations for enrolling the program and their expectations about possibilities to develop personally, professionally and scientifically after graduating.

Patients and Methods

All respondents were 1st year and 4th year students of Health care students of Medical Faculty University of Banja Luka. 55 students were involved in the research (1st year 37 (67%) and 4th year 18 (33%) students). Research was conducted in December 2014, during regular classes.

For the needs of this research, original questionnarie was constructed on the basis of important literature review, and research was conducted by anonimus questionnarie which was given to students.

Questionnaire was made of 25 questions, divided into three parts:

I part – included questions about respondents' sociodemographic characteristics (7 questions)

II part – included questions about attitudes and opinions of Health care students (8 questions)

III part - – included questions about attitudes and opinions of students about nursing as a profession (10 questions)

Offered answers were represented by Likert scale in the range of 1-5 (1 – I disagree completely, 5 – I agree completely). Respondents had to answer YES or NO to other claims. Questionnaries were personally handed by researches to the repondents with detailed explanation of research aim and methods how to fill the questionnarie. Permission to conduct this research was granted by the competent institution.

Results

There are 37 respondents out of 59 students (63%), generation of 2014/15 school year, and there are 18 respondents out of 25 students (72%), generation of 2010/11 school year. By gender, there are more females: F = 46 (83,6%), M = 9 (16,4%).

Generation of 2010/11 school year has the biggest number of respondents who are within the age group of 23 to 27 (44%), and the smallest number of respondents who are within the age group of 33 to 37 (6%), and generation of 2014/15 school year has the biggest number of respondents who are within the age group 18 to 22 (97%), only 3% those who are within the age group of 23 to 27, $t(53) = 6.23$, $p=0.000$. The largest number of respondents finished medical high school -50, 9%, and than those who finished high-school (gymnasium) 25, 5 %, and 23, 6% of students who finished other high schools. Of total number of respondents 56, 4% finished high school in 2014 (2011,9 ± 3,3). Among the respondents there is a majority of those who are unemployed (96, 4%).

Respondents of Health care study program of Medical Faculty University of Banja Luka agree the most with the claim that they will find a better job after graduating Health care studies (I year 81,1%; IV year, 66,6%) and with the willingness to help other (1st year, 78,4%; 4th year, 72,2%). Students do not agree with the claim of inability to enroll what they wanted at first (1st year, 18,9% ; 4th year, 16,7%).

Table 1. Students' attitudes and opinions about health care study program

	1st year		4th year		t-testa	
	$\bar{x}$	SD	$\bar{x}$	SD	t	p
Evaluation of health care study program	3.3	0.661	3.06	0.938	1.106	0,274
Top quality practical training	3.22	1.004	3.06	1.259	0.512	0.611
Availability of professional literature	3.43	0.867	2.5	1.098	3.424	0.001

[a]d.f. = 55

Ranking of mean values: 1 = very low; 5 = very high

p <0.05 is considered statistically significant (in bold)

Results of the attitudes and opinions of health care students' research are compared by the T-test of the independent samples **(Table 1.)**. There was not statistically significant difference in evaluating health care study program and top quality practical training between 1st year students and 4th year students. There is statistically signicicant difference regarding availability of professional literature among 1st year students (3.43 ± 0.87) and 4th year students (2.5 ± 1.19); t (55) = 3.42, p = 0.001 (mutual). Students had professional and scientific advancement in their expertise **(Table 2.)**.

Table 2. Students' attitudes and opinions about professional and scientific improvement of nurses

	1st year		4th year		t-testa	
	$\bar{x}$	SD	$\bar{x}$	SD	t	p
Competences acquired in the study of health care are used at new work and for the purporse of promotion at work	2.38	0.721	2.50	0.857	0.552	0.584
Bachelor of science in nursing contributes to the professional and scientific progress of nurses	1.86	0.585	2.00	0.594	0.800	0.427
Nurses or medical technicians can reach the highest level of progress during their professional lives	1.70	0.571	2.28	1.127	2.04	0.054
Research is really important for the advancement of profession and for functioning the entire health system	1.86	0.631	1.94	0.998	0.361	0.720

[a]d.f. = 55

p <0.05 is considered statistically significant

There was not statistically significant difference between 1st year and 4th year students p>0.05 in their opinions and attitudes about professional and scientific advancement of nurses.

Majority of health care students (1st year = 77,8%; 4th year = 75,7%) showed interest for further academic progress in field of nursing after graduating health care study program. Students had their opinion about nursing profession **(Table 3).**

Table 3. Students' attitudes and opinions about nursing as a profession

	1st year		4th year		t-testa	
	$\bar{x}$	SD	$\bar{x}$	SD	t	p
Nursing is really complicated and demanding job	1.27	0.45	1.11	0.32	1.50	0.14
In health institutions nursing functions in the frame of relative autonomy	3.19	0.78	3.61	0.85	1.83	0.07
Other members of the team appreciate nurses as experts	3.43	1.04	3.67	0.97	0.80	0.43
Nursing is exclusively female profession	4.14	0.86	3.83	0.71	1.30	0.20
Media show the work of nurses adequately	3.46	0.90	3.56	0.78	0.39	0.70
Nursing is appreciate profession in Rebulic of Srpska	3.97	0.96	4.17	0.79	0.74	0.46
Nurses should participate in creating health policy	1.08	0.28	1.00	0.00	1.78	0.08

[a]d.f. = 55

p <0.05 is considered statistically significant

There was not statistically significant difference between 1st year and 4th year students in their opinions and attitudes about nursing as a profession (p<0,05).

92.7% of respondents consider that nurses or medical technicians are not adequately paid for the work they do.

In relation to the degree of interest for performing tasks most of the students chose to work in their profession as Bachelors of Health care and Nursing (1st year 40.4%; 4th year 55.6%), and for managerial job as head nurse (1st year 43,2%; 4th year 27.8%). There is great interest among students for teaching (1st year 18.9%; 4th year 27.8%). There is not statistically significant difference between 1st year and 4th year students concerning abandonment of nursing profession (t = 1.28, p = 0.21).

Most of the students chose to work abroad after graduating (1st year 76.6%; 4th year 77.8%).

Discussion

Results of our research show that there is statistically significant difference between the ages of respondents ($p<0.001$). Majority of the tested 1st year students was at the age of 18 to 22, and majority of the 4th year students was at the age of 23 to 27. Distribution by gender of both generation points that there is significantly larger number of females. According to the data from the literature, females, in their middle ages, are more likely to choose nursing as a profession compared to men. Age difference significantly affects the motives and expectations of the students. Students, who are a bit older than the average, accepts new knowledge, and younger students contribute significantly to constant scientifically and professional progress in nursing.[7] In conducted research (96,4%) of the students are unemployed. Others researches show that employment among students is significantly higher, and that their employment has little affect on their academic achievements.[7,9,12]

In our study half of the studets finished medical high school, whereas the study coducted in Bahrian (2012) shows that all students who enroll the studies have degree from medical high school.[8]

As for the criteria that motivate studets to choose nusring study, the dominant factor is said to be material component with possibility of fiding better job. There is also great willingness to help others. Data from the literature point similar motives for enrolling nursig study.[7-10] In coutries around the world there is obvious deficit of nurses which enables people in this profession to find jobs fast and more easiely and also to have long time position .[11]

Longitudinal research on the evaluation of nursing curriculum at Southern Cross University in Australia points that average grade was from 3.89, in 2006, to 4.00, in 2008.[12] Health care students evaluated curriculum and the quality of the practical work of teaching with 3,22 ± 0,76. For students to give higher evaluation of curriculum, it is neccessary to work to improve curriculum which would ultimately mean better education.

Both generations of students showed great interest for further academic progress in graduate health care studies. Data from the literature point similar results.[7,8,13] Further academic progress contributes to professional and scientific improvement of nurses, and it also justifies the introduction of doctoral studies for nurses in our country. Majority of the students is ready to work as nurses after graduating without thinking of leaving nursing profession. Other researches show that there are different interests among students, but majority of them decides to stay in nursing profession.[13-15]

The importance and role of Bachelors of Health care and Nursing are still not enough recognized.

In order to promote health care as better as possible, it is necessary to make development health care strategy and involve nurses who have positive attitudes. Health care students have positive attitude about nursing, but at the same time they think that nursing is not appreciated profession in Republic of Srpska. These results indicate the results of similar studies.[9, 14-16]

Health care students mostly dissagree that nursing is female profession, although there is dominance of females. Similar results are obtained in other researches where students defended the idea that gender should not be the key factor in the choice of profession.[18,19]

However, the study of Karabacak and associates (2012) found that male health care students are differently perceived by the public in relation to female students, because it had long been believed that nursing was exclusively female profession.[20]

In a survey conducted among doctors and nurses both groups of respondents estimated to have a low level of personal involvement in their organizations and insufficient participation in work teams, and nurses considered themselves to be inferior to physicians.[21] Research conducted in Italy suggests that nurses throughout history did not have rights similar to other health care professionals.[22] The results of our study show that nursing in health care institutions does not operate within the framework of autonomy and that nurses should be more involved in policymaking. This result could explain the numerous problems in nursing: the low status of health care, poor financial status of nurses, unregulated issue of education and vocation of nurses, as well as poor motivation for improving the quality of health care.

When we asked:"Where would you like to work after graduating?", majority of students chose to go and work abroad (1st year 67,6% ; 4th year 77,8%), while a smaller number of students expressed a desire to remain in their country. Similar results were obtained in studies conducted in different countries.[7,13-16] So far, establishing a European labor market for occupations in the health sector has not led to extensive migration among the EU member states. However, in the coming years the mobility of health professionals is expected to increase. The motives of health professionals to leave their country can be attributed to low wages, poor working conditions, undefined competence, lack of health resources and limited opportunities for career advancement.[23]

Conclusions

The results of this research showed that the motivations of enrollment of health care in our country and other countries do not differ significantly. The dominant factor is said to be material component with possibility of fiding better job. There is also great willingness to help others.

Students generally expressed a positive attitude about nursing as a profession and evaluated study program with a relatively high grade, while 1st year and 4th year students' opinions were divided in terms of available nursing literature.

The results show that it is necessary to try to improve curriculum in accordance with the needs of the labor market and European guidelines for study program to have better quality and to draw attention of younger and older students.

This research shows that the implementation of longitudinal studies with 1st year students at the end of their schooling, with the same measuring instrument, would give a more complete picture of the health care study.

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Stavovi i mišljenja studenata zdravstvene njege Medicinskog fakulteta u Banjoj Luci o studijskom programu i sestrinstvu kao profesiji

SAŽETAK

Uvod: Stepen kvaliteta obrazovanja diplomiranih medicinara zdravstvene njege zavisi od kvaliteta nastavnog plana i programa. Saznanja o onom šta motiviše studente za upis na studij zdravstvene njege i razvoj stručne i akademske karijere od izuzetnog su značaja, kako za obrazovanje, tako i za praksu.

Cilj rada: Ispitati da li postoji razlika u stavovima i mišljenjima studenata I i IV godine o studijskom programu zdravstvene njege, sestrinstvu kao profesiji, motivima upisa studenata, kao i njihovim očekivanjima u vezi sa mogućnostima ličnog, stručnog i naučnog napredovanja nakon završenog studija.

Ispitanici i metode: Uzorak su činila 55 studenta zdravstvene njege Medicinskog fakulteta Univerziteta u Banjoj Luci (I godina 37 i IV godina 18 studenata). Istraživanje je sprovedeno upotrebom anonimnog, originalnog anketnog upitnika koji je konstruisan za potrebe ovog istraživanja. Za obradu podataka korišten je SPSS (Statistical Product and Service Solutions) verzija 20.Windows, operativni program za analizu podataka.

Rezultati: Sprovedeno istraživanje ukazuje da su materijalna komponenta, uz mogućnost nalaženja boljeg posla i spremnost da se brinu o drugim ljudima, glavni kriteriji koji motivišu studente da izaberu studij sestrinstva. Studenti obe generacije zdravstvene njege ocijenili su studijski program sa ocjenom 3,22 ± 0,76, a postojala je statistički značajna razlika ($p<0.001$) u pogledu dostupnosti literature. Obe generacije studenata imaju pozitivne stavove o sestrinstvu kao profesiji. Većina studenata (I godina = 77,8%; IV godina = 75,7%) pokazala je interes za dalje akademsko napredovanje nakon završetka studija zdravstvene njege. Za odlazak u inostranstvo opredijelio se veliki broj studenata (I godina 67,6%; IV godina 77,8%), dok je manji broj njih izrazio želju da ostane u svojoj zemlji nakon završenog studija.

Zaključak: Motivi upisa na studij zdravstvene njege kod nas i u drugim zemljama bitno se ne razlikuju, a najčešće navođeni razlozi su mogućnost boljeg zaposlenja i želja za pomoć drugima. Akademski program studija zdravstvene njege morao bi biti izuzetno kvalitetan, ali i dovoljno atraktivan kako bi privukao studente mlađe i starije životne dobi.

Ključne riječi: studij sestrinstva, stavovi studenata, motivi upisa, očekivanja.

PROFESSIONAL PAPER

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Omphalocele and gastroshisis: a 14-year study

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ABSTRACT

Introduction: Omphalocele and gastroschisis are developmental defects of the anterior abdominal wall, which have only recently been categorized as separate entities. In both cases, it is a herniation of abdominal organs through appropriate defects of the anterior abdominal wall. It is considered that the omphalocele are quite often developmental anomalies and are often associated with other developmental disorders, unlike gastroschisis, which usually occur isolated.

Aims of the study: To determine the frequency of cases of omphalocele and gastroschisis in the Clinical Center of Banja Luka in the period from 2000 to 2013.

Patients and methods: Insight into medical records, a retrospective analysis of all cases of congenital defects of the anterior abdominal wall at the Clinical Center of Banja Luka was done from the year 2000-2013. The analysis included all cases of omphalocele and gastroschisis, and prematurity, associated anomalies, the rate of mortality in the first year, exposure to environmental factors during pregnancy, maternal diabetes, maternal age, and familiar occurence of these anomalies were taken into consideration. Cases of „the prune belly“ syndrome and umbilical hernia were not included in this research.

Results: During the period 2000-2013, there was a total of 19 cases of omphalocele, of which eigth live births. In the same period there was 14 cases of gastroschisis, and there was seven children born alive with this defect. In 73 percent of omphalocele cases there was associated anomalies, while this rate at gastroschisis was significantly lower and amounted to 28 percent. Among the live births, prematurity rate was 37.5 percent for the omphalocele group and 57 percent for the group of gastroschisis. The mortality rate in the first year of life was 25 percent for omphalocele and 14 percent for gastroshisis. In all these cases, the cause of death was not directly related to abdominal defect, but the associated complications (respiratory distress in the first place). Half of the mothers from both groups stated that they had used some medicines or consumed cigarettes during pregnancy. There was also a single incident of gestational diabetes in the group of omphalocele and one case of a positive family history from the gastroschisis group.

Discussion: In this study, the relation of omphalocele and gastroshisis was 19/14 or 1.3:1, compared to the expected 3:2 ratio in the world literature. Other studies around the world show a higher incidence of gastroschisis and lower incidence of omphalocele. We had no reported cases of stillbirths in omphalocele group although, in the world literature, data of 11-12 percent were noticed . The reason for this discrepancy could be a different criteria for stillbirth compared to abortion, and perhaps the reporting was biased. The percentage of associated anomalies was higher in group of omphalocele, and similar results were reported in other studies. The mortality rate in thefirst year of life in a group of omphalocele was much higher when compared to gastroschisis group. For unknown reasons, stillborn children with omphalocele were not represented in this study.

