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TREND INCIDENCIJE I MORTALITETA OD KARCINOMA USNE U CENTRALNOJ SRBIJI U PERIODU OD 1999. DO 2014.

TREND OF THE INCIDENCE AND MORTALITY RATE OF LIP CANCER IN CENTRAL SERBIA FROM 1999-2014

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Sažetak

Uvod: *Karcinom usne je najčešći oralni karcinom.*
Cilj *ovog rada bio je da se prikaže i proceni trend incidencije i mortaliteta od karcinoma usne u centralnoj Srbiju u periodu od 16 godina, od 1999. do 2014.*
Materijal i metode: *Epidemiološka studija zasnovana je na podacima koji su javno dostupni iz registra karcinoma "Incidencija i mortalitet od raka u centralnoj Srbiji" koji objavljuje Institut za javno zdravlje Srbije za period od 1999. do 2014. godine. Trend i godišnja procentualna promena (APC), sa odgovarajućim 95% intervalom poverenja, izračunati su pomoću joinpoint regresione analize.*
Rezultati: *U centralnoj Srbiji, u periodu 1999. - 2014. godine, registrovano je ukupno 1922 novoobolelih od karcinoma usne (1402 muškarca i 520 žena). Stopa incidencije i standardizovana stopa incidencije imaju statistički značajan trend pada u muškoj populaciji (p = 0,001, odnosno p < 0,001) tokom ispitivanog perioda, sa APC 4,3%, odnosno 5,2%. Kod žena, incidencija i standardizivana stopa incidencije pokazuju statistički značajan trend pada u periodu 2003.- 2011. godine, odnosno 2006. - 2011. godine, sa APC 12,3, odnosno 24,3%. Standardizovana stopa mortaliteta kod muškaraca pokazuje statistički značajan trend pada kod muškaraca sa APC, 4,5%.*
Zaključak: *U ispitivanom periodu trend incidencije kod muškaraca pada. Kod žena trend je divergentnog karaktera. Stopa mortaliteta karcinoma usne kod oba pola je niska i stabilna.*

Ključne reči: *karcinom usne, incidencija, mortalitet, registar karcinoma, trend*

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Abstract

Background: *Lip cancer is the most frequent oral cancer.*
The aim *of this study was to present and estimate trends in the incidence and mortality of lip cancer in Central Serbia during a 16-year period, from 1999 to 2014.*
Material and methods: *This registry-based study was carried out based on the data extracted from publicly available Yearbooks of the Institute of Public Health of Serbia – Incidence and Mortality in Central Serbia, from 1999 to 2014. The trend and the annual percentage change (APC) of the incidence and mortality rate with the corresponding 95% confidence intervals were calculated by performing joinpoint regression analyses.*
Results: *A total number of 1,922 cases (1,402 in men and 520 in women) of lip cancer were registered in Central Serbia from 1999 to 2014. The crude rate (CR) and age-standardized rate (ASR-W) of the incidence in males decreased (p=0.001, p<0.001, respectively) during the study period with APC of 4.3%, 5.2%, respectively. In females, CR and ASR-W of incidence showed the only significant trend between 2003-2014, 2006-2014, respectively with APC 12.3, 24.3%, respectively. ASR-W of mortality rate in males showed the decreasing trend with APC 4.5%.*
Conclusions: *Our results reveal that the incidence of lip cancer declines trough the study period. The mortality rate is low and stable.*

Key words: *lip cancer, incidence rate, mortality rate, cancer registry, trends*

Uvod

Razvoj kancera nastaje usled interakcije različitih faktora rizika, kako unutrašnjih, kao što je genetska predispozicija, tako i spoljašnjih, kao što su životne navike i faktori sredine. Karcinom usta, zajedno sa drugim oralnim i faringealnim karcinomima, šesti je najčešći karcinom [1,2]. Karcinom usta se predominantno javlja kod muškaraca [3]. Muška predominantnost je rezultat profesionalne i razlike u ponašanju između polova. Rad i aktivnosti na otvorenom su daleko češći kod muškaraca. Pored toga, najčešće je ovim karcinomom zahvaćana populacija starija od 60 godina. Preko 60% novoobolelih od karcinoma usta su stariji pacijenti [4].

Skvamocelularni karcinom (SCCs) je dominantni histopatološki tip karcinoma usta [5]. SCCs je karakterističan za karcinom donje usne, dok se bazocelularni karcinomi (BCC) mnogo češće javljaju na gornjoj usni [6, 7]. Zbog svoje lokalizacije, karcinom usta deli faktore rizika sa karcinomima kože, oralnim karcinomima i karcinomima nasofarinksa. Zbog toga su glavni faktori rizika za nastanak karcinoma usne: pušenje, konzumacija alkohola, izlaganje sunčevom zračenju, posebno za spoljašnji karcinom usne [8].

Srbija je prepoznata kao zemlja sa velikim udelom oralnih karcinoma koji se potencijalno mogu izbegnuti [9]. Zato je cilj ovog rada bio da prikaže i proceni trend incidencije i mortaliteta od karcinoma usne u centralnoj Srbiji u periodu od 1999. do 2014.godina.

Materijal i metode

Ova epidemiološka studija je sprovedena na osnovu podataka dobijenih iz javno dostupnog registra kancera – "Incidencija i mortalitet od raka u centralnoj Srbiji" koji objavljuje Institut za javno zdravlje Srbije za period od 1999. do 2014. godine, u kojima su incidencija i mortalitet prikazani prema polu i starosnoj strukturi i prema dijagnozi. Standardizovane stope incidencije i mortaliteta su izračunate na osnovu ovih podataka za oba pola. Karcinom usne je kodiran prema Međunarodnoj klasifikaciji bolesti – deseta revizija [10]. Odnos mortaliteta i incidencije (MIR) je dobijen deljenjem stope mortaliteta i incidencije i deljenjem standardizovane stope mortaliteta i standardizovane stope incidencije za svaku godinu.

Introduction

Cancer develops in the interaction of risk factors which include internal factors such as genetic susceptibility and hormonal factors and external factors such as life style and environmental factors. Lip cancer, along with other oral and pharyngeal cancer is the sixth most common cancer type worldwide [1, 2]. Lip cancer is far more common in men [3]. Male predominance is a result of occupational and behavioral differences among sexes. Outdoor working and outdoor activities are far more frequent in males. The population over 60 is the most affected with lip cancer. Over 60% of new cases of lip cancer occurred in older patients [4].

Squamous cell carcinomas (SCCs) is the dominant histological type of lip cancer [5]. SCCs are typical of the lower lip, while basal cell carcinoma (BCC) is more frequent in the upper lip [6, 7]. Because of its location, lip cancer shares risk factors with skin cancers and cancers of the oral cavity and nasopharynx. Therefore, the main risk factors for lip cancer are: smoking, alcohol consumption and sun exposure, especially for external lip cancer [8]. Serbia was recognized as a country with a large proportion of potentially avoidable oral cancer[9].The aim of this study was to present and estimate trends in the incidence and mortality of lip cancer in Central Serbia from 1999 to 2014.

Materials and Methods

This registry-based study was carried out based on the data extracted from publicly available Yearbooks of the Institute of Public Health of Serbia – Incidence and Mortality in Central Serbia, from 1999 to 2014, in which the incidence and mortality rates were aggregated and stratified by sex, 5-year age groups, and diagnosis. The age-standardized incidence and mortality rate in both sexes were calculated based on those data. Lip cancer was coded according to the tenth Revision of International Classification of Disease (codes C00-C96) [10]. Mortality to incidence ratio (MIR) was calculated by dividing the crude rate of mortality by crude rate of incidence for each year. The trend and the annual percentage change (APC) of the incidence and mortality rate with corresponding 95% confidence intervals (95% CI) were calculated by performing join point

Trend i godišnja procentualna promena incidencije i mortaliteta sa 95% intervalom poverenja (95%CI) izračunati su joinpoint regresionom analizom. Optimalan broj prelomnih tačaka dobijen je metodom Monte Karlo permutacije. Za analizu trenda korišćen je programski paket Joinpoint Regression Program verzija 4.1.0 (dostupan na http: //surveillance.cancer.gov/joinpoint). Promena trenda je smatrana statistički značajnom ukoliko je p-vrednost manja od 0,05.