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Conclusion: 33 patients with omphalocele and gastroschisis, treated in this study, confirmed the world's medical reports that the incidence of gastroschisis increased when compared to omphalocele. These statistics should have an impact on the textbooks which still represent omphalocele as a significantly more frequent anomalies.

Keywords: omphalocele, gastroschisis, birth defects, frequency

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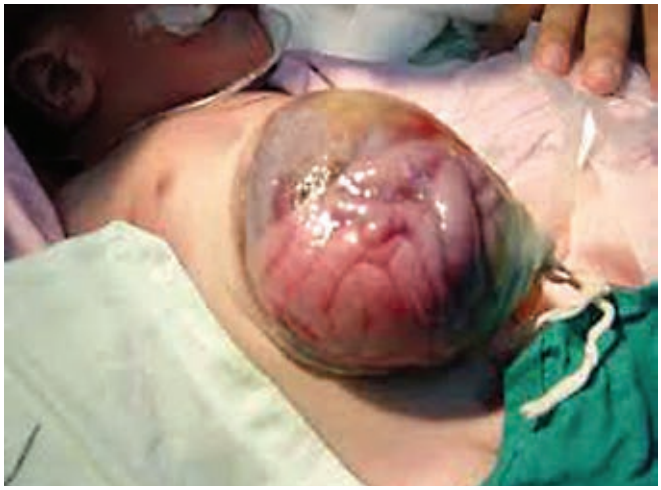
Introduction

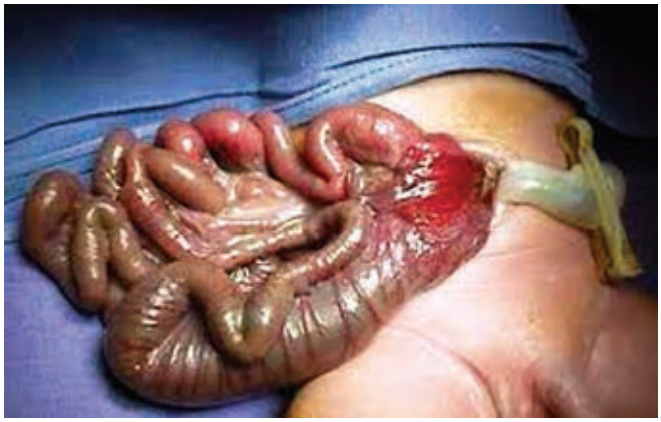
Omphalocele and gastroschisis represent developmental defects of the anterior abdominal wall first described in the 16th century. However, these two conditions have only recently been categorized as separate entities. In 1953 Moore and Strokes[2] defined two separate pathological conditions, and in 1963 Duhamel[3] highlighted their different pathogenesis and clinical manifestations. Omphalocele is a congenital herniation of the abdominal cavity through a central defect in the abdominal wall into amniotic sac layers. (Picture 1.)

Picture 1: Omphalocele (intestines in amniotic sac layers)



In minor defects there is a protrusion of convolutions of the small intestine into the umbilical cord (umbilical cord hernia), while in major defects, the content consists of intestines and other abdominal organs, including the liver and spleen (omphalocele). In gastroschisis, there is a minor defect of the anterior abdominal wall (1-2 cm), usually at the forehand of the umbilical cord insertion. (Picture 2.)

Picture 2: Gastroschisis (herniation of intestine without a hernia sac)



Between umbilicus and the umbilical cord, which is usually of normal structure, there is a bridge of the intact skin. Throughout this defect usually only convolutions of the small intestine eviscerate, so they are found in the amniotic fluid.[4] Nowadays, omphalocele is a more common developmental defect, occurring in 1: 4000 births, compared to 1: 6000 births with gastroschisis.[5,6] Gastroschisis are usually isolated anomalies[7] , while omphalocele is often associated with chromosomal abnormalities and other congenital anomalies.[8] A long-term prognosis in neonates with gastroschisis is significantly better than those with omphalocele, where the survival rate is 50 to 60%, and there are usually chronic medical problems.[9,10]

The aim of this study

To determine the frequency of cases of omphalocele and gastroschisis at the University Hospital Clinical Center Banja Luka in the period from 2000 to 2013. Furthermore, to determine the existence of associated anomalies and finally, to assess the importance of specific etiological factors for the occurence of these anomalies.

Patients and Methods

Having reviewed the medical records of the Clinic for Pediatric Surgery, Pediatric Clinic and Clinic of Gynecology and Obstetrics of the University Hospital Clinical Center of Banja Luka, a retrospective analysis was conducted based on all the cases of congenital defects of the anterior abdominal wall by a type of omphalocele and gastroschisis. Prematurity, associated anomalies, 1-year mortality rate, exposure to environmental factors during pregnancy, maternal diabetes, maternal age and occurrence of these anomalies within a family were taken into account in the analysis of each case. Polyhydramnios, oligohydramnios and complications of prematurity were not monitored as associated anomalies. Cryptorchidism was included in the associated anomalies in babies born at term. Prematurity was defined as a birth before 37 weeks of gestation. Miscarriage was defined as spontaneous abortion within 20 weeks of gestation. The analysis included all cases of gastroschisis and omphalocele (isolated or with associated anomalies), but excluded cases of "prune belly" syndrome and umbilical hernia. Diagnoses of omphalocele and gastroschisis in neonates, together with associated anomalies were confirmed through physical examination by a pediatrician and children's surgeon. In the cases of prenatal diagnosis, abdominal wall defects were discovered during ultrasound examinations during pregnancy. The pathology / autopsy data provide additional information in pregnancies completed with stillbirth, miscarriage or elective termination.

Results

In the period from 2000 to 2013, there were 19 cases of omphalocele, out of which , there were eight cases of live borns. 14 cases were diagnosed prenatally, and in five cases the diagnosis was made after birth. (Table 1.)

Table 1: Cases of omphalocele and gastroschisis at the University Hospital Center Banja Luka in the period 2000-2013.

	Omphalocele group	Gastroschisis group
Prenatal Dg		
Number of births	3	3
Number of stillborns	0	1
Elective pregnancy	5	2
termination	6	3
Miscarriages		
Dg after birth		
Number of births	5	4
Number of stillborns	0	1
Total	19	14
Total number of births	8	7
	Omphalocele group	Gastroschisis group

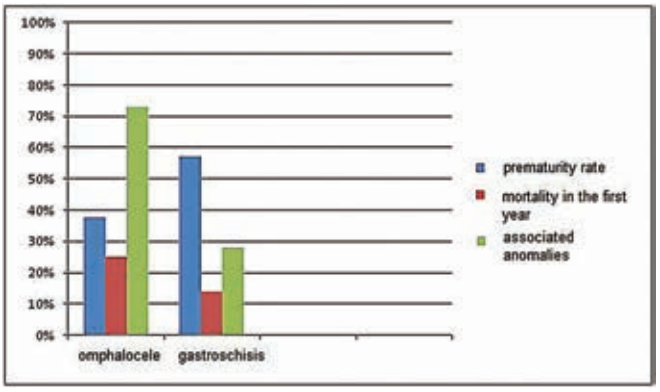
Of the 14 cases of prenatal diagnosis, there were three cases of live borns. Five pregnancies were electively aborted, and the remaining six were miscarriages.In cases of miscarriages, four fetuses showed a lag in intrauterine development and had associated anomalies, and two fetuses had isolated omphalocele.

During the same period, there were 14 cases of gastroschisis, nine were diagnosed in prenatals and five were diagnosed after birth. (Table 1.) .

There were seven births with this defect . In two cases, the child was stillborn. One stillbirth had isolated gastroschisis, and the other had multiple anomalies including hydrops and mutual syndactyly.

In 14 out of 19 cases of omphalocele there were associated anomalies (73%), and the most common among them were congenital heart defects (26%). In contrast, only 4 out of 14 cases of gastroschisis had associated anomalies (28%). (Figure 1.).

Figure 1: Graphical representation of differences in omphalocele and gastroschisis group in relation to the prematurity rate, mortality in the first year aexistence of associated anomalies



Among the eight births with omphalocele, prematurity rate was 3/8 (37.5%); for seven births with gastroschisis prematurity rate was 4/7 (57%). (Figure 3.)

The mortality rate during the first year of life in the group of omphalocele was 2/8 (25%). The cause of death was not directly tied to omphalocele (in one case the cause was respiratory distress and in the second, congenital heart disease). In gastroschisis group, the mortality rate during the first year of life was 1/7 (14%). The cause of death was postoperative complications. (Figure 3.).

In three cases omphalocele was wrongly diagnosed during ultrasonography as gastroschisis, and in one case of gastroschisis, omphalocele was mistakenly diagnosed. In the omphalocele group, 9 out of 19 mothers (47%) reported having used medicines during pregnancy,

whereas in the gastroschisis group medication exposure was 7/14 (50%). In the omphalocele group, 3 mothers (16%) consumed cigarettes during pregnancy compared with 2 mothers (14%) in the gastroschisis group. One case of gestational diabetes was described within the omphalocele group (0.5%), and one case of positive family history in the gastroschisis group (0.7%).

Discussion

In this study, the ratio of omphalocele and gastroschisis was 19/14 or 1.3: 1, compared to the expected ratio of 3: 2 in the world literature. Regargding the births, the ratio was 1: 1, that is, eight cases of omphalocele and seven cases of gastroschisis. Other studies around the world show an increase in the frequency of gastroschisis, and decrese in the appearance of omphalocele.[5,6,7] Rankin and the others[11] reported an increased incidence of gastroschisis without a corresponding change in the appearance of omphalocele. Theories in favor of these changes include the incidence of etiologic agents, incorrect classification, meager family history and a higher risk of occurrence of these defects in families.[12]

In this study, there were no reported cases of stillbirths with exomphalos, although the world literature data show 11-12% of the abovementioned cases .[9] However, excluding elective abortions and pregnancies of unknown outcome, the rate of spontaneous abortions was 31%. It could have been that differences in the criteria for stillbirth in relation to abortion contributed to this discrepancy, and there could have been a bias in reporting. The percentage of associated anomalies was 73% for omphalocele, compared with 28% for gastroschisis. Similar results were published in previous studies,[7,8,12], where congenital heart diseases were most commonly associated with abdominal wall defects.[7]

In this study, prematurity rate amounted to 37.5% for omphalocele and 57% for gastroschisis. Reports of world studies show values ranging from 40% to 60% for gastroschisis, compared to 10% to 23% for omphalocele.[7] Perhaps differences in the criteria for prematurity can be the reasons for the higher rate of preterm birth in the omphalocele group in comparison with other studies.

The mortality rate in the first year of life in the omphalocele group was significantly higher than in the gastroschisis group. The risk for familial occurrence of nonsyndromic defects of the anterior abdominal wall was considered to be low (<1%). However, Torfs and Curry [13]found 3.5% risk of familial occurrence of gastroschisis by expanding pedigree to the second degree relatives. They emphasized that incomplete family history resulted in unreported cases of familial occurrence of these anomalies.[13] Also, incorrect diagnosis, and information in the medical reportscould have affected the actual frequency of occurrence of congenital defects of the anterior abdominal wall within the family. Theories on the method of inheritance ranged from Mendelian monogenic to multifactorial.[8,13]

In this study, mothers in the gastroschisis group were younger than the mothers in the omphalocele group. 37% of mothers younger than 20 were in the gastroschisis group. In the same group there were no mothers older than 40 .Other world studies show similar results: the incidence of gastroschisis is the highest among the mothers under 20 years of age and sharply decreases with increasing age of the mother.[14,15] Less than 7% of mothers in the groups were older than 29 years. The reason for younger age of the mothers is unknown.[15]

For unknown reasons, stillborn children with omphalocele were not represented in this study. Also, graphical representations of the studies are susceptible to bias in the interpretation of data, but this bias is limited by physical examination of newborns by the same doctor, as well as analysis of sonographic findings and histopathologic reports.

Conclusion

33 patients with omphalocele and gastroschisis, treated in this study, confirm the reports of medical facilities in the world that the incidence of gastroschisis increases in comparison to omphalocele [5,6,14] and gastroschisis may be more common than isolated omphalocele with births. Although there is no clear reason for the change in trend of occurrence of these anomalies, statistical data from these studies should have an effect on textbooks in which omphalocele are still considered to be more common anomalies.

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Omfalocele i gastroshize: 14-godišnja studija

SAŽETAK

Uvod: Omfalocele i gastroshize su razvojni defekti prednjeg trbušnog zida, koji su tek nedavno kategorisani kao zasebni entiteti. U oba slučaja se radi o hernijaciji organa trbušne duplje kroz odgovarajuće defekte prednjeg trbušnog zida. Smatra se da su omfalocele dosta češće razvojne anomalije i često su udružene sa drugim razvojnim poremećajima, za razliku od gastroshiza koje se obično javljaju izolovano.

Cilj rada: Odrediti učestalost slučajeva omfalocela i gastroshiza u Kliničkom centru Banja Luka u periodu od 2000.-2013. godine.

Pacijenti i metode: Uvidom u medicinsku dokumentaciju učinjena je retrospektivna analiza svih slučajeva urođenih defekata prednjeg trbušnog zida u Kliničkom centru Banja Luka, u periodu od 2000.-2013. godine. Analizom su obuhvaćeni svi slučajevi omfalocela i gastroshiza, a u obzir je uziman prematuritet, pridružene anomalije, stopa mortaliteta u prvoj godini, izloženost faktorima okoline tokom trudnoće, dijabetes majke, starosna dob majke, kao i familijarna pojava ovih anomalija. Slučajevi „prune belly" sindroma i umbilikalnih hernija nisu obuhvaćeni ovim ispitivanjem.

Rezultati: U periodu od 2000.-2013. bilo je ukupno 19 slučajeva omfalocele, od toga osmoro živorođene djece. U istom periodu bilo je ukupno 14 slučajeva gastroshize, a živorođene djece sa ovim defektom bilo je sedam. U 73% slučajeva omfalocele, postojale su udružene anomalije, dok je taj procenat kod gastroshiza bio znatno manji i iznosio je 28%. Među živorođenom djecom stopa prematuriteta iznosila je 37.5% za grupu omfalocele, a za grupu gastroshiza 57%. Stopa mortaliteta u prvoj godini života iznosila je 25% za omfalocele i 14% za gastroshize. I u jednim i u drugim slučajevima uzrok smrti nije bio vezan direktno za abdominalni defekt, već za prateće komplikacije (respiratorni distres na prvom mjestu). Polovina majki iz obe grupe izjavila je da je tokom trudnoće koristila neke lijekove ili konzumirala cigarete. Opisan je i jedan slučaj gestacijskog dijabetesa u grupi omfalocele i jedan slučaj pozitivne porodične anamneze iz grupe gastroshize.

Diskusija: U ovoj studiji odnos omfalocela i gastroshiza bio je19/14 ili 1.3:1, u odnosu na očekivani odnos 3:2 u svjetskim literaturama. I druge studije širom svijeta pokazuju povećanje učestalosti gastroshiza i pad incidence omfalocela. Nismo imali prijavljenih slučajeva mrtvorođene djece sa omfalocelom iako u svjetskoj literaturi postoje podaci od 11-12%. Razlog ove neusklađenosti mogu biti različiti kriterijumi za mrtvorođenost u odnosu na pobačaj, a možda postoji i pristrasnost u izvještavanju. Procenat udruženih anomalija je veći kad su u pitanju omfalocele, a slični rezultati objavljeni su i u drugim studijama. Stopa smrtnosti u prvoj godini života je u grupi omfalocele znatno veća u odnosu na grupu gastroshiza. Iz nepoznatih razloga mrtvorođena djeca sa omfalocelom nisu zastupljena u ovoj studiji.

Zaključak: 33 pacijenta sa omfalocelom i gastroshizom, obrađena u ovoj studiji, potvrđuju medicinske izvještaje u svijetu koji ukazuju da se incidenca gastroshiza povećava u odnosu na omfalocelu, i ti statistički podaci bi trebalo dase odraze i na udžbenike u kojima se omfalocele i dalje predstavljaju kao značajno češće anomalije.

Ključne riječi: omfalocela, gastroshiza, urođene mane, učestalost

PROFESSIONAL PAPER

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Quality of Life of Schizophrenic Patients with or without Depot Neuroleptics

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ABSTRACT

Introduction: Schizophrenia is a chronic mental illness that negatively affects the quality of life of the patient and his family. Primary therapy in the treatment of schizophrenia is antipsychotics.

Aims of the study: The aim of this study was to compare the quality of life of schizophrenic patients treated with depot neuroleptics preparations and patients without depot neuroleptics.

Patientes and Methods: The sample size included 64 patients aged 18-65 years divided into two groups: patients treated with depot neuroleptic preparations and the control group, patients not treated with depot neuroleptics. For the investigation we used history and socio-demographic data, body weight, blood pressure, as well as quality of life questionnaire [a combination of Lancashire and Mansa questionnaire) and short scale for psychiatric evaluation (BPRS)

Results: The average age of the examinees was 44.19 ± 7.785 years (experimental group: 43.31 ± 6.879 and control 45.06 ± 8.617 years). Regarding the frequent changes in mood, there were no statistically significant differences between the groups, Hi = 0000, p <0.05. A statistically significant difference between the groups was found in the presence of hallucinations (c2 = 8.400, df = 3, p = 0.038),

Conclusion: It was found that the quality of life of patients treated for schizophrenia does not significantly differ, regardless of whether depot preparations are used or not; this finding is in accordance with the reports made by other authors.

Keywords: schizophrenia, quality of life, neuroleptics, depot preparations

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Introduction

Schizophrenia is a chronic mental illness with a prevalence of about one percent. [1]

Schizophrenia occurs earlier in males than in females [2,3] Most frequently it occurs in males between l5 and 24 years, while in females between 25 and 34 years. [4,5] For the development of schizophrenia, biological factors, social factors and factors of individual life experience are of great importance. [6,7] The primary symptoms of schizophrenia fall into disorders of the association of thought, affect disorder, ambivalence and autism (four A syndrome, by

Bleuler) . [8,9] Schizophrenia is characterized by an altered opinion in form and content. [10-15]

Primary therapy in the treatment of schizophrenia represents pharmacotherapy, with antipsychotics playing a significant role. [16, 17]

The World Health Organization (WHO) , under the quality of life, implies the perception of individuals on their position in life, in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns about their environment. [18-20] Research on the quality of life of mentally ill people appeared at the beginning of the nineties, followed by a plethora of studies on quality of life of patients with somatic symptoms. [21-23] There is no doubt that the assessment of the quality of life of psychiatric patients is in relation to the objective social factors, physical health, emotional, family and cultural factors. [24,25]

Aim of the study

The aim of this study is to compare the quality of life of schizophrenic patients treated with depot neuroleptics and without depot neuroleptics.

Patients and Methods

The study included patients treated in the period from December, 2011 to September, 2012, at the Center for Mental Health, PHI "Health Center" Gradiska. The investigation was conducted in compliance with the Declaration of Helsinki on medical research and the principles of good scientific practice. Initially, 67 patients were selected for the study, but only 64 were further included in the study, aged 18-60 years, out of which 36 were female subjects (56.3%) and 28 male (43.7%). Patients whose intellectual abilities were at the level of light mental retardation were excluded from the study.

Experimental group consisted of patients suffering from schizophrenia, treated with depot neuroleptics and with or without additional oral therapy (n = 32). The control group consisted of patients suffering from schizophrenia and receiving oral therapy exclusively (n = 32). Informed consent was obtained from all study subjects. Based on medical history, socio-demographic data, and medical records assessment, we obtained data on the age, marital and employment status, level of education and the presence of somatic diseases in patients. Determination of body weight was done using calibrated scales and recorded values were expressed in kg; body height was determined using stadiometer and recorded values were expressed in cm. Quality of Life Questionnaire and BPRS were filled by the examiners after examinees provided their answers to the questions.

Statistical analysis was performed using SPSS (Statistical Package for the Social Sciences), version 20, as the analytical statistical tool.

Data were analyzed using descriptive statistics. χ^2-test of independence was used to determine the relationship between two categorical variables.

Results

The results of data analysis showed that the average age of the examinees was 44.19 ± 7.785 (experimental group: 43.31 ± 6.879 and control: 45.06 ± 8.617 years). Age of the examinees in both groups is shown in **Table 1.**

Table 1. Age of examinees

Examinees group	N	Min.	Max.	Range	Median	Mean	Std. Dev.	CV (%)
Experimental group	32	28	52	24	46.00	43.31	6.879	15.88
Control group	32	28	60	32	48.00	45.06	8.617	19.12
Total	64	28	60	32	46.00	44.19	7.785	17.62

N= number of subjects Min= age of the youngest subject Max= age of the oldest subject Range=, average age of the subject Median= mediana, Mean= arithmetic mean Std. Dev.= Standard deviation CV (%) = coefficient of variation.

Using a Man-Whitney U test of rank to analyze the data on arterial pressure, no significant difference was found in systolic arterial pressure values between the experimental (Md = 122.50, n = 32) and control (Md = 122.50, n = 32) group, U = 440 000, z = -0977, p = 0328, r = 0.12, as well as in diastolic arterial pressure between the experimental (Md = 82.50, n = 32) and control (Md = 87.50, n = 32) group, U = 487 000, z = -0341, p = 0.733, r = 0.04. Results showing the level of satisfaction in quality of life: housing, friends, visits to cultural events and religiosity are presented in **Table 2.**

Using the Chi-square test of independence for analysis, data showed that there were no statistically significant differences in both groups compared to inflammatory therapy ($\chi 2$ = 1570, SS = 2, p = 0.456), as well as the presence of frequent mood changes (χ^2 = 0077, SS = 1, p = 0.781); while the examination of hallucinations showed statistically significant difference between two groups (χ^2 = 8.400, df = 3, p = 0.038). Neuroleptics in relation to the number of patients are presented in **Table 3.**

Table 2. χ^2 **- test and the level of statistically significant differences in housing, satisfaction with friends, visits to cultural events and religiosity between the experimental and control group.**

Characteristic		Experimental group		Control group		Total		c2 values	S	NSZ
		f	%	f	%	f	%			
Lives	At home	28	87.5	26	81.2	54	84.4	2.074	2	0.355
	In the apartment	3	9.4	2	6.2	5	7.8			
	Subtenant	1	3.1	4	12.5	5	7.8			
Satisfactions with friends	Very good	2	6.2	4	12.5	6	9.4	0.772	4	0.942
	Good	18	56.2	17	53.1	35	54.7			
	Moderate	7	21.9	6	18.8	13	20.3			
	Poor	2	6.2	2	6.2	4	6.2			
	Very poor	3	9.4	3	9.4	6	9.4			
Visits to cultural manifestations.	Often	1	3.1	0	0.0	1	1.6	4.857	2	0.088
	Sometimes	1	3.1	6	18.8	7	10.9			
	Never	30	93.8	26	81.2	56	87.5			
Religiosity	Yes	24	75.0	25	78.1	49	76.6	0.000	1	1.000
	No	8	25.0	7	21.9	15	23.4			

f = number of patients in the experimental group, the control group and the total number of patients, SS = b, degree of freedom, NSZ = level of statistical significance (p)

Table 3. Neuroleptics in relation to the namber of patients

Neuroleptics	depot forms	tablets
	number of patients	number of patients
Flufenazin	27	4
Haloperidol	6	5
Risperidon	3	12
Klozapin	-	15
Prasine	-	9

The presence of disorientation was not found in the study groups.

Discussion

Measures of the quality of life of schizophrenic patients are used for different purposes. In the first place it serves the purpose to assess the performance of methods of treatment, so called application of new medications, including the widely conceived programs for the prevention of mental disorders.[21-27]

Research studies of Salokangas et al. showed that the quality of life of schizophrenic patients in Finland was higher in those subjects who lived in good marital or partnership relationships.[28,29] The quality of life of schizophrenic patients was also examined by Holzinger et al., with participation of 605 psychiatrists in Germany, where it was shown that the highest ranked aspect of quality of life was the patient's satisfaction, i.e. social interaction, contacts and the acceptance by the people in their immediate family environment, followed by lack of symptoms and the ability to work.[30] However, the study including schizophrenic patients in Nigeria showed that their quality of life was more dependent on marital status and employment, meaning that married and employed were more satisfied with the quality of life.[31, 32] Similarly, the studies on schizophrenic patients from different cultural backgrounds, such as China, showed higher scores of quality of life achieved by employed persons living in families who were religious, and older examinees with higher incomes, but the differences were not significant.[33-34] In contrast, our research did not show significant disparities in the quality of life of schizophrenic patients, in accordance with research conducted by Kuga A. et al. in Japan, who showed that none of the socio-demographic or objective variables affected the assessment of the quality of life of schizophrenic patients. [35]

Regarding the treatment of schizophrenic patients, haloperidol decanoate may have a significant effect on improvement of the symptoms and behaviors in comparison to placebo, but the data to confirm this theory are extremely rare.[36-40] There are no visible differences between haloperidol administered in depot form or orally. For those who need this medicine and who wish to use it, the method on which the medicine enters the body is a matter of personal choice and clinical assessment. [41-45] Since there are clear differences between haloperidol decanoate

and other depots, the choice of depot medication could also be a matter of personal judgment and the patient's attitude about the form that is more suitable for use. [46-49] Fluphenazine decanoate does not reduce relapse more than orally administered neuroleptics or other depot antipsychotics. [50-54] The research showed that there was small advantage of depot-forms compared to the same medicine taken orally, in terms of compatibility. However, this is not broadly applicable in everyday clinical practice.[55] Following two groups of schizophrenic patients after discharge from a psychiatric hospital during period of one year , where one group was administered oral therapy and the other a depot formulation, it was found that patients on oral therapy had higher rates of re-hospitalization and their quality of life was not better than in patients on depot medication.[56] These findings were partially in agreement with our study results that showed no difference in the quality of life of schizophrenic patients on depot preparation and those taking oral agents.

Conclusion

On the basis of the conducted research we can conclude that the results of our study are in agreement with the results of other studies. The quality of life of schizophrenic patients treated with or without depot preparations was mainly the same, with small deviations. There were no statistically significant differences between two groups based on gender, age structure, education, employment, body weight, and body height. A statistically significant difference was determined in the presence of hallucinations, which were more frequent in patients treated with depot preparations neuroleptics, in comparison to subjects without depot in therapy. Disorientation was not present in either group of examinees. These results may contribute to the treatment and improvement of quality of life of the patients suffering from this disease.

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Kvalitet života shizofrenih pacijenata sa i bez depo preparata neuroleptika

SAŽETAK

Uvod: Shizofrenija je hronično mentalno oboljenje koje negativno utiče na kvalitet života, pacijenta i njegove porodice. Osnovnu terapiju u liječenju shizofrenije predstavljaju antipsihotici.

Cilj istraživanja:
Cilj istraživanja je bio da se uporedi kvalitet života shizofrenih pacijenata koji se liječe depo preparatima neuroleptika i pacijenata bez depo preparata neuroleptika.

Ispitanici i metode: Uzorak čine 64 pacijenta uzrasta od 18 do 65 godina koji su podijeljeni u dvije grupe: grupu pacijenata liječenjih depo preparatima neuroleptika i kontrolnu grupu bez depo preparata neuroleptika. U istraživanju su korišteni anamnestički i sociodemografski podaci, tjelesna težina, arterijski krvni pritisak te upitnik o kvaliteti života (kombinacija Lankaširskog i Mansa upitnika) i kratka skala za psihijatrijsku procjenu (BPRS).

Rezultati: Prosječna starost svih ispitanika je bila 44.19±7.785 godina (ekperimentanla grupa: 43.31±6.879 i kontrolna: 45.06±8.617 godine). Nije bilo statistički značajne razlike između ispitivanih grupa o prisustvu čestog neraspoloženja Hi =0000, p>0.05. Utvrđena je statistički značajna razlika između ispitivanih grupa u postojanju halucinacija (c2 = 8.400, SS = 3, p = 0.038).

Zaključak: Utvrđeno je da nema bitnije razlike u kvaliteti života pacijenata koji se liječe od shizofrenije, bez obzira da li se koriste depo preparati ili ne, što je u saglasnosti sa rezultatima drugih autora.

Ključne riječi: shizofrenija, kvalitet života, neuroleptici, depo preparati

REVIEW ARTICLE

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Low-pressure and Gasless Laparascopy in Abdominal Surgery

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ABSTRACT

Knowledge of pathophysiological basis of laparoscopic procedures, that is, the influence of CO2 pneumoperitoneum (PNP) on the body in particular, can prevent the complications during laparoscopy to occur. Standard intra-abdominal pressure (IAP), which is used during laparoscopic surgery, is 12-15 mm / Hg. The direct effect of CO2 pneumoperitoneum is a result of mechanical action of the gas and increasement of intra-abdominal pressure (IAP). The indirect effect of CO2 pneumoperitoneum is caused by the absorption of gas inserted into the abdomen. Analysis of published articles that assess the effects of CO2 pneumoperitoneum on the body and abdominal organs contributes to a better usage of the laparoscopic method. Different techniques in laparoscopy, created as an alternative to standard CO2-pneumoperitoneum, have the task to reduce the risks for patients with comorbidity and simultaneously raise the abdominal wall and allow the surgeon to perform smooth operation, which is especially important for ASA III and ASA IV patients. Alternative techniques can be divided into three groups: laparoscopy using pneumoperitoneum with low intra-abdominal pressure (up to 8 mm / Hg), laparoscopy using retractors abdominal wall and limited pneumoperitoneum, and laparoscopy without the use of gas (gasless laparoscopy; raising the abdominal wall retractor only). Low insufflation pressure in the abdomen (up to 8 mm / Hg) is beneficial for patients with laparoscopic procedures and its routine usage in elderly patients and patients with severe cardiorespiratory diseases, should be common practice. Gasless laparoscopy was created because of the need to prevent the negative effects of increased intra-abdominal pressure on the body during laparoscopy, primarily in patients with high comorbidity (ASA III and ASA IV). When compared to other techniques, numerous studies prefer laparoscopy with low insufflation pressure, but in practice this is not done routinely, yet each technique is applied selectively, according to the needs and condition of the patient, which is the most appropriate. To avoid the side effects of CO2 pneumoperitoneum, which is important in high-risk patients, it is more likely to operate on low IAP (6-8 mm / Hg) or use gasless laparoscopy. This is especially important for long – duration operations.

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Introduction

Controlled insufflation pressure within the abdominal cavity has the task to enable the smooth operation to the surgeon, lifting the front abdominal wall up and pushing other abdominal organs and soft tissues back. CO2 gas is considered to be the most approprite for insufflation into the abdominal cavity, as it fulfills several important criteria: it is non-flammable and it is possible to use electrocauter. Moreover, it is very soluble in blood and tissues, and may be easily ejected through the lungs, it is nontoxic and very inexpensive (Table 1.). Other gases such as argon, helium and NO2, have been used experimentally and have not closely met the above requirements,and are therefore rarely used.[1,2]

Table 1. Characteristics of an ideal gas insufflation that meets $CO2_{1,2}$

The properties of an ideal gas insufflation
• colorless
• antiknock
• fireproof
• limited feature resorption
• limited physiological effects on the body after absorption
• rapidly excreted from the body after absorption
• does not support the occurrence of burns
• limited physiological effects in the case of intravascular embolization
• highly soluble in blood

It is a known fact that greater intra-abdominal pressure during laparoscopic procedures provides better and improved exposure of the operating field and allows the surgeon to perform easier operation. It is also known that the insufflation gas in the body cavity above certain value leads to a change in the body, such as disorders of homeostasis, disorders of respiratory function of the lung, and the resulting disturbance of blood gas values and the occurrence of acidosis.[1] Furthermore, increased intrabadominalni pressure may cause the transient disturbances of liver[1,2] function, kidney[1,2,3] and a series of hemodynamic changes in organism.[1] Momentary pathophysiological changes that occur in the body during laparoscopy with standard insufflation pressure are shown in Table 2.