Rezultati

U centralnoj Srbiji su u periodu 1999.- 2014. registrovana ukupno 1922 novoobolela od karcinoma usne (1402 muškarca i 520 žena). Odnos muškaraca prema ženama je 2,8:1. Tabela 1 prikazuje distribuciju novoobolelih od ovog karcinoma, stopu incidencije i mortaliteta, standardizivane stope incidencije i mortaliteta (ASR-W, standardizovane na svetsku populaciju) i MIR za prikazane stope u ispitivanom periodu kod muškaraca u centralnoj Srbiji. Najveća stopa incidencije i standardizovana stopa incidencije kod muškaraca bila je 2001. godine (5,0, odnosno 2,9), a najniža stopa incidencije i standardizivana stopa incidenicije bila je 2011. godine (1,5, odnosno 0,8). Kod muškaraca, najviši mortalitet i standardizovana stopa mortaliteta bila je 2006. (0,9, odnosno 0,4), a najniža u 2012. godini (0,3, odnosno 0,2). Kod žena, najviša stopa incidencije i standardizovana stopa incidencije bila je u 2009. godini, a najniža vrednost ovih stopa bila je u 2010. i u 2011. godini (1,9, odnosno 1,0). Najviša vrednost mortaliteta i standardizovana stopa mortaliteta kod žena bile su u 1999. i 2012. godini (0,4, odnosno 0,2). Zajednička tačka regresione analize incidencije kod muškaraca pokazuje statistički značajan trend pada u periodu 1999.- 2014. sa APC 4,3% (95%CI - 6,5 - -2,0%, p=0,001). Kod žena, stopa incidencije pokazuje trend blagog porasta, koji nije statistički značajan u periodu 1999- 2003. i 2011-2014. godine, i trend statistički značajnog pada u periodu 2003.- 2011. sa APC 12,3% (95%CI -19.1 - -5,0%, p = 0,008) (Tabela 3, Slika 1). Stopa mortaliteta kod oba pola je pokazala trend pada vrednosti koji nije statistički značajan u ispitivanom periodu (Slika 2).

regression analyses. The optimal number of joinpoints was identified using the Monte Carlo permutation method. For trend analyses, the Joinpoint Regression Program version 4.1.0 was used (available at http: // surveillance.cancer.gov/joinpoint). The trend was considered to be significantly changing when the p-value was below 0.05 ($p < 0.05$).

Results

A total number of 1,922 cases (1,402 in men and 520 in women) of lip cancer were registered in Central Serbia from 1999 to 2014. The men to women ratio was 2.8:1. Table 1 presents the distribution of new cases of lip cancer, the crude rate of incidence and mortality, the age-standardized incidence and mortality rate (ASR-W; to the world population) and mortality to incidence rate (MIR) to the specified rates according to the years of observation in males. The highest CR and ASR-W of incidence in males were in 2001 (5.0, 2.9 respectively), and the lowest values of those rates were in 2011 (1.5, 0.8 respectively). In males, the CR and ASR-W of mortality rate were highest in 2006 (0.9, 0.4, respectively), and lowest in 2012 (0.3, 0.2, respectively).

In females, the highest CR and ASR-W of incidence in 2009 (1.9, 1.0, respectively), and the lowest values of those rates were in 2010 and 2011 (0.6, 0.2, respectively). In females, the CR and ASR-W of mortality rate were highest in 1999 and 2012 (0.4, 0.2, respectively).

Joinpoint analysis of the crude rate of incidence of lip cancer in males showed a significantly decreasing trend between 1999 and 2014 with APC 4.3% (95%CI -6.5 - -2.0%, p = 0.001). In females, the crude rate of the incidence of lip cancer showed a non-significantly increasing trend between 1999 and 2003 and between 2011 and 2014, and a significantly decreasing trend between 2003-2011 with APC 12.3% (95%CI -19.1- -5.0%, p=0.008) (Table 3, Figure 1). Crude rates of mortality of lip cancer in both sexes showed a non-significant decreasing trend between 1999 and 2014 (Figure 2).

Tabela 1. Broj novoregistovanih pacijenata, stopa incidencije i mortaliteta i standardizovana stopa incidecnije i mortaliteta karcinoma usta kod muškaraca u centralnoj Srbiji od 1999. do 2014.

Table 1. The number of newly registered cases, the crude rate and the age-standardized incidence and mortality rate of lip cancer in males from Central Serbia from 1999-2014

Year	Incidence			Mortality			MIR of CR	MIR of ASR-W
	Count	CR	ASR-W	Count	CR	ASR-W		
1999	105	3.9	2.1	18	0.7	0.4	0.18	0.19
2000	107	4.0	2.3	16	0.6	0.3	0.15	0.13
2001	132	5.0	2.9	13	0.5	0.3	0.10	0.10
2002	108	4.1	2.3	17	0.6	0.3	0.15	0.13
2003	93	3.5	2.0	10	0.4	0.2	0.11	0.10
2004	115	4.3	2.5	12	0.5	0.2	0.12	0.08
2005	92	3.5	1.8	17	0.6	0.3	0.17	0.17
2006	91	3.5	1.8	23	0.9	0.4	0.26	0.22
2007	74	2.8	1.6	13	0.5	0.2	0.18	0.13
2008	75	2.9	1.5	22	0.8	0.4	0.28	0.27
2009	90	3.5	1.8	12	0.5	0.2	0.14	0.11
2010	72	2.8	1.5	10	0.4	0.2	0.14	0.13
2011	40	1.5	0.8	14	0.5	0.2	0.33	0.25
2012	77	3.0	1.6	8	0.3	0.1	0.10	0.06
2013	58	2.3	1.1	10	0.4	0.2	0.17	0.18
2014	73	2.9	1.4	15	0.6	0.2	0.21	0.14

CR – crude rate, ASR – W – the age - standardized rate

Tabela 2. Broj novoregistovanih pacijenata, stopa incidencije i mortaliteta i standardizovana stopa incidecnije i mortaliteta karcinoma usta kod žena u centralnoj Srbiji od 1999. do 2014.

Table 2. The number of new cases, the crude rate and the age-standardized incidence and mortality rate of lip cancer in females from Central Serbia from 1999-2014

Year	Incidence			Mortality			MIR of CR	MIR of ASR-W
	Count	CR	ASR-W	Count	CR	ASR-W		
1999	25	0.9	0.5	10	0.4	0.2	0.44	0.40
2000	27	1.0	0.5	4	0.1	0.1	0.10	0.20
2001	43	1.5	0.7	9	0.3	0.1	0.20	0.14
2002	48	1.7	0.8	7	0.2	0.1	0.12	0.13
2003	53	1.9	1.0	3	0.1	0.0	0.05	0.00
2004	33	1.2	0.5	9	0.3	0.1	0.25	0.20
2005	43	1.5	0.8	8	0.3	0.1	0.20	0.13
2006	36	1.3	0.7	4	0.1	0.0	0.08	0.00
2007	39	1.4	0.6	5	0.2	0.0	0.14	0.00
2008	33	1.2	0.5	3	0.1	0.0	0.08	0.00
2009	28	1.0	0.4	5	0.2	0.0	0.20	0.00
2010	17	0.6	0.2	6	0.2	0.1	0.33	0.50
2011	17	0.6	0.2	7	0.3	0.1	0.50	0.50
2012	21	0.8	0.3	10	0.4	0.1	0.50	0.33
2013	28	1.0	0.3	3	0.1	0.0	0.10	0.00
2014	29	1.1	0.4	3	0.1	0.0	0.09	0.00

CR – crude rate, ASR-W – the age-standardized rate

Tabela 3. Analiza trenda incidencije i mortaliteta karcinoma usta u centralnoj Srbiji u periodu od 1999. do 2014.

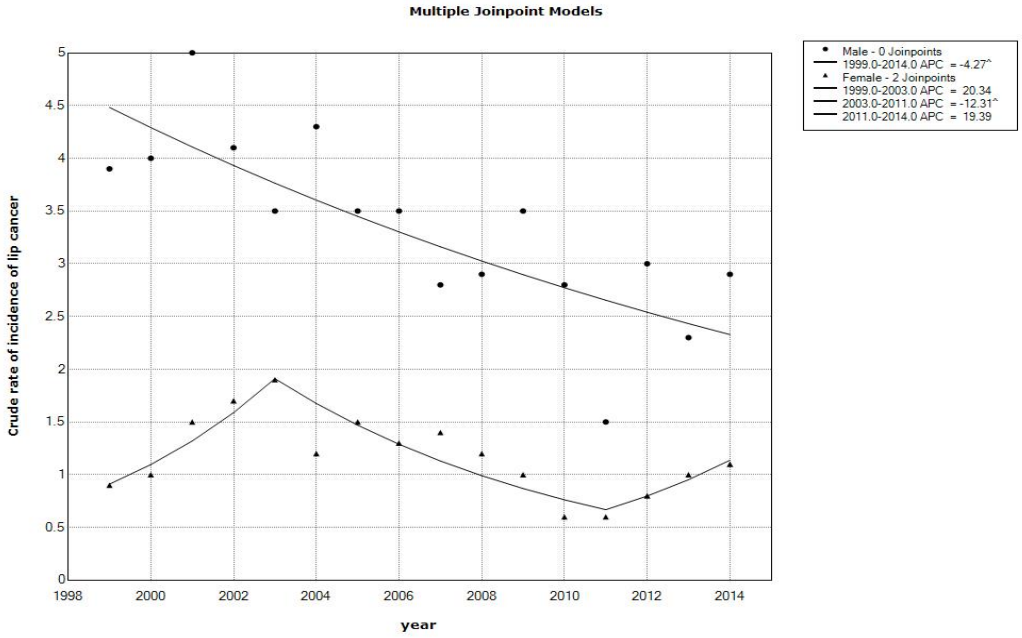
Table 3. Joinpoint analysis of the trend in the crude rate of incidence and mortality rate of lip cancer in Central Serbia from 1999-2014

Crude rate - Incidence	**Segment**	**Period**	**APC**	**95%**	**p-value**
Male - 0 Joinpoints	1	1999-2014	-4.3^	-6.5 - -2.0	0.001
Female - 2 Joinpoints	1	1999-2003	20.3	-0.5 -45.6	0.055
Female - 2 Joinpoints	2	2003-2011	-12.3^	-19.1 - -5.0	0.008
Female - 2 Joinpoints	3	2011-2014	19.4	-11.7 -61.4	0.052
Crude rate -mortality					
Male - 0 Joinpoints	1	1999-2014	-2.1	-5.1-1.0	0.163
Female - 0 Joinpoints	1	1999-2014	-2.0	-8.1-4.5	0.511
ASR-W Incidence rate					
Male - 0 Joinpoints	1	1999-2014	-5.2^	-7.4 - -2.9	<0.001
Female - 2 Joinpoints	1	1999-2006	5.2	-5.2 – 16.7	0.296
Female - 2 Joinpoints	2	2006-2011	-24.3^	-40.9 - -3.1	0.031
Female - 2 Joinpoints	3	2011-2014	26.9	-14.1 – 87.4	0.197
ASR-W Mortality rate					
Male – 0 Joinpoints	1	1999-2014	-4.5^	-7.8 – -2.8	0.015
Female -	Not calculated				

^ indicates that the Annual Percent Change (APC) is significantly different from zero at the alpha = 0.05 level, 95%CI – 95% confidence interval, trend for ASR-W mortality rate for females was not calculated

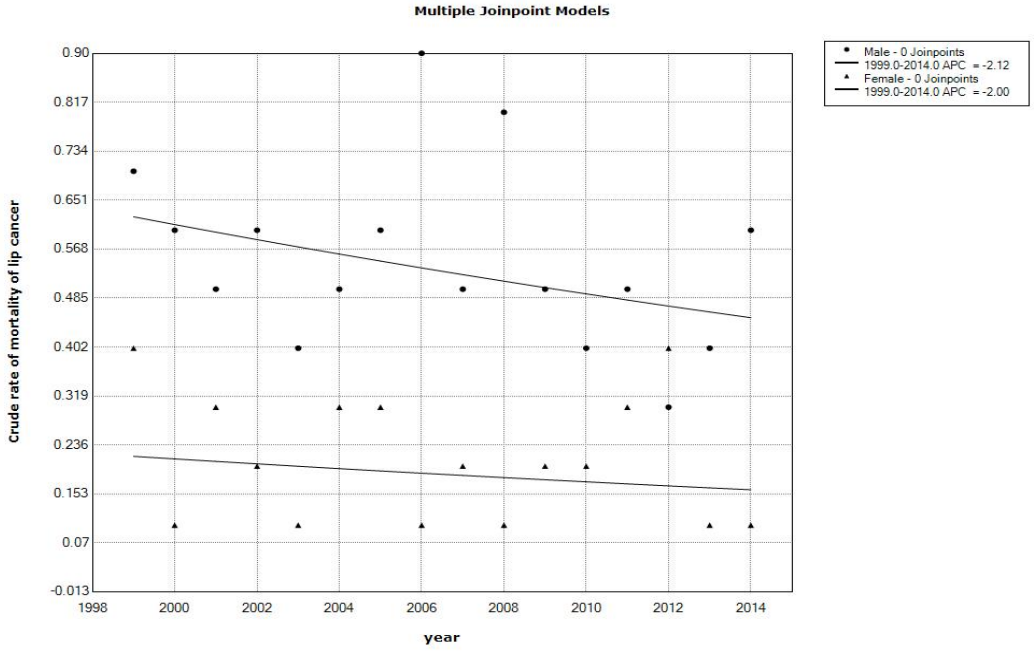
Standardizovana stopa incidencije kod muškaraca je pokazala statistički značajan trend pada vrednosti u periodu 1999.-2014. sa APC 5,2% (95%CI -7,4 - - 2,9%, p < 0,001). Kod žena je standardizovana stopa incidencije pokazala statistički značajan trend pada u periodu 2006.-2011. godine, sa APC -24,3% (95%CI -40.9 - - 3.1, p = 0,031) (Slika 3). Standardizovana stopa mortaliteta od karcinoma usne kod muškaraca je pokazala statistički značajan trend pada u ispitivanom periodu sa APC 4,5% (95%CI -7.8 - -2,8, p = 0,015) (Slika 4).

The age-standardized incidence rate in males showed a significantly decreasing trend between 1999 and 2014 with APC 5.2% (95%CI -7.4 - -2.9%, p < 0.001). In females, the age-standardized incidence rate of lip cancer showed the only significant trend between 2006 and 2011 with APC -24.3% (-95%CI -40.9 - -3.1, p=0.031)(Figure 3). The age-standardized mortality rate of lip cancer in males showed a significantly decreasing trend during the period from 1999-2014 with APC -4.5% (95%CI -7.8 - -2.8, p = 0.015)(Figure 4).



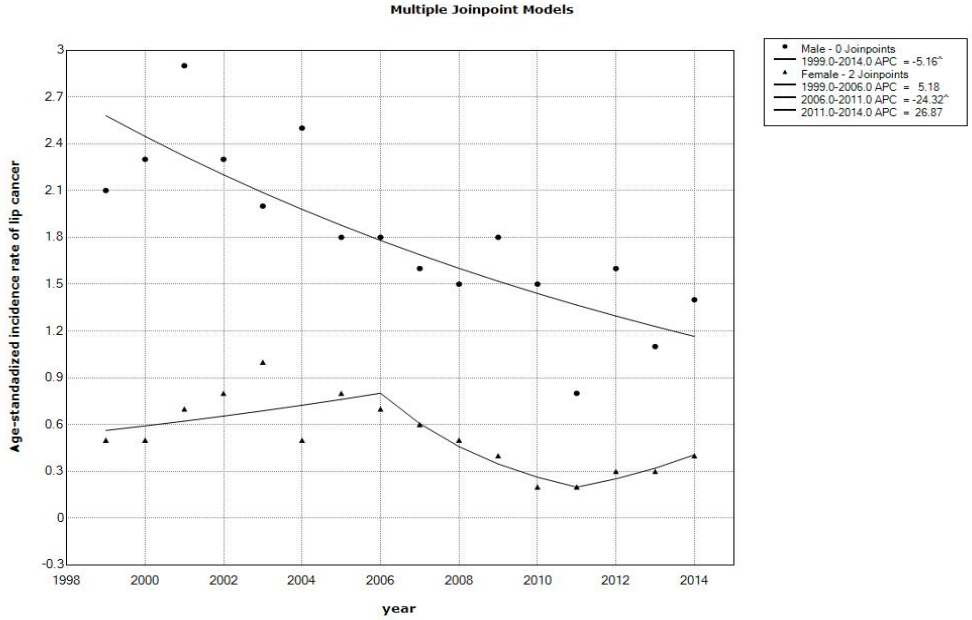
Slika 1. Trend stope incidencije karcinoma usta u centralnoj Srbiji u periodu od 1999. do 2014.

Figure 1. The trend of crude rate of incidence of lip cancer in Central Serbia from 1999-2014



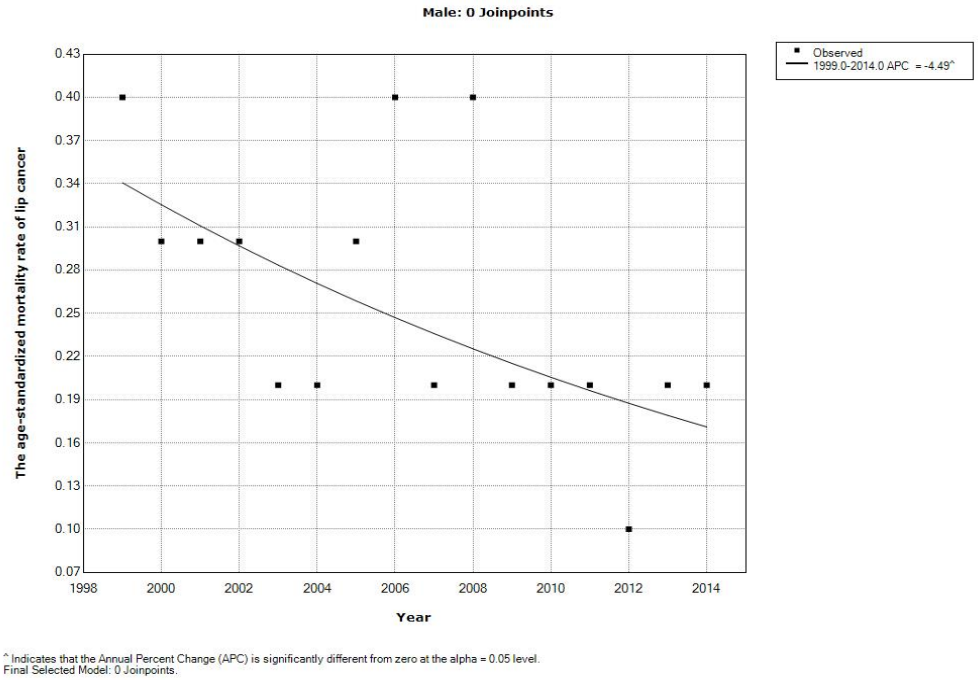
Slika 2. Trend mortaliteta karcinoma usta u centralnoj Srbiji u periodu od 1999. do 2014.