Table 2. The pathophysiological effects of increased intra-abdominal pressure on organism[1]

Effects of increased intra-abdominal pressure on the body
• Cardiovascular and hemodynamic disorders
• Respiratory disorders
• Decreased blood flow through splanchnic blood vessels, liver and kidneys
• Increase venous stasis in the lower extremities
• Increased intracranial pressure

In patients with severe cardiorespiratory disease, patients with tumors, traumatized patients and patients with already impaired renal function and liver, there is a high risk in the application of standard methods with standard laparoscopy with intra-abdominal pressure of 14 mm / Hg due to the possible emergence of numerous complications, [1,4-8,14] Overview of basic possible complications caused by CO_2 pneumopreitoneum pressure laparoscopy in abdominal surgery can be seen in Table 3.

Table 3. Transient disturbances caused by increased IAP during laparoscopy in abdominal surgery.

TYPE STANDARD disorders caused by PNP (12-15 mm / Hg)
Cardiovascular and hemodynamic disorders
• Decreased venous flow to the heart
• Increased consumption of O2 level
• infarction
• The reduction of cardiac output
• The increase in systemic vascular resistance
• The increase in vascular resistance in the lung
Respiratory disorders
• The increase in Pa CO2
• Decreased arterial pH (acidosis)
• Decreased functional residual capacity
• Increase anatomic dead space
• PaO2 unchanged
Hypoperfusion abdominal organs
• Hepatoporalni effects
o the transient hypoperfusion hepatocytes
o the increase in aminotransferases
o the reduced flow through the portal vein and a, hepatik
• Splanchnic effects
o Reduced airflow through the stomach and other organs
• Renal effects
o reduction of renal blood flow
o the lower glomerular filtration rate
• Increased venous thrombosis in the lower extremities and abdomen
Increased intracranial pressure

Due to all the abovementioned, a way to make an adequate exploration of abdominal laparoscopic procedure and to avoid the possible complications and adverse effects of pneumoperitoneum on the whole organism and intra-abdominal organs was required. It was necessary to reduce or eliminate the negative effects of insufflated gas in the stomach in order to avoid possible complications listed. Hence, the alternative techniques in laparoscopy, which can reduce the negative effects of CO2 pneumoperitoneum, reduce risks for patients and istoveremeno raise the abdominal wall and allow the surgeon to perform smooth operation, were created.

Alternative techniques can be divided into three groups:

- Laparoscopy using pneumoperitoneum intraabdominal low pressure (up to 8 mm / Hg); [1,3,7,8]
- Laparoscopy using retractors of abdominal wall and limited pneumoperitoneum (up to 5 mm / Hg);[9]

• Laparoscopy without the use of gas (gasless laparoscopy; raising the abdominal wall retractor only). [10,11]

These techniques represent a good alternative for the application of laparoscopy in cases where there are high risks for the use of a standard pneumoperitoneum with the values of pressure in the abdomen from 12-14 mm / Hg. Randomized prospective clinical studies have shown that the gasless laparoscopy with limited insufflation using retractors, where there are almost no negative effects of pneumoperitoneum on organizam is the most economical.[9-15]

Laparoscopy with low pressure intrabadominalnim

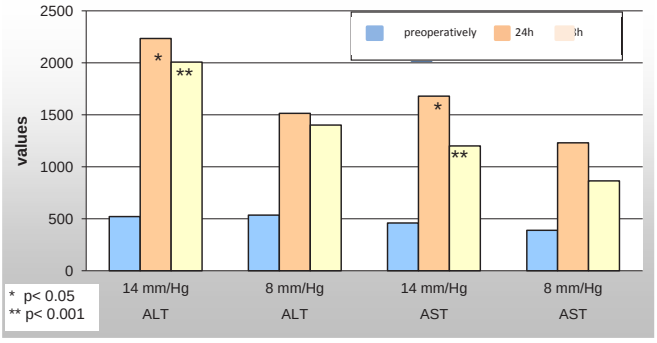
In cases when it comes to difficult patients with impaired cardiorespiratory reserve, laparoscopic surgery can be done at the IAP of 8 mm / Hg. Since laparoscopic cholecystectomy is considered to be the gold standard in chronic calculus cholecystitis, this procedure can be done by applying low pressure pneumoperitoneum, and in patients with heart comorbidity. Of course, it is necessary to raise the insufflation pressure in the abdomen to 15 mm / Hg at first, in the process of establishing pneumoperitoneum, and setting the primary and secondary trocar,. Taking into consideration that it takes a very short time, this initial high IAP usually does not have major consequences for the patients.[7,9-14,15]

There are many benefits of insufflation pressure not exceeding 8 mm / Hg. At this pressure , there are no disorders in the body caused by pneumoperitoneum of 14 mm / Hg. Changes in liver function, kidney function and respiratory changes are almost non-existent in patients done by low pressure, especially when it comes to short-term laparoscopic surgical procedures and when it comes to ASA I or ASA II patients.[7,8,15] What may represent less difficulty in dealing with this low pressure is the fact that the free space of the abdominal cavity is decreased, which can make it more difficult for the surgeon during the laparoscopic surgery. If it is a case of less experienced surgeon or complex laparoscopic surgery, sometimes it is not possible to perform the surgery at this pressure in abdomen. In that case, it is advisible to apply some of the alternative techniques, gasless laparoscopy or open, conventional method.

It has also been established that laparoscopy with low pressure in the abdomen causes less postoperative pain, and less frequent pain in the right shoulder and avoids the side effects of increased insufflation pressure on the liver. Also, when it comes to an experienced surgeon, the safety of operation with low insufflation pressure is no less than when working with standard pneumoperitoneum. There is no evidence of differences in the number of complications, mortality and frequency conversion between working with low and high insufflation pressure. It has also been proved that the method of laparoscopic cholecystectomy in low insufflation pressure (8 mm / Hg) does not lead to reduced blood flow through the liver and other abdominal organs which occurs in standard pneumoperitoneum of 14 mm / Hg.[7,8-13,17]

Distribution of mean values of alanine aminotransferase (ALT) and aspartate aminotransferase (AST) during laparoscopic cholecystectomy in insufflation pressure of 8 and 14 mm / Hg is shown in Chart 1.[7]

Chart 1. Distribution of mean values of ALT and AST during laparoscopic cholecystectomy in insufflation pressure of 8 and 14 mm / Hg (Hasukić, 2005)



Low insufflation pressure in the abdomen during laparoscopy is beneficial for the patients with laparoscopic procedures and its routine use in elderly patients or patients with severe cardiorespiratory diseases should be common practice. Routine usage of low insufflation pressure in patients with severe hemodynamic and cardiorespiratory disorders are recommended by many surgeons.[2,3,8,13-15-17] Regardless the numerous studies that favor laparoscopy with low insufflation pressure, most surgeons do not perform it routinely, but selectively, according to the needs and condition of the patient, which is probably the most appropriate. Cooperation between surgeons and anesthesiologists in terms of determining the modes and values of intra-abdominal pressure during laparoscopy is very important.

Laparoscopy using retractors and limited pneumoperitoneum

Simultaneous use of retractors (erector) of the abdominal wall and limited pneumoperitoneum to IAP values of 3-4 mm / Hg is a very favorable technique that does not have some influence on the organism as a standard pneumoperitoneum as the limited insufflation gas allows the surgeon to perform the operation more easily. The first techniques of the usage of retractors of abdominal wall implied partial insufflation of the abdominal cavity in order to achieve better overview.[18] The list and

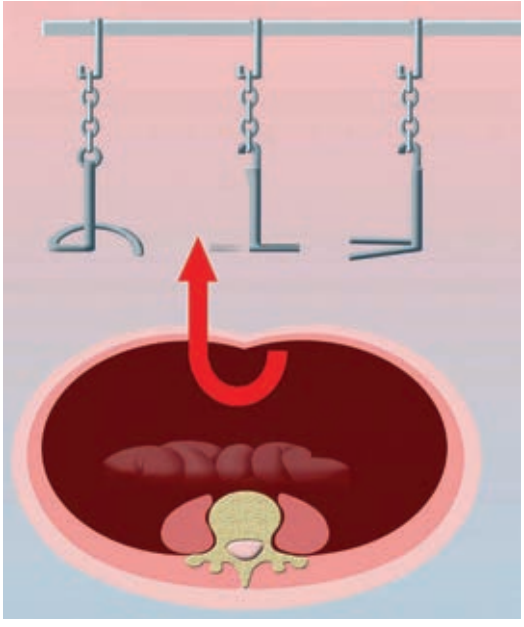
history of these instruments are presented in Table 4.

Table 4. History of different types of retractors abdominal wall that require limited and insufflation gas

Types of retractors the abdominal wall that require limited and insufflation gas
• SEMM 1991 - ACE WISAP- T-shape
• GAZIERLY 1991 MODEL-1-T-shape
• KITANO 1992.- U form- additional exposure
• BANTING 1993- Loop form - raising leagues. falciform
• ARAKI 1993- KIRSCHNER wire
• DRAGOJEVIĆ 1994- spreading trocar
• SCHALLER 1994- PCA- compression of viscera

T-shape erector of abdominal wall is designed to be inserted into the abdomen through a trocar with a slight lifting of the anterior abdominal wall, after which the abdomen inflates gas of up to 8 mm / Hg.[19] U-shaped retractor is designed to require limited insufflation gas during its setting (up to 4 mm / Hg). After installation, there is no need for gas because it is possible to achieve exposure of the operative field with the reactor only.[9,10,18,19] Elevation of leagues falciform is performed with specially made polyethylene bent trocar. Various modifications of the retractors were made with the aim of raising the abdominal wall by lifting leagues falciform. This method is applied along with the pneumoperitoneum low pressure.[9,18,19] Scheme of different types of retractors abdominal wall that require limited and insufflation gas can be seen in Figure 1.

Figure 1. Different types of retractors of abdominal wall which demand a limited gas insufflation



Gasless laparoscopy

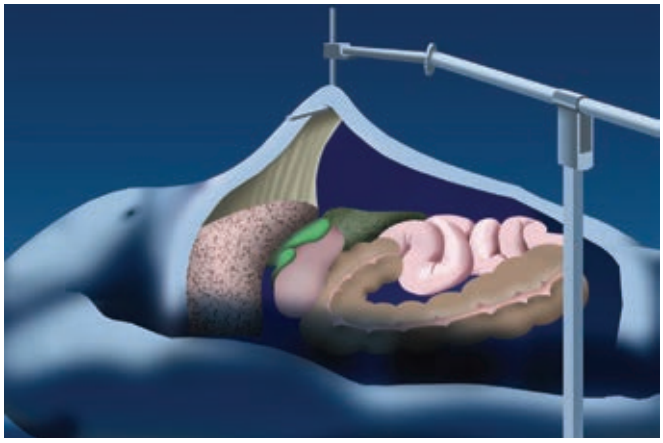
Elevation of the abdominal wall without using any gas and with the help of special retractors is defined as gasless laparoscopy.[18,20,21] This method was first applied by Nagai in 1991 during laparoscopic holicistectomy.[20] Types of retractors of the abdominal wall that does not require pneumoperitoneum are displayed in Table 5.

Table 5. Types of retractors the anterior abdominal wall that does not require pneumoperitoneum

Types of retractors the anterior abdominal wall that does not require pneumoperitoneum
• Naga 1991 - subcutaneously placed needle
• HASHIMOTO 1993- double wire
• CHIN and MOLL 1993- “laparolift” system
• Conventional retractors

In the method promoted by Nagai, it is a common practice to use Kirscner’s wires that are placed subcutaneously in the appropriate places of anterior abdominal wall. The wires are attached to a special L retractor which is attached to the operating table.[20] Modification of this method of raising the anterior abdominal wall was done by Hashimoto in 1993 who used two 30 cm-long Kirscner’s wires attached again to the special retractor that was attached to the operating table.[21] Chin and Moll were the first to announce and introduce the usage of the technique of flat-raising abdominal wall.[22] Original system is standardized, produced and is available under the name LAPAROLIFT. Conventional retractors of different manufacturers are also in use during gasless laparoscopy and they require special minor incision upon the setting up the. They may occur in different shapes. Schematic outline of gasless laparoscopy is displayed in Figure 2.

Figure 2. Scheme gasless laparoscopy with the help of LAPAROLIFT



The technique of setting LAPAROLIFT system in gasless laparoscopy
• Reinforce the retractor to the side of the operating table before cleaning the operative field.
• Standard preoperatively cleaning of the abdomen, and before covering the same, it is necessary to enfold the retractor in transparent plastic bag.
• The standard approach for almost all intra-abdominal laparoscopic procedures is periumbilical area.
• Make a small incision in the abdomen to set the retractor to lift the abdominal wall.
• They should be different forms of reactors available retractors: array, ring, etc.
• After entering the abdomen, open the retractor.
• Anchor the retractor set in the belly to the LAPAROLIFT. Activate the Laparolift to the values that are equivalent to an intraabdominal pressure of 15 mm / Hg.
• Set a laparoscope into the abdomen through an periumbical incision

Instruments are set through a trocar or small incision (2 cm). When it comes to this technique, laparoscopic instruments or all the longer instruments for open surgery can be used. Cleaning the operative field is possible with traditional instruments for suction and irrigation without the possibility of loss of pressure at the CO2 pneumoperitoneum.

Potential advantages and disadvantages og gasless laparoscopy in comparision to standard laparoscopy using CO2 with IAP of 14 mm / Hg are shown in Table 6.

Table 6. Advantages and Disadvantages of gasless laparoscopy compared to standard laparoscopy with CO2 using the IAP of 14 mm / Hg

Advantages and disadvantages of gasless laparoscopy
Benefits
• Prevents complications by CO2 pneumoperitoneum in the body
• Reduces possibility for gas embolization
• No need to prevent a gas leak in the operating area
• Opens a possibility to use conventional instruments
• Secure laparoscopic methods in high-risk patients
Disadvantages
• Availability and display the operating fields are inferior to CO2 pneumoperitoneum
• Post-operative pain is greater than that of CO2 pneumoperitoneum

Gasless laparoscopy was created because of the need to prevent the negative effects of increased intra-abdominal pressure on the body during laparoscopy, primarily in patients with comorbidity (ASA III and ASA IV). Gasless laparoscopy does not lead to significant hemodynamic changes in the body,[23,24,] there are no reports on reduced kidney nor liver function,[25,26] the body's response to stress is lower, as well as post-operative pain and sickness.[23,26,27] Despite these advantages, the main reason for many surgeons to put this technique in 1st place is work and adequate visualization of intra-abdominal area which often result in higher number of conversions in these methods. Although gasless laparoscopy has many advantages over the classical technique of laparoscopy with insufflation gas, its application requires an experienced and skilled surgeon, it is limited in the usage in certain small groups of patients (ASA III and ASA IV) and hence, this technique is not frequently used in practice.[24-27]

Conclusion

Direct and indirect effects of CO2 pneumoperitoneum on the body during laparoscopy in abdominal surgery in high risk patients may cause certain complications or lead to the inability of laparoscopic techniques. In these cases, it is possible to use a laparoscopic technique with low IAP, which is slightly more technically demanding for the surgeon, but could be the method of choice for the patient. Laparoscopic techniques that apply lifters (ecarters) of an abdominal wall or as they are also called gasless techniques, have not become a coompn practic nor have they implemented in our country and in the world. The reason lies in the fact that the gasless techniques are often longer in performance, complicated for the surgeon, expensive and require additional equipment. Also, the operative field is not as comfortable as shown in the case of CO2 pneumoperitoneum. Many surgeons find low IAP to be the most favorable technique of laparoscopy in patients with comorbidity and ASA III-V ASA status. Low insufflation pressure in the abdomen (up to 8 mm / Hg) is beneficial for patients with laparoscopic procedures and its routine usage in elderly patients or patients with severe cardiorespiratory diseases, should be a common practice.

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Laparoskopija sa niskim intrabadominalnim pritiskom i bezplinska laparoskopija u abdominalnoj hirurgiji

SAŽETAK

Poznavanjem patofiziološke osnove laparoskopskih procedura, naročito utjecaja CO_2 pneumoperitoneuma (PNP) na organizam, može se spriječiti nastanak komplikacija tokom laparoskopije. Standardni intraabdominalni pritisak (IAP), koji se koristi tokom laparoskopske hirurgije, iznosi 12-15 mm/Hg. Direktni efekat CO_2 pneumoperitoneuma je posljedica mehaničkog djelovanja samog plina i povećanja intraabdominalnog pritiska(IAP). Indirektni efekat CO_2 pneumoperitoneuma uzrokovan je absorpcijom gasa ubačenog u trbuh. Analiza objavljenih članaka koji procjenjuju efekte CO_2 pneumoperitoneuma na organizam i intraabdominalne organe doprinosi još kvalitetnijoj primjeni laparoskopske metode. Različite tehnike rada u laparoskopiji, nastale kao alternativa standardnom CO_2-pneumoperitoneumu, imaju zadatak smanjiti rizike za pacijenta sa komorbiditetom a

istovremeno podići trbušni zid i omogućiti hirurgu nesmetan rad, što je posebno važno za ASA III i ASA IV pacijente. Alternativne tehnike rada mogu se podijeliti u tri grupe: laparoskopija uz upotrebu pneumoperitoneuma sa niskim intraabdominalnim pritiskom (do 8 mm/Hg), laparoskopija uz upotrebu retraktora trbušnog zida i ograničenog pneumoperitoneuma, i laparoskopija bez upotrebe plina (bezplinska laparoskopija; podizanje trbušnog zida samo retraktorom). Nizak insuflacioni pritisak u trbuhu (do 8 mm/Hg) pogoduje pacijentima kod laparoskopskih procedura i njegova rutinska primjena kod starijih pacijenata ili pacijenata sa teškim kardiorespiratornim bolestima, trebala bi biti uobičajena praksa. Bezplinska laparoskopija je nastala zbog potrebe prevencije negativnih efekata povećanog intraabdominalnog pritiska na organizam tokom laparoskopije, prvenstveno kod pacijenata sa visokim komorbiditetom (ASA III i ASA IV). Mnogobrojne studije daju prednost laparoskopiji sa niskim insuflacionim pritiskom u odnosu na ostale tehnike rada, ali u praksi to se ne radi rutinski, nego se svaka tehnika primjenjuje selektivno, prema potrebama i stanju pacijenta, što je i najispravnije. Da bi se izbjegli neželjeni efekti CO_2 pneumoperitoneuma, što je važno kod rizičnih pacijenata, potrebno je češće operisati sa niskim IAP (6-8 mm/Hg) ili koristiti bezplinsku laparoskopiju. Ovo je posebno značajno kod operativnih zahvata koji vremenski duže traju.

CASE REPORT

UDK 616.37-006.04-089

Inferior Pancreaticoduodenal Artery Aneurysm Associated with Obstruction of the Celiac Trunk and Cancer of the Head of the Pancreas

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ABSTRACT

Aneurysm of the visceral arteries is a rare condition and it represents around 1% of all arterial aneurisms. Aneurysm of the inferior pancreaticoduodenal artery represents around 2% of all visceral aneurysms. Aneurysm associated with occlusion of the coeliac trunk is very rare condition and there are only about 40 cases presented in the literature. In our study, we presented 56 year-old female admitted to hospital with obstructive jaundice. CT scan diagnosed tumor of the head of pancreas and CT angiography confirmed aneurysm of the inferior pancreaticoduodenal artery which was successfully operated at our clinic.

Keywords: pancreaticoduodenal artery aneurysm, cancer of the head of pancreas, obstruction of celiac trunk

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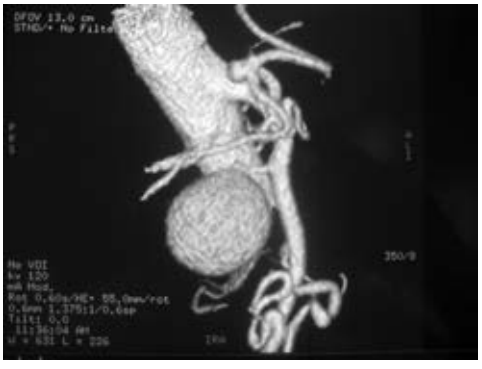
Case report

A 56 year-old female with obstructive jaundice was admitted at our clinic. US and CT scan confirmed the tumor of the head of pancreas and CT angiography diagnosed aneurysm of the inferior pancreaticoduodenal artery with obstruction of celiac artery. (Figure 1.).

Figure 1. CT angiography aneurysm of the inferior pancreaticoduodenal artery

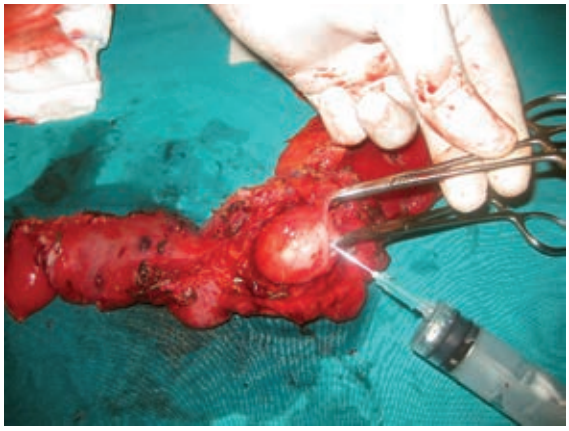


Painless jaundice was the cause of doctor's appointment and aneurysm of the pancreaticoduodenal artery was discovered accidentally, as it was asymptomatic.

With the usage of upper median laparotomy, we opened the abdominal cavity, removed tumor together with the head of the pancreas, duodenum and gastric antrum. By careful preparation we showed aneurysms of the artery pancreaticoduodenal, which was ligated and resected at the origin of the upper mesenteric artery (Figure 2.). Upon the resection, we tested a sufficiency of the collateral circulation (Figure 2.). As surgery lasted for about 5 hours and there were no signs of ischemia of the liver, spleen and stomach stump, there was no need for revascularization of the celiac trunk.

Biliodigestive reconstruction and reconstruction of the digestive tract was performed according to standard Whipple method. The postoperative course was satisfactory. Subsequent histological analysis confirmed adenocarcinoma of the pancreatic head.

Figure 2. Aneurysms of the artery pancreaticoduodenal



Discussion

Aneurysms of visceral arteries are very rare but life-threatening states. They present only about 1-2% of all aneurysms, and pancreaticoduodenal artery is a very rare place for the aneurysm occurrence. Only about 40 cases of aneurysms of the pancreaticoduodenal arteries associated with thrombosis or occlusion of the celiac trunk has been reported in the literature.[1] That state is not considered to be particularly coincidental, because by the occlusion of the main celiac, a liver, spleen and stomach are vascularized through the upper mesenteric artery across the pancreaticoduodenal arcade. Chronically hypertension leads to weakness of the arterial wall, and causes dilation and aneurysm formation. Aneurysm can be associated with the development of abundant collateral circulation.[2,3] The aneurysm itself is asymptomatic at first, then with nonspecific abdominal symptoms, and may lead to rupture and potentially life-threatening intra-abdominal hemorrhage. Less asymptomatic aneurysm incidentally detected by CT examination. Some patients may have signs of mesenteric ischemia due to stenosis or associated extraluminal compression of mesenteric artery. Rupture of an aneurysm in the retropertoneal space is a severe condition that is manifested by severe abdominal pain, and may be developed and hypovolemic shock if the rupture at the free abdominal cavity. Extremely rare is rupture of the digestive tract (stomach, duodenum, small and large intestine). The incidence of rupture is not directly proportional to the size of the aneurysm and it is difficult to predict the potential risk of rupture. Therefore, it is necessary to treat all types of diagnosed aneurisms.[2,3]

When conventional selective angiography or CT angiography diagnoses visceral artery aneurysms, it is necessery to preform a dynamic evaluation of collateral blood flow and diagnose the possible obstruction of the main splanhnich artery. CT angiography isa more recent and very successful non-invasive method to achieve an accurate diagnosis. Two-and three-dimensional video clearly shows the localization of the aneurysm and possible visceral artery stenosis. Endovascular stenting of the occluded visceral arteries and transcatheter embolization of aneurysms are the best option treatment for diagnosing the asymptomatic aneurysms. Transcateter embolization is the method of interventional radiology which can have complications (aneurysm rupture, intestinal ischemia, etc.). Surgical treatment involves ligation and resection,and, when possible, a reconstruction. Some authors advocate re-vascularization of the celiac trunk in the case of poorly developed collateral circulation.[4,5]

Conclusions

Aneurysms of the pancreaticoduodenal artery with obstruction of coeliac truk are very rare conditions. Correlation with pancreatic carcinoma is coincidental, and surgical treatment is the method of choice due to the basic disease. Radicality of oncological procedure is a specified option and surgical resection of aneurysm is the treatment of choice. It is not necessery to perform reconstruction of pancreaticoduodenal artery because of the conducted and extensive surgical procedure for the malignant disease (cephalic duodenopancreatectomy). Furthermore, due to the well-developed collateral circulation, it is usually not necessary to open the main tree celiac trunk, and the cephalic duodenopancreatectomy itself is used to amputate the irrigation area of pancreaticoduodenal arcades.

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Aneurizma donje pankreatikoduodenalne arterije udružena sa opstrukcijom celijačnog stabla i karcinomom glave pankreasa

APSTRAKT

Sažetak: Aneurizme visceralnih arterija su rijetka stanja i čine oko 1% svih arterijskih aneurizmi. Aneurizma pankreatikoduodenalne arterije čini svega oko 2% svih visceralnih aneurizmi. Aneurizma pankreatikoduodenalne arterije povezana s okluzijom celijačnog stabla je vrlo rijetko stanje i samo oko 40-tak slučajeva do sada je opisano u literaturi. Predstavili smo 56 godina staru ženu primljenu u bolnicu zbog opstruktivne žutice, CT-a dijagnostikovanog tumora glave gušterače i CT angiografski dokazane aneurizme donje pankreatikoduodenalne arterije koja je uspješno operisana u našoj klinici.

Ključne riječi: aneurizma pankreatikoduodenalne arterije, karcinom glave gušterače, opstrukcija celijačnog stabla

CASE REPORT

UDK 618.11-006.6-08

Giant Mucinous Ovarian Cystadenocarcinoma

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ABSTRACT

Mucinous cystadenosarcoma make 10% of ovarian cancers. They are among the largest ovarian tumors measuring up to 50cm in diameter. We want to show a case of a female patient aged 69 years, who was brought to surgery due to the large abdominal mass, abdominal growth noticed four months earlier, with prior weight loss. After CT examination of the abdomen, we found extremely distended abdominal cavity, filled with coarse grained content, with apparent suspicion of tumor of the abdomen of ovarian origin. During the surgery, the following operations were performed: extirpation of the cyst sized 80x80x80cm, right adnexectomy, partial resection of the uterus, the reconstruction of the right ureter with the previous placement of double J-stent, and the reconstruction of the anterior abdominal wall. The postoperative course was uneventful. Pathohisthological diagnosis confirmed cystadenocarcinoma mucinosum invasive partim inflammatum ovary, G1, pT1a. The tumor morphologically corresponded to multicystic, well-differentiated invasive mucinous adenocarcinoma with parts that have the characteristics of mucinous tumor with the border degree of malignancy. Since the diagnostic and therapeutic procedures did not elucidate the origin of the tumor mass, and gynecological-oncological principles were not respected in terms of radicalism, the patient was proposed a new surgical procedure that would imply a total hysterectomy and left adnexectomy, which was refused by the patient. Medical check-up after 12 months did not confirm disease recurrence.

Key words: ovarian cystadenocarcinoma, mucynous, giant

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Introduction

Ovarian cancer, as the disease of highly developed socio-economical societies, is the sixth disease according to the incidence, in comparison to other malignancies in female population, with around 205.000 new cases per year. According to the incidence in the field of gynecologic oncology, it is the second malignancy, and it is the second in the world when speaking about mortality rate with absolute number of 125.000 deaths per year.[1] Mucinous cystadenocarcinoma makes 10 % of ovarian cancers. They belong to the largest ovarian tumors with dimensions up to 50 cm in diameter. One quarter of these tumors has a bilateral localisation.[2]

In a typical history of ovarian cancer the following symptoms can be found: abdominal pain (53%), increase of the abdominal volume (46%), difficult and frequent urination (39%), feeling of satiety (22%), vaginal bleeding (14%), obstipation (17%), and weight loss despite the increased and distended abdomen.[3]

Taylor et al reported that around 10% of all cases of ovarian carcinoma are genetically predisposed.[4] Namely, positive family history in terms of breast cancer and ovarian cancer, especially in younger age, may indicate the presence of BRCA1 (chromosome 17) and BRCA2 (chromosome 13) of genetic mutation in patients from such families.[4] This type of

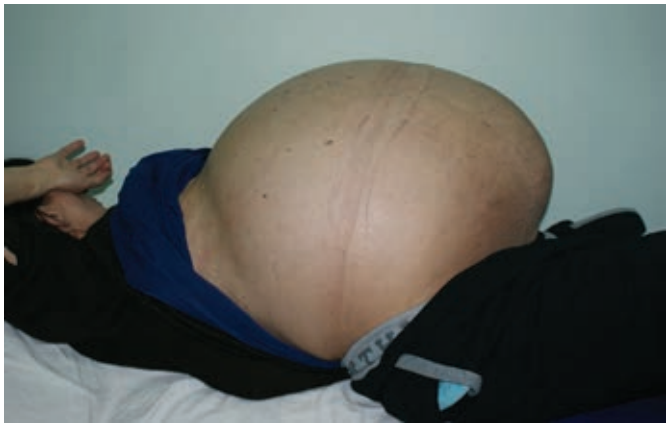
carcinoma is detected earlier than the more frequent serous type of ovarian epithelial carcinoma, thus leading to a better perspective. However, females with advanced mucinous ovarian tumor have much worse perspective in comparison to those with advanced serous ovarian tumor. Scientists believe that the possible explanation lays in the fact that the mucinous ovarian carcinoma is biologically different than the serous, and that it is more similar to carcinoma of gastrointestinal tract, such as the colorectal cancer. [5]

Case report

A 69-year-old female was reported to the surgical clinic with the huge abdominal mass in November, 2013. She noticed the sudden stomach growth within the previous four months, with previous weight loss and the loss of appetite. She stated earlier problems with diverticula - related diseases and hiatal hernia in the stomach. She did not give birth. Menopause occurred at the age of 53. She denied the usage of tobacco and alcohol.

After physical examination, it was found that the patient was hemodynamically and respiratory stable, with medium osteomuscular material, pale skin, afebrile T=36,5 Celsius degree; blood pressure 170/100 mmHg; pulse of 100 beats per minute; with normal findings on the respiratory and cardio-vascular system. The abdomen was enormously enlarged to volume of the 70 cm, above the chest level, tight skin with prominent subcutaneous venous drawings, painless to palpation (Figure 1.). The patient was stagnant due to the large abdominal mass.