Figure 2. The trend of crude rate of mortality of lip cancer in Central Serbia from 1999-2014



Slika 3. Trend stanadardizovane stope incidencije karcinoma usta u centralnoj Srbiji u periodu od 1999. do 2014.

Figure 3. The trend of ASR-W of incidence of lip cancer in Central Serbia from 1999-2014



Slika 4. Trend stanadardizovane stope mortaliteta karcinoma usta u centralnoj Srbiji u periodu od 1999. do 2014.

Figure 4. The trend of ASR-W of mortality of lip cancer in Central Serbia from 1999-2014

Diskusija

Glavni nalaz ove studije je trend pada incidencije karcinoma usne kod muškaraca i niska, bez promena, vrednost mortaliteta kod oba pola. U ispitivanom periodu kod žena postoji divergenti trend, nakon statistički značajnog pada incidencije u periodu 2006.-2011, postoji trend blagog porasta koji nije statistički značajan sve do kraja ispitivanog perioda. Rezultati pada trenda incidencije karcinoma usne su u skladu sa podacima koji su objavljeni za grad Beograd za period 1999.-2011 [11]. Profil karcinoma usne u Beogradu se gotovo kompletno poklapa sa profilom za centralnu Srbiju koji je dobijen u ovom istraživanju. Globalno gledano, smanjenje incidenicije u centralnoj Srbiji se poklapa sa podacima publikovanim za Evropu (3) i Sjedinjenje Američke Države [12]. Odnos muškarac/žena (2,8) približan je vrednostima koje su dobijene na globalnom nivou (2,5) [4]. Generalno, smanjenje ovog odnosa je registrovano delom zbog smanjenja incidencije kod muškaraca, a delom i zbog povećanja incidencije kod žena, posebno zbog porasta incidencije karcinoma gornje usne [3, 13].

Nedavno publikovana studija[3] je utvrdila da je 60% oralnih karcinoma, karcinoma jednjaka, larinksa, grlića materice i mokraćne bešike moguće izbeći, odnosno prevenirati. Stoga, fokus javnog zdravlja treba da bude na merama prevencije i smanjenja učestalosti faktora rizika. Glavni faktori rizika za karcinom usne su: pušenje[3,14], konzumiranje alkohola[15,16] i izlaganje sunčevom zračenju. Prvi korak u smanjenju faktora rizika za nastanak ovog karcinoma na nacionalnom niovu je postignut donošenjem zakona o zaštiti stanovništva od izloženosti duvanskom dimu[17].

Ipak, Srbija i dalje ima reputaciju zemlje sa vrlo visokom prevalencijom pušenja, smatra se delom jer je pušenje povezano sa brojnim socio-ekonomskim faktorima. Studija sprovedena u našoj zemlji je pokazala da su najveći zavisnici od pušenja bile najsiromašnije žene [18]. Pušenje i konzumiranje alkohola su dobro utvrđeni faktori rizika [1, 19]. Pušenje i konzumiranje alkohola imaju i individualno i sinergističko dejstvo. Kombinacije pušenja i teškog alkoholizma stvara 38 puta veću šansu za razvoj karcinoma usne u odnosu na one koji ne upražnjavaju nijednu od ovih navika [20]. Osim toga, visoka stopa incidencije ovog karcinoma se poklapa teritorijalno sa velikom konzumacijom alkohola u centralnoj i istočnoj Evropi [4].

Discussion

The main finding of the study is a decreasing trend of the incidence of lip cancer in men and low and stable mortality in both sexes. In the study period, the incidence rate in females showed divergent trends, and after a significant decrease in the incidence between 2006 and 2011, there was the trend of a non-significant increase until the end of the study period. The results of significantly decreased rates are also coherent with the data published for lip cancer in Belgrade from 1999-2010 [11]. Lip cancer profile in Belgrade almost matches Central Serbia profile. In global terms, a declining incidence trend of lip cancer in Central Serbia parallels observations from Europe (3) and the United States [12]. The male:female ratio (2.8) is similar to the global M/F ratio (2.5)[4]. Generally, a declining trend of M/F ratio was noticed partly due to decreasing of incidence in males, and partly due to rising of incidence in females, especially the incidence of the upper lip cancer [3, 13].

A recently published study [9] established that 60% of cancers of the oral cavity, the oesophagus, the larynx, the corpus uteri and the bladder are considered to be avoidable which indicates great opportunities for prevention. Therefore, the focus of public health activities should be on measures of prevention and reduction of lip cancer risk factors. The main modifiable risk factors for lip cancers are smoking [3, 14] and alcohol consumption [15, 16] and sun exposure. The first step in risk factors reduction at the national level was done with the creation of a legislation framework for tobacco control [17].

Yet, Serbia still has a reputation of a country with a very high prevalence of smoking. The smoking cessation is also related to socio-economic factors. It was established that the most addicted people were the poorest women [18]. Smoking and alcohol consumption are well established risk factors [1, 19]. Smoking and drinking alcohol have an individual and synergistic effect. The combination of smoking and heavy drinking creates 38 times higher risk for lip cancer compared to the risk of abstainers from both habits [20]. The high lip cancer incidence matched the great alcohol consumption in Central and Eastern Europe[4]. The above-mentioned findings suggest that high prevalence of risk factors for lip cancer was registered in Serbia only in a few studies, which implies that improved and expanded surveillance of risk factors at the national level is needed.

Gore pomenuti nalazi ukazuju da je visoka prevalencija faktora rizika za nastanak ovog karcinoma registrovana u Srbiji u samo nekoliko studija i da je potreban poboljšani i proširenі nadzor ovih faktora rizika na nacionalnom nivou.

Trend pada incidencije karcinoma usne kod muškaraca može biti prvi rezultat kontrole pušenja u našoj zemlji. Osim toga, može biti i posledica manje izloženosti sunčevom zračenju usled smanjenja populacije u ruralnim oblastima [21]. Sličan efekat se može dobiti i smanjenjem aktivnosti na otvorenom. Sunčeva svetlost i zračenje se ubrajaju u snažne sugestivne faktore rizika [19]. Efekat izlaganja sunčevom zračenju na sam mehanizam nastanka karcinoma usne zavisi od vremena izlaganja i tipa aktivnosti. Dugoročno izlaganje suncu na poslu je prediktor za nastanak karcinoma usne, a izlaganje tokom odmora i slobodnog vremena izgleda da ima zaštitini efekat [22]. U grupu potencijalnih faktora rizika posebnu pažnju privlači HPV infekcija [23]. Nedavno objavljeni podaci pokazuju da je ukupna HPV prevalencija i 16/18 HPV prevalencija u Srbiji kod žena zdravog izgleda i normalnog citološkog nalaza na grliću materice vrlo visoka [24]. Time se zaokružuje slika o Srbiji kao zemlji sa visokom prevalencijom faktora rizika za karcinom usne.

Gotovo ceo ispitivani period karakteriše nizak MIR, što ukazuje na pravovremenu dijagnozu ovog karcinoma u centralnoj Srbiji. Svakako da su rana detekcija i lečenje povezani sa boljim ishodom, zato je razvoj skrining programa neophodan, posebno u mlađoj populaciji [25].

Globalna standardizivana stopa incidencije za karcinom usne u 2012. godini je procenjena na 0,3/100000, sa vrlo izraženim regionalnim razlikama. Prema GLOBOCAN-ovim procenama, incidencija ovog karcinoma kod muškaraca u Srbiji je u 2012. godini rangirana na 12. mestu, a na 21. kod žena. Razmatrajući stopu mortaliteta, prema GLOBOCAN-ovim procenama, Srbija se nalazi na 15. mestu po smrtnosti u muškoj populaciji i na 14. po smrtnosti u ženskoj populaciji. Centralna i istočna Evropa se smatraju regionom sa visokom stopom prevalencije karcinoma usne [19, 26]. Gotovo petina novih slučajeva (19,2%) se javlja na prostoru centralne i istočne Evrope [4]. Dakle, Srbija je okružena zemljama sa vrlo visokom učestalošću ovog karcinoma. Najveće stope karcinoma usne su posebno karakteristične za sledeće zemlje istočne Evrope, posebno u muškoj populaciji: u Bugarskoj, Češkoj, Mađarskoj, Poljskoj, Rumuniji i Slovačkoj [27]. Izrazito visoke stope smrtnosti su registrovane u Mađarskoj devedesetih godina prošlog veka.

The decreasing trend of lip cancer incidence in males might be the first result of controlling tobacco use. Additionally, the downward trend of lip cancer incidence in males may also be caused by less sunlight exposure due to a reduction in the population living in rural areas [21]. A similar effect could be achieved with a reduction of outdoor occupancy. Sunlight and radiation were established as strongly suggestive risk factors for lip cancer [19].The effect of sunlight exposure on the carcinoma mechanism depends on the time of exposure and different activities. Long-term and constant exposure to sunlight during work is a predictor of lip cancer, but exposure during holidays and leisure seems to have a protective effect [22]. In the group of possible risk factors of lip cancer, special attention was drawn to the HPV infection [23]. Recent data showed that the prevalence of the overall and 16/18 HPV infections in Serbian women was high in women with a healthy appearance and a cytologically normal cervix [24]. The above-mentioned facts complete the image of Serbia as a region with the high prevalence of lip cancer risk factors.