Figure 1. Pre-surgical examination: enormously enlarged stomach of the patient.



Laboratory findings showed hypokalemia, hyperazotemia (K 3,7 mmol/l, Urea 10.30 mmol/l). X-Ray showed enormous soft tissue mass on the subdiaphragmathic abdomen and the lower part of thorax, which significantly suppressed the diaphragm and the heart shadow. The CT of the abdomen was done, and it showed the extremely distended abdominal cavity, replete with coarse grained content, most probably thick gelatin which was monitored directly under the liver and spleen caudal to the bowl, lifting the front abdominal wall. Transversal diameter of the above-stated formation was over 50 cm. In continuity with the left adnexa cranially, above the entrance into the upper pelvic area, resting on to the bowl wall posteriorly repressed column, there was inhomogeneous mixed density which could have corresponded to the left ovary. However, an intimate contact with the descendent column included voluminous, imbibed mesocolon. The above-mentioned formation had a transversal diameter of 7 cm. Almost identical formation which was present at the right rib arch, was present on the wall of the compressed and repressed column. Taking into consideration the above-stated, we decided to perform exploratory laparotomy. Intraoperatively, the large cystic tumor sized 80 x 80 x 80 cm was found, and then opened forehand. (Figure 2.)

Figure 2. Stuffed massive cyst in the abdomen

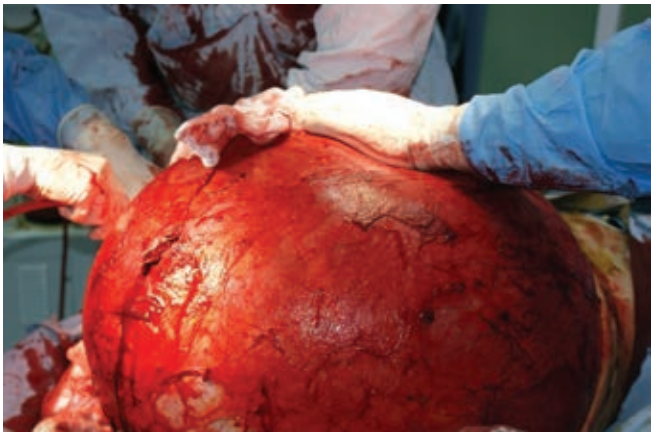
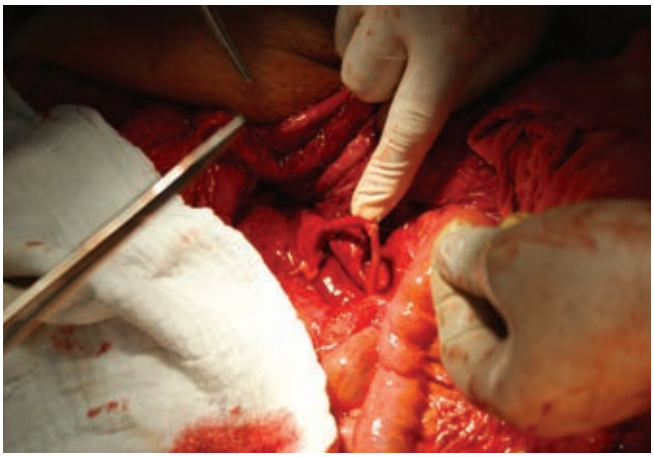


Figure 3. Ureter reconstruction

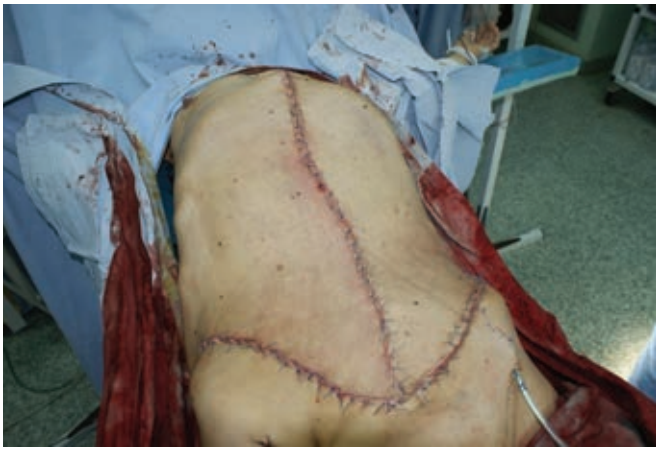


The cyst contained large amount of brownish turbid liquid. The wall of this cyst contained two necrotic formations – one was men's fist sized, and the other tangerine-sized. Cyst adhered to the lateral wall of uterus and the right adnexa gave the impression that the above-stated mass was of

ovarian origins. On the liver macroscopically and palpatory there were no secondary deposits. Cyst extirpation was performed, together with the right adnexectomy, partial uterus resection, omentectomy, and due to the iatrogenic lesion the ureter suture with the preceding, stent placement was performed (Figure 3.).

The surgery was completed with the plastic and front stomach wall reconstruction (Figure 4.).

Figure 4. Appearance and the reconstruction of abdominal cavity after the massive cyst extirpation from the stomach cavity



Pathohystological diagnosis cyctadenocarcinoma mucinosum invasivum ovary, G1, pT1a. By its morphological structure, tumor corresponded to the multicystic, well-differentiated invasive mucinous adenocarcinoma with parts that had the characteristics of mucinous tumor of borderline malignity degree. The patient spent early post-surgery period at the Intensive care unit, due to the intensive hemodynamic, respiratory and renal monitoring. Taking into consideration the fact that diagnostical and therapeutical procedures did not elucidate the origins of the tumor mass, as well as the fact that the gynecological and oncological principles were not respected in the sense of radicalness, the patient was suggested to visit the gynecologist who proposed the continuation of adjuvant chemotherapy and another surgery which implied total hysterectomy and the left adnexectomy, which was rejected by the patient. Proposed chemotherapy was also rejected by the patient. Post-surgery monitoring during the period of 12 months (CT of abdomen, tumor markers, KKS, SE, UZ of abdomen) showed that there were no signs of the advanced disease.

Discussion

Ovarian cancers are considered to be the largest problem in the field of gynecologic oncology. The main reason lays in the fact that the early diagnosis is impossible, thus, the only option is to make the diagnosis in the advanced stadium of this disease. The early detection of this disease requires a reliable screening test. Nowadays three screening techniques are available: pelvic examination, CA-125 level and the vaginal ultra-sound which mainly does not establish the ovarian cancer but do suggest its presence. [6]

Ovarian cysts are considered large if they are 10 and 20 cm in diameter, [7] and in cases when they cross these dimensions, they are considered gygantic cysts. Gygantic cystadenocarcinoma are rare clinical states. The largest removed ovarian tumor that was recorded in literature had a weight of 137,4 kg and it was removed in the form of intact mass by O'Hanlan. [8] Also, ovarian adenocarcinom with the weight of 64 kg was described by Pool et al. and it was removed from an obese female.[9] Mattioda de Lima et al. published their removal of cystadenocarcinom of weight 40 kg from a 57-year-old Brazilian female.[10] In a 52-year-old female in the post-menopause period, a solid bilateral ovarian mass was diagnosed and removed with the size of right 25 x 30 cm, and left 15 x 12 cm, with weight 6.5 kg. Pathohystologically ovarian adenocarcinoma was confirmed by Satpathy. [11]

Regardless the pathohystological diagnosis, gygantic cysts require surgery treatment because of the compressive symptoms, malignant alteration risks and the preventions of the cyst burst, thus shedding the cyst liquid into the stomach cavity.[12] Females with the tumor mass in their stomach cavities are a huge challenge in a daily practice, above all due to the silent and unspecific clinical signs of tumor. Accompanying signs of obesity are aggravating factor.

Although the growth of tumor markers CEA, CA 19-9, CA-125, alphafeto-proteins can be very useful in the differential diagnosis of malignant cystic tumors, they can also be increased in benign tumors. Cevik et al. published the removal of a large mucinous cystadenoma of the left ovary with dimensions of 40 x 30 x 20 cm with the higher value of tumor marker from a 13-year-old girl. [13]

Survival rate with the ovarian cancers is 30%, and this rate has not significantly changed within the last 30 years.[14] The data show a significant connection between the disease stage, diagnosis and the five-year survival. Rate of patients diagnosed in the stadium I, when the tumor is localized on to the ovary, varies between 22 and 28%, with the survival rate between 72 and 81%. Survival rate for most of the patients in the stadiums II to IV is significantly worse. [15]

Literature shows that patients with the optimal tumor reduction, despite the advanced stage of disease, have middle survival rate with 39 months of survival, in comparison to 17 months of survival of patients with sub-optimal surgeries.[16] However, retrospective analysis results of 349 patients with post-surgery residual mass smaller or equal to 1 cm suggest that patients with advanced disease stage with tumor reduction have a worse outcome than the patients with the early disease stage.[17] Standard post-surgery therapy implies chemotherapy with cisplatin/paclitaxel or substitution of paclitaxel with cyclophosphamide for the advanced stages of the disease.[18]

Taking into consideration the fact that diagnostical and therapeutical procedures did not elucidate the origins of the tumor mass, as well as the fact that the gynecological and oncological principles were not respected in the sense of radicalness, the patient was suggested another surgery which implied total hysterectomy and left adnexectomy, which was rejected by the patient. Proposed chemotherapy was also rejected by the patient. Despite this, one year after the surgical treatment there were no signs of disease recurrence.

Conclusion

Diagnosis of the ovarian cancer in its early stage is very difficult. In fact, at the moment of diagnosis, most of them are ate the advanced stage. Pathohistological diagnosis, disease stage, aggressive surgical treatment are, when possible, part of initial evaluation and the ovarian cancer treatment. Although in this concrete case the diagnosis was late, cystadenocarcinoma was still removed before dissemination.

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Gigantski mucinozni cistoadenokarcinom jajnika

SAŽETAK

Mucinozni cistadenokarcinomi čine 10% ovarijalnih karcinoma. Oni spadaju u najveće ovarijalne tumore dimenzija i do 50 cm u prečniku. Želimo pokazati slučaj žene stare 69 godina koja se javila u hirušku ambulantu prvenstveno zbog velike abdominalne mase, rasta trbuha primijećenog unazad četiri mjeseca, uz prethodni gubitak tjelesne težine. CT pregledom abdomena utvrdili smo ekstremno distendiranu abdominalnu šupljinu, ispunjenu grubo zrnatim sadržajem, sa očiglednom sumnjom na tumor abdomena ovarijalnog porijekla. Tokom operativnog zahvata izvedena je ekstirpacija ciste dimenzija 80x80x80 cm, desna adneksektomija, parcijalna resekcija uterusa, rekonstrukcija desnog uretera sa prethodnim plasiranjem double J stenta te rekonstrukcija prednjeg trbušnog zida. Postoperativni tok bio je uredan. Patohistološka dijagnoza potvrdila je cyctadenocarcinoma mucinosum invasivum partim inflammatum ovary, G1, pT1a. Tumor je morfologijom odgovarao multicističnom, dobro diferenciranom invasivnom mucinoznom adenokarcinomu sa dijelovima karakteristika mucinoznog tumora graničnog stepena maligniteta. Obzirom da dijagnostički i terapeutski postupci nisu rasvijetlili porijeklo tumorske mase te da ginekološki onkološki principi nisu ispoštovani u smislu radikalnosti, pacijentici je predložen novi operativni zahvat koji bi podrazumijevao totalnu histerektomiju i lijevu adneksektomiju, ali je pacijentica odbila. Kontrola pacijentice nakon 12 mjeseci nije potvrdila recidiv bolesti.

Ključne riječi: mucinozni cistadenokarcinom, ovarijum

CASE REPORT

UDK 616.15-005-053.31

Immune Hydrops Fetalis

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ABSTRACT

Hydrops fetalis is a serious condition indicating a bad prognosis of affected fetuses. Incidence of immune hydropsfetalis is significantly decreasing, whereas more and more non-immune hydropsfetalisis are identified. We described a case of the most difficult manifestation of hemolytic disease of a newborn due to rhesus incompatibility. Immune hydrops fetalis occurred due to inadequate immune prophylaxis. While treating the newborn, we applied exchange transfusion, additional transfusion and immunoglobulin therapy. With sensitized pregnant patients, it is necessary to regularly monitor the condition of fetus and titer of mother's antibodies. Considering a difficulty of affected fetuses' disease, it is necessary to strengthen preventive measures by application of rhesus immunoglobulin with affected Rh negative mothers.

Key words: hydrops fetalis, RhD alloimmunization, exchange transfusion

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Introduction

Hydrops fetalis is the excessive accumulation of fluid in two or more fetal tissues, which results in gross edema, occurrence of ascites, pleural and pericardial effusions. This serious clinical condition could lead to fetal death and significant neonatal mortality. In etiology, it has been divided into immune [1] and non-immune hydrops fetalis,[2] it occurs in 1:3000 live borns. Tendency of decreasing immune hydrops fetalis incidence is present, and it occurs in 10-20% cases. The most often cause is hemolytic disease of fetus/neonates (HDFN) defined by Rh(D) alloimmunization.[3] IgG anti-D antibodies in blood are created with Rh(D) negative pregnant patient and, afterwards, these transfer to circulation of Rh(D) positive fetus, they are absorbed to D positive erythrocytes and destruct them. Process can be so mild that child does not acquire any therapy, but at the same time, it can be so difficult that severe fetal anemia occurs in 20-25% cases of sick fetuses. Anemia is becoming more serious in spite of extramedullary erythropoiesis, gross edema develops, hypoproteinemia, amount of body water increases, which accumulates in extra cellular tissues region and serous cavities[4] and circulating anti-erythrocyte antibodies could be identified. Newborn with immune hydrops fetalis has clinical features of a difficult patient with anasarca, ascites, serious cardio-pulmonic distress, heart insufficiency, perinatal asphyxia, anemia, hyperbilirubinemia, hypoalbuminemia, difficult water-electrolyte disorder, hemorrhagic syndrome, hypotension and acute renal insufficiency.[5]The treatment is complex; a significant number of newborns are pre-term children requiring respiratory support. There are several guidelines for treating hyperbilirubinemia, intensified photo therapy, exchange transfusion (EST). [6] Exchange transfusion is used for removing bilirubin and antibodies (IgG anti – D), hypoxia is corrected, numerous metabolic disorders are regulated. There are different techniques of performing the EST. The most often is a common volumetric one with exchange of two blood volumes of Rh negative appropriate blood type. There is less number of newborns which acquire EST, and the process itself is related to significant morbidity and mortality.[7] Recently, immunoglobulins are used in the therapy of immune hydrops fetalis and they are administered right after the birth, and hence significantly decrease the risk of developing severe hyperbilirubinemia and need for the EST and additional transfusions .[8]

Course and outcome of Rh(D) alloimmunizated pregnancies is uncertain although prophylaxis, possibilities for

antenatal therapy, intrauterine intravascular transfusion[9] and postnatal therapy, EST and additional transfusions are applied. Due to this, the most effective preventive measure is administration of rhesus immunoglobulin to Rh negative women after giving birth, with the risk of RhD sensitization. In our circumstances, Rh(D) alloimmunization is still very rare.

Case Report

A male newborn was admitted to the Medical Intensive Care Unit of the Clinic of Pediatric Surgery ,University Hospital Clinical Centre Banja Luka after being taken care of, due to hydrops fetalis, in the delivery room of the Clinic of Gynecology and Obstetrics.

The newborn was the fifth child out of fifth pregnancy of a 30-year-old mother. Pregnancy was supervised due to Rh alloimmunization. Mother's blood type was B, RhD negative. The four older children had type B, RhD positive and were healthy children. Mother was administered rhesus immunoglobulin after the 1st , 3rd and 4th pregnancy, but not after the 2nd one. In the fourth pregnancy, sensitization occurred just about the due date, the newborn developed hyperbilirubinemia, which required application of photo therapy. During this pregnancy, titer increase was registered in direct Coombs test (1:8), ultrasound confirmed the presence of fetal ascites and generalized skin edema. It was a preterm birth, conducted in 35+4 gestation week by urgent Caesarean section. Newborn was 2,820 g, AS 4/6, reanimated after birth. Newborn requested endotracheal intubation and application of mechanical ventilation due to respiratory distress. At the first examination, gross skin edema was present and abdomen was excessively distended due to ascites. Child's blood type was O, RhD positive, direct antiglobulin test (Coombs test) positive, swing +++, IgG +++, c_3d negative. Blood results showed hemoglobin 99 g/L, erythrocytes $2.32x10^9$/L, reticulocytes 3%, leukocytes $10.76x10^{12}$/L, platelet cells $128x10^9$/L, total bilirubin 210.1 μmol/L, direct bilirubin 15.1 μmol/L, total proteins 41.7 g/dL, albumins 26 g/dL.

Due to anemia and hyperbilirubinemia, double volume exchange transfusion with fresh blood type O, Rh negative was performed at the 7th hour of life. During blood exchange, a cardiac arrest occurred, reanimation was performed with administration of Adrenalin, and cardio respiratory instability was maintained. In the first hours of child's life, high values of bilirubin were registered so intensive continuous photo therapy was applied, which was stopped on the 3rd day of the child's life due to increase in direct bilirubin. The child was administered with immunoglobulin infusion (1 g/kg). Anemia therapy requested erythrocytes transfusion for three times. Apart from correction of hypoalbuminemia, it was necessary to perform correction of water-electrolyte, acid-base and metabolic disorders. Complications were thrombocytopenia $64x10^9$/L and infection followed by increase of inflammatory parameters, but Acinetobacter was isolated from tracheal aspirate only. Additionally, disease course was complicated by interventricular bleeding, second degree, on both sides, as well as Papileu, which was in a gradual regression. Newborn gave favorable feedback to the applied therapy procedures. The child was discharged on the 24thday of his life. At the control examination, at 2.5 months of life, it had moderate hyper tonus and anemia was maintained aside from correction by ferric preparations.

Discussion

Hydrops fetalis is an urgent medical state requesting fast ultrasound assessment of the fetus at the referent hospital, early identification of possible causes and treatment strategy. Mortality rate of newborn with hydrops fetalis is high - about50-95% (2). Bad prognosis is followed by smaller gestational age of the newborn, lower Apgar score, severe acidosis and presence of pericardial effusions. [10]

Improvement of survival and favorable outcome is within application of early prenatal intervention –most often intrauterine intravascular transfusion is applied. [11] There are numerous causes of hydrops fetalis. Lin and associates, in their recently published paper, studied reasons of hydrops fetalisin 156 cases and determined non-immune anemia in 35.9% cases, cardiac anomaly in 9.6% cases, intrauterine infection in7.1% cases, twins issues in 6.4% cases, meconium peritonitis in 5.8% cases, thorax disease – lungs in5.1% cases, chromosome anomalies in4.5% casesandimmune anemia in1.9%cases. [12]

Prevalence of immune hydrops was decreased due to Rh(D) alloimmunization, but alloimmunization was present due to existence of other antigens related to Rh factor, and some of them led to strong anemia and hydrops fetalis.[13]Because of this, it was necessary to perform screening of mother's antibodies for all possible combinations related toRh factor.

Immune hydrops fetalis is the most difficult form of hemolytic disease of fetus/neonate and it represents a serious medical and social issue. Considering the fact that sensitization of Rh(D) incompatible transfusion is very rare nowadays, the modern clinical practice sees Rh(D) incompatible pregnancy as the biggest problem. Etiology of Rh(D) alloimmunization origin with pregnant women having previous births or previous abortions is mostly due to failure of administration of immune globulin Rh(D)in postpartal period. Women with already created anti-D antibody become pregnant again. [14]Rh(D) alloimmunization could also occur as a consequence of invisible transfer of fetal Rh positive erythrocyte in mother's circulation in an amount big enough to cause immunization. The problem of Rh(D) alloimmunization has been described and discussed a lot around the world. There are countries with developed

health protection where sensitization is not existent any more.[15]In developing countries, immune hydrops fetalis rate is still high. Amin and associates published that occurrence of immune hydrops is 18.42%, and Rh incompatibility is found as cause in 85.7% cases. [16] In the Republic of Srpska, similar to other Balkan countries, alloimmunization is still present and it represents one of significant issues of prenatal control.

It is necessary to run the therapy of basic situation leading to hydrops fetalis, as well as entire symptomatic therapy. Repeated exchange transfusions are more often with preterm neonates than full-term neonates. Numerous complications in performance of the EST are described: from technical problems to occurrence of apnea, cardio-respiratory distress, and rare lethal outcome. [17] Our patient suffered cardiac arrest in performance of the EST with fast reaction to reanimation. After the EST, mild metabolic acidosis was present, as described in study by Patra and associates. [18]

Prevention and therapy of immune hydrops fetalis demands continuous supervision in antenatal, intrapartal, postpartal and neonatal period. The aim of antenatal supervision with Rh(D) alloimmunizated pregnant women is precise diagnosis of blood type incompatibility and sensitization, timely start of therapy procedures and choice of optima birth date. [16]

Besides prevention, both here and in the world, eradication of HBFN was not performed due to existence of other antigens related to Rh factor. [19] It is necessary to create programs for application of Rh(D) immune globulin at the national level, to define possible immune conditions within, during pregnancy and after giving a birth, due to defining appropriate amount of hyper immune anti-D immune globulin. Optimal way of protection includes application of rhesus immune globulin in three doses: first – three months before birth, second – during birth and third – 72 hours after birth. [20] The usage of rhesus immune globulin with risky Rh negative mothers has reduced alloimmunization throughout the world.

Conclusion

We presented a case of immune hydrops fetalis resulted from inadequate immune prophylaxis, which provided conditions for Rh alloimmunization. Course of newborn's disease with immune hydrops fetalis is extremely complicated. Invasive procedures and numerous symptomatic therapies are necessary for treatment. Therefore, prevention is the first, the most important and the most efficient step in therapy.

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Imuni Hidrops Fetalis

SAŽETAK

Hidrops fetalis je ozbiljno stanje koje upućuje na lošu prognozu kod pogođenih fetusa. Incidenca imunog fetalnog hidropsa se značajno smanjuje, dok se sve češće opisuje neimuni fetalni hidrops. Opisali smo slučaj najteže manifestacije hemolitičke bolesti novorođenčeta zbog rhesus inkompatibilije, imuni fetalni hidrops nastao zbog neadekvantne imuno profilakse. U liječenju novorođenčeta primenjena je eksangvinotransfuzija, dodatna transfuzija i terapija sa imunoglobulinima. Kod senzibilisanih trudnica potrebno je učestalo pratiti stanje fetusa i titar majčinih antitela. S obzirom na težinu oboljenja pogođenih fetusa potrebno je pojačati preventivne mjere primjenom rhesus imuno globulina kod pogođenih Rh negativnih majki.

Ključne reči: hidrops fetalis, RhD aloimunizacija, eksangvinotransfuzija

BOOK REVIEW UDK 616.15-005-053.31(048.83)

Clinical anatomy

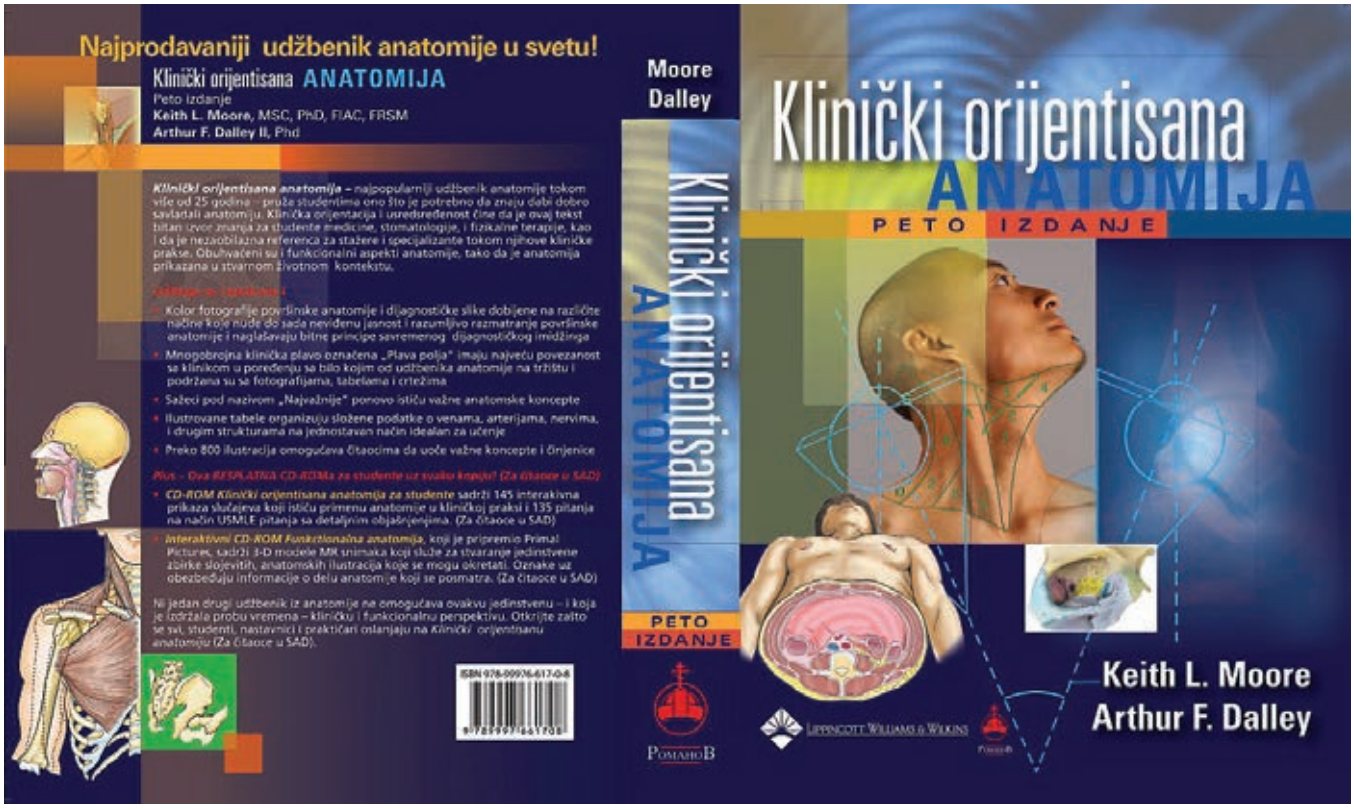
by K. Moore and A. Dalley

It is with enormous pleasure that we can make an announcement to widest medical circles that the newest translation of *Clinical anatomy* by K. Moore and A. Dalley has seen the daylight, as part of a continuous effort of two publishers from Belgrade (Serbia) and Banja Luka (Bosnia and Herzegovina), the Romanov and the Bard-Fin respectively, to bring benchmark texts from the field closer to the readership, since they have also published *Grant's anatomical atlas*. Clinical anatomy is a classic textbook dealing with human anatomy, if classic here stands not only for quality and long life (this is the translation of the fifth edition), but also its topicality and approaches to presenting the subject matter. When the latter is concerned, this textbook epitomizes contemporary expertise from the field, since its every section contains, apart from data from descriptive and topographic anatomy, highlighted areas featuring practical ideas (blue box) and information on imaging methods (green box). Such a design makes it possible for making strong connections between the very subject matter and the practical needs. Consequently, it facilitates the learning process in all its aspects.

Although as many as 32 scholars from numerous medical schools in the region of former Yugoslavia took part in the translation process, neither the coherence of the text, nor each individual signature, is compromised. The book contains 1,209 pages and over 800 remarkable illustrations in full colour, accompanied by thorough notes, its volume and reach satisfying the needs of medical students with respect to the subject of anatomy as part of medical school curricula. In addition, it is indispensable as a compendium to physicians already working in hospitals and clinics, even interns.

This textbook , translated by a large number of university professors of anatomy, offers a long-term solution for a credible source of knowledge in the field of human anatomy.

Chief reviewer:
Prof. Slobodan Malobabic,
Faculty of Medicine, University of Belgrade

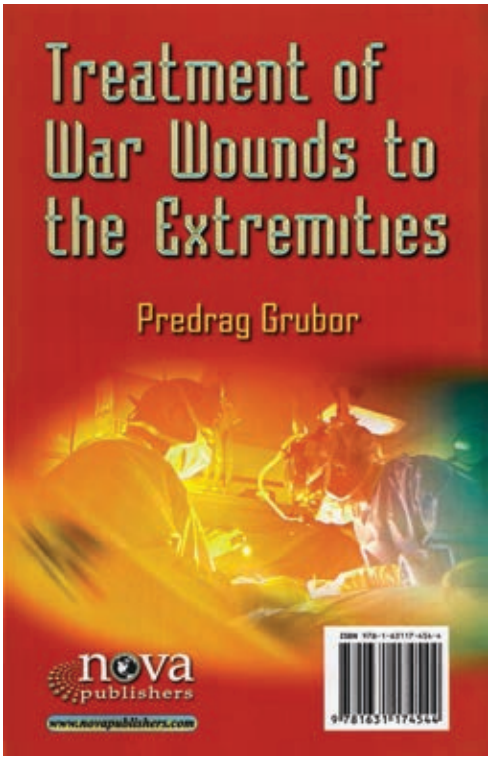


BOOK REVIEW

UDK 616.718.4/.8-001-089.23

Treatment of War Wounds to the Extremities

by Predrag Grubor



After a monography "*Tretment of Bone Defects*," published by the German publishing house LAP LAMBERT, in 2014, a publishing house Nova Science Publishers from New York published a monography written by prof. Predrag Grubor *Treatment of War Wounds to the Extremities*". The monography deals with primary care of war trauma and treatment of complications of the same. Simplicity of authentic surgical solutions that emerged in the disproportion between opportunities and needs, provided new approaches to surgical treatment. The publisher recognized value and importance of this book. This monography presents the author's experience in treating more than 5,000 injured people in the last war in Bosnia and Herzegovina. Author presents his experience in treatment of open fractures, peace and war trauma. Monography describes in detail when and what to use in primary care of war trauma, bone defects, osteomyelitis, nonunion, early spongioplasty in order to reduce the number of surgical interventions, biomechanics external fixator and so on.

Earlier firearms injuries were considered to be "the privilege" of military surgeons. Today we live in a world where there is a global conflict against terrorism and war wound has sadly become a daily routine of an orthopedic surgeon. Therefore, this monography has an important place in education and everyday surgical practice.

With this monography, Predrag Grubor, Phd, made an indelible mark in Serbian war surgery.

Milorad Mitković, PhD,
correspondent member of the SANU

Instructions for Autors

Scripta Medica (SM) is a peer-reviewed international journal published under the auspices of the Medical Society of the Republic of Srpska. The journal publishes original biomedical studies, including those addressing ethical and social issues. As a general medical journal, SM gives preference to clinically oriented studies over those on experimental animals. It publishes peer-reviewed original research papers, case reports, review articles, essays, special articles, clinical problem-solving, images in clinical medicine only in English. Book reviews and news are published only in Serbian. The full text of SM is available, free of charge, online at www.scriptamedica.com.