Almost the whole of the study period is characterized by low mortality/incidence ratio, which implies that lip cancer was timely diagnosed in Central Serbia. The early detection and treatment of lip cancer are related to better prognosis. Therefore, the development of screening program is needed, especially in younger population that is affected [25].

The global ASR-W of lip cancer in 2012 was estimated at 0.3/100,000 with pronounced regional differences. Regarding the GLOBOCAN estimates in 2012, Serbia was ranked at the 12th place by the incidence rate of lip cancer in males and at the 21st place by the incidence of lip cancer in females. Considering the mortality rate, this comparison with GLOBOCAN 2012 estimates showed that Serbia was placed at the 15th place in males and at the 14th place in females. Central and Eastern Europe is considered as a region with a relatively high incidence rate of lip cancer [19, 26]. Almost one fifth of new cases (19,2%) occurred in Central and Eastern Europe [4]. Serbia is surrounded with countries with the high prevalence of this cancer. The highest rates of lip cancer mortality are typical for Eastern Europe [27], particularly for males from Bulgaria, the Czech Republic, Hungary, Poland, Romania and Slovakia. An extremely high rate of mortality was observed in Hungary in the mid-1990's.

Nedostaci studije

Potrebno je napomenuti nekoliko mogućih nedostataka ove studije. Strategije u kontroli kancera su vezane za epidemiološke podatke. Zato je kvalitet podataka u registrima karcinoma vrlo značajan. Potencijalni problemi u klasifikaciji karcinoma usne javljaju se zbog same lokalizacije promene [3]. Ovaj karcinom je tip oralnog karcinoma koji je lokalizovan na spoju usne šupljine i kože, što može dovesti do toga da bude dijagnostikovan kao karcinom kože [28]. Ipak, Svetska zdravstvena oragnizacija je kvalitet podataka koji se odnose na uzork smrti u Srbiji ocenila kao umeren [29]. Takođe, procenat nepoznatih i nedefinisanih uzroka smrti kod obolelih od karcinoma pokazuje da su podaci o uzrocima smrti u Srbiji umerenog kvaliteta [30]. Osim toga, GLOBOCAN 2012 je kategorisao podatke iz Srbije kao B2, što podrazumeva visoko kvalitetne regionalne podatke za stope incidencije i srednjeg kvaliteta podatke vezane za smrtnost.

Zaključak

Rezultati naše studije ukazuju da je profil karcinoma usne u centralnoj Srbiji stabilan i ima trend pada u ispitivanom periodu. Nakon 2011. godine, pokazuje se blagi trend porasta incidencije u ženskoj populaciji. Smrtnost od karcinoma usne u istom periodu prati trend incidencije. Na osnovu ovoga može se zaključiti da epidemiološka slika ovog karcinoma na ovoj teritoriji nije dramatična. Ali, GLOBOCAN predikcije ukazuju na porast incidencije ovog karcinoma usled porasta i starenja populacije. Pored toga, zemlje u razvoju su bile pogođene tranzicijom od zaraznih ka nezaraznim bolestima [31], što ukazuje na mogući trend rasta u narednom periodu. Stoga, visoka prevalencija faktora rizika, naročito pušenje i konzumiranje alkohola, ukazuju da postoji prostor za javnozdravstvene aktivnosti na nacionalnom nivou. Ove aktivnosti treba da budu usmerene na ekonomski efikasne mere u redukciji pušenja i smanjenju konzumiranja alkohola, kao i na uporno širenje svesti o rizicima preteranog izlaganja suncu.

Limitations of the study

Several possible limitations of this study should be considered. Strategies for cancer control are based on the epidemiology data. Therefore, the quality of cancer registers is crucial. The potential classification problem arises from the position of lip cancer [3]. This cancer is a form of oral cancer located at the junction between the oral cavity and the skin which could be misdiagnosed as skin cancer[28]. The quality of data related to the cause of death in Serbia was assessed as moderate by the World Health Organization[29]. The percentage of unknown and ill-defined cancer deaths for the most recent year indicated that cause-of-death data in Serbia were of moderate quality [30]. Furthermore, GLOBOCAN 2012 categorized data from Serbia as B2 which means high quality regional data (coverage between 10% and 50%) for the incidence rates and medium quality for complete vital registration for the mortality rates.

Conclusion

Pooled evidence implies that the profile of lip cancer in Central Serbia is stable and declines in the study period. After 2011, there are indications of a slight increase in female incidence. The mortality for the same period follows the pattern of incidence. Based on that, it can be concluded that the epidemiological picture of lip cancer is not dramatic. However, predictions for this cancer indicate its increase based on population growth and aging. Additionally, developing countries were affected by transition from infectious diseases to noncommunicable diseases [31], which implicates further possible increasing trend. Therefore, the high prevalence of risk factors, especially smoking habits, alcohol consumption, indicates that there is a place for public health activities at the national level. Those activities should be focused on cost-effective policies to reduce alcohol and tobacco use and persistent dissemination of information about the risks of sun over-exposure.

Zahvalnica

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ANALIZA EFIKASNOSTI ROPIVAKAINA SA DEKSAMETAZONOM U ORALNOJ HIRURGIJI

ANALYSIS OF EFFICACY OF ADDING DEXAMETHASONE TO ROPIVACAINE IN ORAL SURGERY

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Sažetak

Uvod: *Duža postoperativna anestezija postiže se upotrebom lokalnih anestetika dugog dejstva,kao što su ropivakain i bupivakain. U različitim hirurškim granama, duži bezbolni postoperativni period postiže se kombinacijom ropivakaina sa deksametazonom.*
Cilj *rada bio je utvrditi kakav efekat na dužinu trajanja lokalne anestezije ima kombinacija 0,75% ropivakaina sa dodatkom deksametazona u toku i posle oralnohirurških operacija.*
Materijal i metode: *Na Odeljenju oralne hirurgije Klinike za stomatologiju u Nišu, u toku 2017. godine, ispitivanjem je obuhvaćeno 12 pacijenata koji su podeljeni u 2 grupe: studijsku grupu od 6 pacijenata , koji su prilikom anestezije dobili 4 ml 0,75% rastvora ropivakaina i 1 ml deksazona od 4mg i kontrolnu grupu od 6 pacijenata koji su primili 4 ml 0, 75% rastvora ropivakaina. Statistička obrada podataka rađena je u programu SPSS 15.0.*
Rezultati:*Vreme pojave prvih znakova anestezije, utvrđenih testom senzitivne osetljivosti mekih tkiva (usne i gingive) u studijskoj grupi bilo je 1,5 min, a u kontrolnoj 2,66 min. Vreme nastupanja potpune anestezije tj. potpune neosetljivosti mekih tkiva u studijskoj grupi bilo je 3,5 min, a u kontrolnoj 4,66 min. Vreme za koje su pacijenti još uvek osećali dejstvo anestezije u studijskoj grupi iznosilo je 625, 5 min što ima i statističku značajnost (p < 0.01), dok je u kontrolnoj grupi taj period bio oko 290 min.*
Zaključak: *Male doze deksametazona dodatih lokalnom anestetiku mogu smanjiti potrebu za dodatnom anestezijom i analgetskom terapijom u prvia 24 sata posle teških oralno hirurških operacija.*

Ključne reči: *ropivakain, deksametazon, analgezija, anestezija*

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Abstract

Introduction*: Prolonged local anesthesia is achieved by using long-acting local anesthetics, as ropivacaine and bupivacaine. In different surgical branches, longer absence of pain is noted after surgical intervention when ropivacaine is used with dexamethasone than when it is used alone.*
The aim *of the study was to determine the effect on the duration of local anesthesia with a combination of 0.75% ropivacaine with the addition of dexamethasone during oral surgery interventions.*
Material and methods*: A total of 12 patients participated in the study which was conducted at the Department of Oral Surgery at The Dentistry Clinic in Niš, in 2017.Surgical interventions were performed on both upper and lower jaw. Patients were divided into 2 groups: the study group of 6 patients who received 4 ml of 0.75% ropivacaine solution with addition of 1 ml/4mg dexamethasone and the control group of 6 patients who received 4 ml of 0, 75% solution of ropivacaine without the addition of dexamethasone. Statistical data was processed by the SPSS 15.0 software.*
The results*: The onset time of first signs of anesthesia, confirmed by testing sensibility of soft tissues (lip and gingiva), was 1,5 min in the study group and 2.66 in the control group. The time necessary for the full effect of anesthesia to set in, i.e. total insensitivity of soft tissues, was 3.5 min in the study group and 4.66 min in the control group. The duration of local anesthesia was 625,5 min in the study group which is considered statistically significant (p < 0.01) and 290 min in the control group.*
Conclusion: *Small doses of dexamethasone added to local anesthetics may reduce the need for additional anesthesia and analgesic therapy within the first 24 hours after major oral surgery interventions.*

Key words: *ropivacaine, dexametasone, analgesia, anesthesia*

Uvod

Bol je „neprijatno senzorno ili emocionalno iskustvo koje je posledica stvarnog ili potencijalnog oštećenja tkiva“ [1] i predstavlja subjektivni osećaj koji se stvara u određenim delovima mozga kao odgovor na oštećenje tkiva u organizmu ili funkcionalne promene u samom mozgu[2]. Priroda i jačina bola su posledice senzornih događaja koji nastaju posle oštećenja tkiva i afektivno-kognitivnih mehanizama.