General instructions

1. Manuscripts should be submitted in the .DOC format (MicrosoftWord), using the Times New Roman font. The text should be single spaced in 11 point. The main heading should be 12 point **bold**. Subheadings should be 11 point **bold**. Tables must be in 10 point, single spaced; headings within tables should be in 10 point **bold**; the main table heading should be in 12 point **bold**; legends should be single spaced in 11 point. Illustrations can be submitted in either JPG or TIFF format (300 dpi or higher resolution).

2. Drugs and chemicals should be indicated by generic names. Instruments, apparatus or other devices are indicated by trade names, with the producer's name and place of production indicated in brackets.

3. Numbers in text and tables should be provided if expressed as %; means should be accompanied by SDs, and medians by interquartile range (IQR). In text, use following rule: spell out numbers up to ten and then use numerical designation for 10 and above.

4. All images must have minimum resolution of 300 dpi. The main figure heading should be in 10 point **bold**; legends should be single spaced in 10 point.

5. References should be indicated in the text sequentially in the Vancouver numbering style, as superscripted numbers after any punctuation mark.

6. Units of measurement, length, height, weight and volume are to be expressed in metric units (e.g., meter—m, kilogram—kg, liter—l) or subunits. Temperature should be in degrees Celsius (oC); quantities of substances are given in moles (mol), and blood pressure is expressed as millimeters of mercury (mm Hg). All values of hematological, clinical and biochemical measurements use the metric system according to the International System of Units (SI units).

7. Abbreviations may be used for very long names, including those of chemical compounds. The full name should be given when first mentioned in the text unless it is a standard unit of measurement. If abbreviations are to be used in the Abstract, each should be explained when first mentioned in the text. Well-known abbreviations, such as DNA, AIDS, HIV, ADP, ATP etc, dont need to be introduced by the full name. Titles should include abbreviations only when the abbreviation is universally accepted.

8. Authorship statement. To qualify for authorship, one must made substantial intellectual contributions to the study on which the article is based (WAME.com, Policy Statements—Authorship). The author should participate at least in one of these three categories:

a. research question, conception and design, data acquisition and analysis,

b. statistical analysis, interpretation of data, provision of funding, technical or material support, overall supervision of the project.

c. drafting or critical revision of the manuscript.

In some research projects may participate experts (such as biostatisticians or epidemiologists) that may not be equally familiar with all aspects of the work (for example, some clinical variables or laboratory measurements), but they may be qualified as the authors. A statement acknowledging contribution to the manuscript should be signed by all the authors. It will be published in the section "Author Contributions." The corresponding author is responsible for the integrity of the work as a whole. It is dishonest to omit mentioning the investigator who had important engagement with some aspects of the work.

9. Financial disclosure. A disclosure statement declaring any potential conflict of interest must be signed by each author. (See the policy statement on conflict of interest issued by the World Association of Medical Editors, WAME, www.wame.org or ICMJE uniform disclosure form for potential conflicts of interest, www.icmje.org.) This disclosure includes all affiliations or financial involvement (e.g., employment, consulting fee or honorarium, gifts, stock ownership or options, travel/accomodations expenses, grants or patents received or pending, and royalties) with any organization having a financial interest in or financial confl ict with the subject matter or materials discussed in the manuscript. This information will be held in confidence while the paper is under review. If the manuscript is accepted for publication, the editors will discuss with the author how such information is communicated to the reader in the section "Conflicts of interest."

10. Acknowledgment statement. The cover letter must state that the authors obtained written permission from all individuals named in an Acknowledgment or cited as personal communications.

11. Consent statement and permission obtained by the institutional ethics committee (IEC). A cover letter should state that written informed consent was obtained from all subjects (patients and volunteers) included in the study, and that the study was approved by the IEC.

The majority of these instructions are in accordance with "Uniform Requirements for Manuscripts Submitted to Biomedical Journals" (www.icmje.org).

12. Cover letter. The letter accompanying the submission should include the following:

a. A statement that the paper has not been previously published, nor is it concurrently submitted to any other journal,

b. A statement that the manuscript has been read and approved by all authors.

c. Assertion that written acknowledgments, consent statements and/or permission by the institutional ethics committee were obtained. This letter should be signed by corresponding author.

13. Submission of manuscripts. Manuscripts and all enclosures (cover letter, authorship statement and financial disclosures) should be sent by e-mail to editor@scriptamedica.com, preferably in one file. Signed copies of the cover letter and various statements may be faxed to +387 (51) 329-100. Submissions that do not comply with these instructions will be returned, unread.

14. Editorial process. Manuscripts deemed suitable for publication by in-house assessment will be reviewed by two or more outside experts. Contributors are encouraged to provide names of two or more qualified reviewers with experience in the subject of the submitted manuscript, but this is not mandatory. Page proofs of accepted articles will be sent to the corresponding author, and the corrected proofs should be returned within three days. The entire process, from the initial submission of the manuscript to the final review, including the sending and receiving of page proofs, can be completed online.

15. Review procedure. Manuscripts suitable for peer review will be sent to two outside reviewers. Some manuscripts may be accepted without revision, but if revision is required, the corresponding author must address each question, criticism and suggestion from the reviewers and editor. These topics can be addressed in a letter to the editor along with a revised manuscript. The acceptance rate for SM is around 60%.

16. For further information, please contact us at the following address:

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Specific instructions for a manuscript

Title page. The title page of the manuscript contains the title of the article, the full name of each author (without titles), and the departments and institutions of the author(s) in the order they are listed. The title page must also include the name of the corresponding author, (along with address, phone and fax numbers and e-mail address) to which the work should be attributed. A short running title should have no more than 40 characters, including spaces. The word count should be indicated as well. Original articles may have up to 2.500 words, excluding references and abstract.

The title should identify the main topic or the message of the paper. The standard title of a research paper is a phrase (rarely a sentence) that identifies the topic of the paper; it should be concise and precise, informative and descriptive.

The title of a descriptive paper should include the necessary description, function, purpose, animal species or population. When a method is described, the title should indicate whether it is new or improved.

Abstract and key words. Structured abstracts should be included in papers that report original research. Abstracts are limited to 250 words in four labeled paragraphs: Introduction, Materials and Methods, Results, and Conclusion. The abstract should state concisely the question that was asked or the objectives of the study, the methods that were used, the results obtained, and adequately answer the question posed in the introduction. The abstract should provide pertinent information when read alone. Below the abstract, authors should provide 3-6 key words or short phrases, according to terms from the Medical Subject Headings—MeSH (www.nlm.nih.gov/mesh).

Introduction. Generally, this section provides the motivation for the paper (i.e., what is missing or unknown in the research literature at this time), an overview of the scientific theory or conceptual models on which the research was based, and the purpose of the study and why it is important. Cite only relevant references.

Materials and methods. This section accurately describes the procedures used to carry out the study; it should be complete enough to permit others to replicate the study. Describe the methodological design, subjects, data sources, data collection methods, and any statistical and analytical procedures. These five parts may not be needed in all papers. Short papers may include these details in different paragraphs, but titled subsections may be used in longer papers. The Methods section should describe how the research was structured, how subjects or groups of subjects (defined by sex, age, and other characteristics) and how the subjects were chosen and assigned to these groups. Identify all drugs and chemicals by generic names, exact drug dosages and routes of administration. Variability should be expressed in terms of means and standard deviations (SD). Because SD and SEM are positive numbers, we recommend elimination of a +/- sign; instead, the SD may be given in brackets. For example, "systolic blood pressure in group of healthy students was 129 mm Hg [SD = 6, n = 87]." A p-value can be used to disprove the null hypothesis, but the authors should also give an estimate of the power of the study and state the exact tests used for statistical analysis.

Results. This section presents findings in logical sequence using the text, tables and illustrations. This section should show how the results of the study answer the research question. This may be shortest part of the entire paper. Details may be presented concisely in one or more tables or figures. Do not repeat the data presented in tables or illustrations in the text. Emphasize or summarize only important observations and how these answer the question posed in the introduction.

Tables. Each table (4 tables or figures are permitted) with its legends, should be self-explanatory and numbered in Arabic numerals in order of their mentioning in the text. The title should be typed above the table, and any explanatory text, including definitions of abbreviations, is placed below the table.

Illustrations (Figures). All figures (photographs, graphs, or schemes) should be numbered with Arabic numerals in the order of their mentioning in the text (a maximum of 4 figures or tables may be submitted). All lettering should be dark against a white background and of sufficient size to be legible when reduced for publication. Do not send original artwork, x-ray films, or ECG tracings but rather photographs of such material. Images need to be at least 300 DPI (JPG or TIF fi les). Figure legends should be typed double-spaced on a separate page with Arabic numerals corresponding to the figure. All symbols, arrows, numbers, or letters should be explained in the legend. An internal scale should appear on photomicrographs, and methods of staining should be described in the legend.

Discussion. Briefly state the principal finding that relates to the purpose or research question posed in the Introduction and follow the interpretation of the results obtained. Compare your findings with work reported previously by others. Discuss the implications of your findings and their limitations with respect to the methods used.

Acknowledgments. List all persons as well as financial and material supporters who helped to realize the project, even if they did not meet the criteria for authorship.

References. The reference list is the responsibility of the authors. List all the papers or other sources cited in describing previous or related research. Cite references in the text sequentially in the Vancouver numbering style, as superscripted number after any punctuation mark. For example: ...as reported by Vulić and colleagues.12 When two references are cited, they should be separated by comma, with no space. Three or more consequtive references are given as a range with an en rule. References in tables and figures should be in numerical order according to where the item is cited in the text. For citations according to the Vancouver style, see Uniform Requirements for Manuscripts Submitted to Biomedical Journals; this source gives the rules and formats established by the International Committee of Medical Journal Editors (www.icmje.org). If there are six authors or fewer, list all six by last name, space, initials, comma. If there are seven or more, list the first three in the same way, followed by et al. For a book, list the editors and the publisher, the city of publication, and year of publication. For a chapter or section of a book, give the authors and title of the section, and the page numbes. For online material, please cite the URL and the date you accessed the website.. Online journal articles can be cited using the DOI number. Do not put references within the Abstract section. All titles should be in English (the name of the original language should appear in brackets). See examples below that conform to the Uniform Requirements for Manuscripts Submitted to Biomedical Journals:

De Lacey G, Record C, Wade J. How accurate are quotations and references in medical journals. BMJ 1985; 291:884-6.

International Committee of Medical Journal Editors. Uniform requirements for manuscripts submitted to biomedical journals. Croat Med J 2003; 44:770-83.

Huth EJ. How to write and publish papers in the medical sciences. Philadelphia: ISI Press, 1982.

Davidović L, Marković M, Čolić M, et al. Treatment of traumatic rupture of the thoracic aorta. Srp Arh Celok Lek 2008; 136: 498-504.

Curtis MJ, Shattock MJ. The role of the manuscript assessor. In: Hall GM, ed. How to write a paper. London: BMJ Publishing Group; 1994: 89-95.

Electronic publications:

International Society of Scientometrics and Informatics Web site. Available at: http://www.issi-society.info Accessed March 20, 2012.

Lock SP. Journalology: are the quotes needed? CBE Views. 1989:1257-9. Available at: http://garfi eld.libraryupenn.edu/ essays/v13p019y1990.pdf. Accessed April 25, 2012.

Review article

Review articles are written by individuals who have studied a particular subject or area extensively, and who are considered experts. For these reviews, the word count may not exceed 2.500 words, excluding references and abstract. The manuscript may have up to 4 tables or illustrations, and as many as 50 references.

Case report

Case reports are most likely to be published if they describe any of the following: an unreported drug side effects (adverse or benefi cial), drug interactions; a new, unexpected, or unusual manifestation of a disease; previously unsuspected causal association between two diseases; presentations, diagnosis and/ or management of new and emerging diseases; an unexpected association between diseases or symptoms; an unexpected event in the course of observing or treating a patient, fi ndings that shed new light on the possible pathogenesis of a disease or an adverse effect; a previously unknown disease. *Scripta Medica* does not publish instructive case reports, that is, presentations that make important teaching point of what is already well known but often forgotten.

Case reports (no longer than 750 words) should include the following: title, case presentation (including up to three illustrations) and discussion, references (up to six), and an unstructured abstract in English or Serbian. The abstract may be a single paragraph containing no more than 100 words, and followed by key words. Title should facilitate retrieval with electronic searching. Case presentation should include the history, examination and investigations adequately, description of treatments, all available therapeutic options that have been considered and outcomes related to treatments. Discussion includes the following: statement an unusual diagnosis, prognosis, therapy; report of a literature review of other similar cases; explain rationale for reporting the case; what is unusual about the case; could things be done differently in a similar case?

Case reports may have as many as five authors. A very short case, about a particular disease can be submitted as a Letter to the Editor. Consent for publication must be obtained from the patients involved; if this is not possible, permission from a close relative or guardian must be obtained before submission.

In a cover letter authors should indicate how the case report contributes to the medical literature. Submissions that do not include this information will be returned to authors prior to peer review. For all case reports, informed written consent is required; the cover letter should state that consent was obtained. Authorship statement and financial disclosure should be presented.

Images in clinical medicine

The editors will consider original, clear and interesting images that depict new or "classic" clinical pictures submitted along with a descriptive paragraph of up to 200 words. The report may include two authors and three references. The authors must obtain a signed, informed consent from the patient or from a close relative or guardian. The cover letter from the corresponding author should state that written consent was obtained.

Clinical problem-solving

Solutions for various clinical problems, including certain clinical studies, should include the following sections: Abstract, Introduction, Methods or Case(s) Presentation, up to four tables or illustrations, Discussion, References (maximum 20). The unstructured Abstract must be in English and be limited to 150 words, and followed by key words. This type of communication should not exceed 1400 words in all, including references and tables. Authors must obtain signed informed consent directly from the patients involved or from a close relative or guardian before submission. The cover letter should note that consent was obtained. Authorship statement and financial disclosure should be presented.

Letter to the editor

If the letter refers to a recent journal article, it should not exceed 250 words, excluding references. All letters should be brief and to the point with no more than five reference citations. Figures or tables are not permitted in this format. Financial disclosure should be presented.

Editorial

Editorials are solicited by the editor to provide perspective on articles published in the journal and/or to express the general policies or opinions of the Editorial Board.

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Special articles of 1500 words or less may be devoted to any medical problem, historic perspective, education, demography, or contemporary issues. Up to 15 references may be cited, and the piece may contain 2 tables or illustrations.

An unstructured abstract in English (150 words or less) should accompany a specific article. Finacial disclosure should be presented.

Press Release

The authors of a particularly interesting or significant articles may be asked by the editor of the *Scripta Medica*, or directly by the media, to write a press release, a text that will help spread the message to wide audience. Neither authors nor journalists should distribute unpublished reports until the journal's media embargo has expired.

Press release should be between 150 and 250 words long and convey the main message in short sentences and understandable terms. Lay terminology should be used whenever possible, and technical words and abbreviations should be explained when first used. For lay readers and listeners approximations are preferable to percentages when reporting data. For example, 9% becomes "nearly one in ten", and 55% becomes "more than half". The press release should contain the name address, telephone, and e-address of the primary or senior author, but if there are multiple authors, one could be selected to talk to the media. When appropriate, *Scripta Medica* may organize a press conference to present interesting articles. The authors will be invited, and the press releases will be distributed.

SUBMISSION OF PAPERS

- Manuscripts, tables and figures should be emailed to editor@scriptamedica.com, whenever it is possible, **all in one file.**

Signed cover letter and the statements can be scanned and submitted electronically together with previous materials or faxed to +387 (51) 329-100.

To minimize delays, we advise that you prepare signed copies of all statements before submitting the manuscript.

SIGNATURES

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- Authorship statement
- Financial disclosure statement