Lokalni anestetici su supstance koje privremeno blokiraju sprovođenje impulsa nervnim vlaknom i izazivaju reverzibilnu anesteziju tkiva koje ovo vlakno inerviše, dovodeći do blokade natrijumskih kanala i stabilizacije ćelijske membrane nervnog vlakna [3]. Ekenstam je 1957. godine sintetisao mepivakain i bupivakain, koji je kasnije postao najkorišćeniji lokalni anestetik dugog dejstva [4]. Iste godine, sintetisan je ropivakain, koji je u kliničku praksu uveden početkom devedesetih godina [5].

Od kada su objavljeni prvi izveštaji o upotrebi bupivakaina u oralnoj hirurgiji, ovaj anestetik se prevashodno koristio kod operacija da bi se obezbedila duža postoperativna anestezija. Međutim, studije ukazuju da dodatak adrenalina bupivakainu utiče na jače ispoljavanje njegove kardiotoksičnosti [6]. Intravaskularna ili intraosealna primena bupivakaina može dovesti do akutnog srčanog zastoja i smrti pacijenta [7,8]. Posle izveštaja o neželjenim efektima bupivakaina (kardiovaskularni kolaps, smrt posle slučajne intravenske primene), ropivakain je uveden u kliničku upotrebu u ginekologiji, ortopediji, urologiji, neurohirurgiji i drugim hirurškim granama za postizanje regionalne anestezije [9]. Prvi put u oralnoj hirurgiji kod nas upotrebljen je 2003. godine [10]. Ropivakain je lokalni anestetik dugog dejstva amidne grupe, hemijski je veoma sličan bupivakainu i mepivakainu. Jačina dejstva lokalne anestezije zavisi od primenjene koncentracije ropivakaina, 0,25%, 0,5% ili 0,75%. Prosečno vreme dužine lokalne anestezije posle primene ropivakaina iznosi između 4-5 sati [11-14].

Kod težih oralnohirurških operacija, gde je poželjno duže delovanje lokalne anestezije, javlja se potreba za dužim delovanjem lokalnog anestetika, koji će smanjiti potrebu za uzimanjem analgetika u postoperativnom periodu.

Introduction

Pain is “an unpleasant sensory or emotional experience that results from actual or potential tissue damage" [1] and represents a subjective feeling that occurs in certain parts of the brain as a response to tissue damage or functional changes in the brain itself [2]. The nature and severity of pain are the consequences of sensory events that occur after damage to tissues and affective-cognitive mechanisms.

Local anesthetics are substances that temporarily block impulse conduction by nerve fibers and cause reversible anesthesia of the tissues that these fibers innervate, leading to the blockage of sodium channels and stabilization of the cell membrane of the nerve fibers [3].

Ekenstam synthesized mepivacaine in 1957, as well as bupivacaine that later became the most used long-acting local anaesthetics[4]. Ropivacaine was synthesized the same year but had not been introduced into clinical practice before the early ‘90s [5].

Since the first reports on the use of bupivacaine in oral surgery were published, this anesthetic was primarily used in surgery to ensure prolonged postoperative anesthesia. However, studies show that adrenaline added to bupivacaine increases its cardiotoxicity [6]. Intervascular or interosseous administration of bupivacaine may lead to acute cardiac arrest and patient death [7,8]. After adverse effects of bupivacaine had been reported (cardiovascular collapse, death following accidental intravenous administration), ropivacaine was introduced into clinical use in gynecology, orthopedics, urology, neurosurgery and other surgical branches for achieving regional anesthesia[9]. It was used for an oral surgery intervention at our clinic for the first time in 2003 [10]. Ropivacaine is a long-acting local anesthetic of the amide group, chemically very similar to bupivacaine and mepivacaine. The efficacy of local anesthesia depends on the concentration of ropivacaine applied: 0.25%, 0.5% or 0.75%. The average duration of local anesthesia after the application of ropivacaine is between 4-5 hours [11-14]. Prolonged action of local anesthetics is particularly required after major oral surgeries as a way of reducing the use of analgesics in the postoperative period.

Smatra se da je uvođenje glukokortikoida u terapiju jedno od deset najznačajnijih otkrića u modernoj medicini [15]. Dexametazon se koristi prvenstveno zbog imunosupresivnog, antiinflamatornog i antialergijskog dejstva. Antiinflamatorni efekat je posledica dejstva na različite ćelije koje su uključene u inflamatorni proces, jer glukokortikoidi dovode do smanjenja broja T limfocita, smanjenja fagocitne aktivnosti makrofaga i oslobađanja medijatora inflamacije iz makrofaga i T-limfocita [16].

Brojne studije iz različitih hirurških grana upućuju na duži bezbolni period posle hirurške intervencije pri upotrebi ropivakaina sa deksametazonom nego samog ropivakaina [17-20]. U nama dostupnoj literaturi nema podataka o upotrebi kombinacije ropivakaina sa deksametazonom u oralnoj hirurgiji,

Cilj rada bio je da se utvrdi kakav efekat na dužinu trajanja lokalne anestezije ima kombinacija 0,75% ropivakaina sa dodatkom dexametazona u toku oralnohirurških operacija.

Materijal i metode

Kliničko ispitivanje dužine dejstva lokalne anestezije 0,75% rastvora ropivakaina u dozi od 4 ml (Ropivacaine Cabi, Phressenius, Greece) i 0,75% rastvora ropivakaina uz dodatak 1 ml /4mg dexametazona (Dexason, Galenika, Srbija) urađeno je u skladu sa etičkim principima Helsinške dekleracije o zaštiti pacijenata u anesteziji iz 2010. godine[21]. Na Odeljenju oralne hirurgije Klinike za stomatologiju u Nišu, u toku 2017. godine, ispitivanjem je obuhvaćeno 12 pacijenata ASA I[22] (zdravi pacijenti) i ASA II[22] klase (pacijenti sa diskretnim sistemskim promenama, deca, vrlo stare i gojazne osobe, pacijenti sa hroničnim bronhitisom), kod kojih je bila indikovana hirurška intervencija u gornjoj i donjoj vilici. Dijagnoza i indikacija za operativni zahvat postavljana je na osnovu kliničkog pregleda i radiografskog snimka (ortopantomograma). Svi pacijenti su bili zdravi, bez podataka o hroničnim ili akutnim oboljenjima i alergijama na lokalne anestetike.

Svi pacijenti su bili obavešteni o sastavu lokalnog anestetika koji će primiti i oni su dali pisanu saglasnost za učešće u istraživanju. Pacijenti su posle operacije poneli sa sobom pisani upitnik u koji su unosili podatke o dužini dejstva anestezije u

The introduction of glucocorticoids as a treatment is widely considered to be one of the ten most significant discoveries in modern medicine [15]. Dexamethasone is used primarily due to its immunosuppressive, anti-inflammatory and anti-allergic effects. The anti-inflammatory effect comes from its action on various cells involved in the inflammatory process which decreases the number of T lymphocytes, as well as the phagocytic activity of macrophages, and reduces the release of the inflammatory mediators from macrophages and T-lymphocytes [16].

Numerous studies from different surgical branches show longer absence of pain after surgical intervention when ropivacaine is used with dexamethasone than when it is used alone [17-20]. To the best of our knowledge, there is no available data about using ropivacaine with dexamethasone in oral surgery.

The aim of this study was to determine the effect of adding dexamethasone to 0.75% ropivacaine on the duration of local anesthesia.

Materials and methods

Clinical examination of the duration of the local anesthetic – 4ml of 0.75% ropivacaine solution (Ropivacaine Cabi, Phressenius, Greece) or 0.75% ropivacaine solution with the addition of 1 ml / 4 mg dexamethasone (Dexason, Galenika, Serbia) – was done in accordance with The Ethical Principles of The Helsinki Declaration on Patient Safety in Anesthesia 2010[21]. A total of 12 patients participated in the study which was conducted at the Department of Oral Surgery, Clinic of Dentistry Niš, in 2017. The patients belonged to ASA I[22] (healthy patients) and ASA II[22] group (patients with minor systemic changes, children, very old and obese patients, and patients with chronic bronchitis). Surgical interventions were performed on both the upper and lower jaw. The diagnosis and indication for oral surgery interventions was based on a clinical examination and a radiographic image (orthopantomogram). All patients were healthy, without any familiar history of chronic or acute illnesses and allergies to local anesthetics. All patients were informed about the components of the local anesthetic they were going to receive and they signed a written consent for participating in our research. Having undergone surgery, the patients were

prva 24 sata po operaciji kao i o količini unetih analgetika.

Pacijenti su podeljeni u dve grupe: studijsku grupu od 6 pacijenata, koji su prilikom anestezije dobili 4 ml 0,75% rastvora ropivakaina i 1 ml dexasona od 4 mg i kontrolnu grupu od 6 pacijenata koji su primili 4 ml 0,75% rastvora ropivakaina bez dodataka.

Rezultati su statistički obrađeni. Statistička obrada podataka rađena je u programu SPSS 15.0. Kontinualni parametri praćeni su Studentovim t-testom nezavisnih uzoraka.

Rezultati

Ukupno je 12 pacijenata oba pola uključeno u studiju. Prosečna starost ispitanika iznosila je 27,8 godina. Od ukupnog broja, pet (41,6 %) ispitanika bilo je muškog pola, a 7 ispitanica (58,4%) ženskog pola (tabela1). Najveći broj oralno-hirurških intervencija odnosio se na operativno vađenje donjeg impaktiranog umnjaka, ukupno sedam (58,3%) od 12 izvedenih hirurških zahvata. Vreme pojave prvih znakova anestezije utvrđenih testom senzitivne osetljivosti mekih tkiva (usne i gingive) u studijskoj grupi bilo 1,5 min, a u kontrolnoj 2,66 min.

given a written questionnaire about the duration of anesthesia in the first 24 hours, as well as the amount of analgesics they used in that period.

Patients were divided into two groups: the study group of 6 patients who received 4 ml of 0.75% ropivacaine solution with addition of 1 ml/4mg dexamethasone and the control group of 6 patients who received 4 ml of 0, 75% solution of ropivacaine without the addition of dexamethasone. Statistical data were processed by the SPSS 15.0 software. Continuous parameters were evaluated by a Student's t-test for Independent Samples.

Results

Out of 12 patients in total that were included in this study, 5(41.6%) patients were male and 7(58.45%) were female. The average age of patients was 27.8 years. Most of the oral surgery interventions performed were surgical removals of impacted wisdom tooth in the lower jaw - 7(58.3%) out of 12 oral surgery interventions in total.

The onset time of the first signs of anesthesia, confirmed by testing sensibility of soft tissues (lip and gingiva), was 1.5 min in the study group and 2.66 in the control group. The time necessary for the full effect of anesthesia to set in, i.e. total insensitivity of soft tissues, was 3.5 min in the study group and 4.66 min in the control group.

Tabela 1. Polna pripadnost i prosečna starost ispitanika po grupama
Table 1. Sex and the average age of patients

Pacijenti/ patients	**Pol/Sex** ♂	♀	**Prosečna starost pacijenata/ The average age of patients**
Studijska grupa/ Study group 0,75%ropivakaina/ropivacaine &4mg deksazona/dexametasone	3 (50%)	3 (50%)	23,5 god./years
Kontrolana grupa/Control group 0,75%ropivakaina/ropivacaine	2 (33,3%)	4 (66,7%)	32,1 god./years
Ukupno/Total	5 (41,6%)	7 (58,4%)	27,8. god./yeras

Tabela 2. Praćeni parametri dejstva lokalne anestezije
Table 2. Monitored parameters of local anesthesia

Vrsta operacije /The type of oral surgery intervention	Vrsta anestezije /The type of anesthesia	Količina anestetika /The dosage of local anesthesia (ml)	Vreme pojave prvih znakova anestezije /The onset time for the first signs of anesthesia	Vreme nastupanja potpune anestezije /The time necessary for the full effect of anesthesia	Dužinaanestezije /The duration of local anesthesia
REVISIO VULNERIS 36	Direktna za n.alv. inferior /Direct anaesthesia for n..alveolaris inferior	4ml Ropivakaina /Ropivacaine	5 minuta	7 min	300 min
EXTRACTIO CHIRURGICA 18	plexus	4 ml Ropivakaina /Ropivacaine	Odmah po aplikaciji Immediately	4 min	280 min
EXTRACTIO CHIRURGICA 48	Direktna za n.alv. inferior	4 ml ropivakaina /Ropivacaine	1 minut	4 min	390 min
EXTRACTIO CHIRURGICA 28	Direktna za n.alv. inferior	4 ml ropivacaina	2 min	4 min	120 min
EXTRACTIO CHIRURGICA 16	plexus	4 ml ropivakaina Ropivacaine	5 min	6 min	420 min
EXTRACTIO CHIRURGICA 18	plexus	4 ml ropivakaina ropivacaina	3 min	3 min	230 min
			Prosečno: The average: 2,66 min	***Prosečno: The average: 4,66 min***	***Prosečno: The average: 290 min***
EXTRACTIO CHIRURGICA 48	Direktna za n.alv. inferior Direct forn.alv. inferior	4ml ropivacaine+1 ml dexametasone	2 min	5 min	703 min
EXTRACTIO CHIRURGICA 38	Direktna za n.alv. inferior Direct for n.alveolaris inferior	4ml ropivacaine+1 ml dexametasone	1 min	3 min	748
EXTRACTIO CHIRURGICA 38	Direktna za n.alv. inferior Direct for n.alveolaris inferior	4ml ropivacaine+1 ml dexametasone	Odmah po aplikaciji Immediately	Odmah po aplikaciji Immediately	624 min
REVISIO VULNERIS 48	Direktna za n.alveolaris inferior	4ml ropivacaine+1 ml dexametasone	3 minuta	8 min	292 min
EXTRACTIO CHIRURGICA 48	Direktna za n.alv. inferior Direct for n.alveolaris inferior	4ml ropivacaine+1 ml dexametasone	2 min	3 min	460 min
EXTRACTIO CHIRURGICA 38	Direktna za n.alv. inferior Direct for n.alveolaris inferior	4ml ropivacaine+1 ml dexametasone	1 min	2 min	926 min
			Prosečno: The average: 1,5 min	***Prosečno: The average: 3,5 min***	***Prosečno: The average: 625,5 min***

Vreme nastupanja potpune anestezije, tj. potpune neosetljivosti mekih tkiva, u studijskoj grupi bilo je 3,5 min, a u kontrolnoj 4,66 min.Vreme za koje su pacijenti još uvek osećali dejstvo anestezije (odgovarali su da su imali osećaj trnjenja, potpune ili delimične neosetljivosti) u studijskoj grupi je iznosilo 625,5 min, dok je u kontrolnoj grupi taj period bio više nego dvostruko manji, oko 290 min (tabela 2).Trajanje anestezije statistički je značajno duže u studijskoj grupi pacijenata kod kojih su korišćeni i ropivakain 4 ml i Dexason 4 mg/1ml ($p < 0,01$). Osim jednog pacijenta koje je preventivno uzeo jednu tabletu ibuprufena odmah posle intervencije, nije bilo pacijenata koji su koristili analgetike u prva 24h posle operacije.

Diskusija

Primenjena kombinacija 4 ml ropivakaina 0,75% sa deksametazonom 4 mg/1ml dovela je do uspešne perioperativne i postoperativne anestezije mekih i koštanih tkiva kod težih oralnohirurških operacija. U studijskoj grupi kod koje smo kao lokalnu anesteziju u istoj brizgalici dali ropivakain i deksametazon postoperativna anestezija trajala je više nego dvostruko duže, 625,5 min, tj 10,4 časova, dok je u kontrolnoj grupi posle primene ropivakaina bez deksazona anestezija trajala 290 min, ti. 4.8 sati. Dexametason se nalazi na listi najefikasnijih i najpotrebnijih lekova zadravstvenog sistema bazičnih lekova Svetske zdravstvene organizacije[23]. Deksametazon ima uticaj na produženu nervnu blokadu, jer sprečava nociceptivni prenos impulsa duž mijeliniziranog C vlakna[24,25] i deluje lokalno na nervno vlakno ako je primenjen perineuralno[26]. Vrlo često se kombinacija različitih razmera ropivakaina i deksametazona (10,18,25 ml ropivakaina i 4,8,10 mg deksametazona) koristi za blokadu brahijalnog plexusa i u hirurgiji ramenog zgloba[27-29], hirurgiji zgloba kolena[30], histerektomiji[31], za epiduralnu anesteziju[32] . Mi smo upotrebili 4 ml ropivakaina u koncentraciji od 0,75% i dexametasona 1 ml/4mg, što je znatno manje od razmera koje su drugi autori upotrebljavali, i postigli smo dvostruko duži period anestezije.

I bupivakain je kombinovan sa deksametazonom, pri čemu je postoperativni bezbolni period trajao i do tri puta duže nego bez njega[33].Interesantna je činjenica da se i.v. primena iste doze deksametazona nije pokazala tako efikasnom u smanjenju postoperativnog bola kao perineuralna primena[20,34].

The duration of local anesthesia, as measured by patients and described by numbness, partial or total insensitivity of lip, tongue or gingiva, was 625.5 min in the study group and 290 min in the control group (Table 2). The duration of anesthesia in the group that received a combination of 4 ml 0.75% ropivacaine and dexamethasone, 4mg/1ml ($p < 0.01$), was more than twice as long as that in the group that received only ropivacaine, which is considered statistically significant. Except for one patient who took a tablet of ibuprofen right after the intervention preventively, no other patients took analgesics in the first 24 hours postoperatively.

Discussion

A combination of 4ml 0.75% ropivacaine with 4mg/1ml dexamethasone resulted in successful perioperative and postoperative anesthesia of soft and bone tissues after major oral surgery interventions. In the study group, which received 4ml ropivacaine 0.75% with 4mg/1ml dexamethasone - administered in a single syringe, perioperative anesthesia lasted 625. 5 min, i.e 10.4 hours, while in the control group, which only received ropivacaine 0.75% it lasted 290 min, or 4.8 hours.

Dexamethasone is on the World Health Organization List of the Essential and Most Efficient Medicines in the Basic Health Care System [23]. It has an effect on the prolonged nerve block because it prevents the nociceptive transmission of the pulse along the myelinized C fiber [24,25] and acts locally on the nerve fiber, when applied perineurally [26]. Very often, a combination of different dosage of ropivacaine and dexamethasone (10 , 18, 25 ml ropivacaine and 4, 8 10 mg dexamethasone) is used to block the brachial plexus in shoulder surgery [27-29], knee joint surgery [30], hysterectomy [31] and for epidural anaesthesia [32]. The concentration used in this study, 4ml ropivacaine at a concentration of 0.75% and 1ml / 4mg of dexamethasone, which is considerably smaller than the dosage used by other authors, resulted in twice as long period of anesthesia.

Bupivacaine has also been combined with dexamethasone in some studies with the postoperative pain-free period lasting up to three times as long as without dexamethasone [33].

An interesting fact is that i.v administration of the same dose of dexamethasone has proven to be not as effective in

Neki autori navode da je dužina postoperativne analgezije dozno zavisna od koncentracije deksametazona [35], dok su drugi došli do suprotnih rezultata [36]. Postoje podaci da kombinacija glukokortikida u istoj brizgalici može dovesti do kristalizacije tečnosti i potencijalne embolije organa, a primenjena perineuralno može imati neurotoksični efekat [37]. Dexametazon i ropivakain u istoj brizgalici nisu doveli do kristalizacije rastvora, odnosno vidljivog zamućenja tečnosti. Posle primene ove kombinacije, postoperativni tok u svim slučajevima prošao je bez simptoma neurotoksičnog delovanja primenjenog rastvora ili negativnog sistemskog dejstva.

Uzevši u obzir činjenicu da u dostupnoj literaturi nema podataka o perineuralnoj primeni kombinacije ropivakaina (u predelu n. alveolaris inferior i rr. alveolares superiors posteriores) i deksametazona u oralnoj hirurgiji, kao i da smo u studiji upotrebili manje doze ove kombinacije od 4 ml 0,75% anestetika i 1 ml/4 mg deksametazona, nego one koje su navedene u literaturi, naši rezultati pokazuju da je ova kombinacija jednako uspešna za postizanje perioperativne i postoperativne anestezije kao i u drugim hirurškim granama[38-39].

Zaključak

Kod oralnohiururških operacija kod kojih se očekuje pojava bolova posle intervencije, kombinacija 4 ml ropivakaina od 0,75% i 1ml deksametazona od 4mg/ml, obezbedila je dvostruko duži bezbolni postoperativni period (625,5 min) nego ropivakain bez dodatka deksametasona (290 min). Uočili smo da male doze deksametazona dodatih lokalnom anestetiku mogu smanjiti potrebu za dodatnom anestezijom i analgetskom terapijom u prva 24 sata posle teških oralnohirurških operacija.

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reducing postoperative pain as when applied perineurally [20,34].

Certain authors state that the duration of postoperative analgesia is dose dependent on the concentration of dexamethasone [35], while others report contrasting results [36].

Some data suggest that combining glucocorticoids in the same syringe can lead to crystallization of liquids and potential organ embolism, while perineural administration can have a neurotoxic effect [37].

In this study, dexamethasone and ropivacaine, administered in the same syringe, did not lead to the crystallization of the solution, or visible fluid clouding. The postoperative period with the combination used went without any symptoms of the neurotoxic effect or any negative systemic effects in all cases.

Considering the fact that there is no available information in the literature about perineural application (n.alveolaris inferior and rr.alveolares superiors posteriores) of ropivacaine in combination with dexamethasone in oral surgery, and that the combination dosage used in the study (4ml 0.75 % anesthesia and 1ml / 4mg Dexamethasone) was lower than the combination listed in the existing literature, our results show that this combination is equally successful in achieving perioperative and postoperative anesthesia in oral surgery as in other surgical branches[38-39].

Conclusion

In oral surgery interventions where pain is expected after the intervention, a combination of 4 ml of ropivacaine 0.75% and 1 ml of dexamethasone 4 mg / ml, results in twice as long postoperative anesthesia (625.5 min) compared to ropivacaine only (290 min). It was noted that small doses of dexamethasone added to local anesthetics may reduce the need for additional anesthesia and analgesic therapy within the first 24 hours after major oral surgery interventions.

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LASER ANALGEZIJA U TOKU ORTODONTSKE TERAPIJE

LASER ANALGESIC DURING ORTHODONTIC THERAPY

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Sažetak

Uvod*: Posebno je važno smanjiti bol nakon prvog postavljanja luka. Većina pacijenata oseća bol četiri sata nakon što se luk postavi , postiže najviši nivo nakon 24 sata i smanjuje se u narednih nekoliko dana. Podaci iz literature pokazuju da je strah od bola veoma važan razlog za obeshrabrivanje pacijenata da prihvate ovakav ortodontski tretman.*
Cilj *ove studije bio je da se proceni efikasnost biostimulativnog laserskog tretmana u smanjenju bolova kod pacijenata sa fiksnim ortodontskim aparatima.*
Materijal i metode*:Petnaest pacijenata je tretirano biostimulativnim diodnim laserom, tokom dva minuta po kvadrantu, odmah nakon postavljanja fiksnih ortodontskih aparata i u naredna četiri dana. Kontrolna grupa od 15 pacijenata dobila je analgetsku terapiju u trajanju, od pet dana. Bol je subjektivno ocenjen kao jak, srednji ili bez bolova. Bol je nestao kod 20% ispitanika u ispitivanoj grupi nakon prvog dana, dok je kod 60% i 26,6% ispitanika srednja i izolovana bol bila prisutna drugog i trećeg dana. Bol je nestao kod svih pacijenata tretiranih laserom petog dana. Jak bol bio je prisutan kod svih ispitanika u kontrolnoj grupi prvog dana,dok je drugog dana smanjen na 60%, a 20% ispitanika sa srednjim intenzitetom bola. Nakon tri dana, kontrolna grupa je pokazala srednji lokalizovan bol u 40% slučajeva, koji se smanjio kod 26,6% nakon četvrtog dana, što ukazuje na kasnije smanjenje bola u odnosu na grupu koja se tretira laserom.*
Rezultati *ukazuju na to da se primena lasera sa niskom energijom može uspešno koristiti za smanjenje bolova tokom početnog nelagodnog perioda nakon postavljanja fiksnih ortodontskih aparata.*
Zaključak: *Niskoenergetski laseri mogu uspešno da smanje bol u početnom periodu posle postavljanja fiksnog ortodontskog aparata.*

Ključne reči*: terapija niskoenergetskim laserom, analgetici, bol, fiksni ortodontski aparati*

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Abstract

Introduction:*Most of the patients feel pain 4 hours after the arch applying, gaining the highest level after 24 hours and its lowering in the next few days. Literature reports show that the fear of pain is a very important reason for discouraging the patient to agree for this kind of orthodontic treatment*
The aim *of this study was to evaluate the effectiveness of the biostimulative laser treatment in pain reduction in patients with fixed orthodontic appliances.*
Materials and methods*. Fifteen patients were treated with low energy level biostimulative diode laser, used 2 minutes per quadrant immediately after placement of fixed orthodontic appliances and in the following four days.The control group of 15 patients received analgesic therapy for period of five days. The pain was assessed subjectively as strong, medium or no pain. The pain disappeared in 20% of the subjects in the examined group after the first day, while in 60% and 26.6% of the subjects medium and isolated pain was still present at day 2 and 3, respectively.*
Results*.The pain disappeared in all the patients treated with laser at day 5. In the control group, strong pain was present in all the subjects the first day, decreasing to 60% of strong pain and 20% medium pain the second day. After day three, the control group demonstrated medium localized pain in 40% of the cases, which dropped to 26.6% after the fourth day, suggesting delayed pain reduction, compared to the laser treated group.*
Conclusion.*Our results suggest that the low energy laser treatment can successfully be used for pain reduction during the initial discomfort period after placing fixed orthodontic appliances.*

Key words: *low level laser treatment, analgesics, pain, fixed orthodontic appliances*

Uvod

Primena fiksnih ortodontskih aparata obično je razlog za pojavu neugodnosti i bola različitog stepena, koji mogu igrati ključnu ulogu ne samo za saradnju sa pacijentom, već i za uspeh lečenja [1,2,3]. Podaci iz literature pokazuju da je strah od bola veoma važan razlog za obeshrabrivanje pacijenata da prihvate ovakav ortodontski tretman[4]. Posebno je važno smanjiti bol nakon prvog postavljanja luka. Većina pacijenata oseća bol četiri sata nakon što se luk postavi, postiže najviši nivo nakon 24 sata i smanjuje se u narednih nekoliko dana [5].

Za terapiju bola ortodontskog porekla preporučuje se nekoliko različitih metoda: upotreba nesteroidnih antiinflamatornih lekova (NSAID), anestetičkih gelova, splinta, niskoenergetske laser terapije (LLLT), transkutane električne stimulacije nerva (TENS) i vibracione stimulacije [6]. Konvencionalni terapeutski pristup u rešavanju ovog problema tokom fiksne ortodontske terapije je orijentisan ka upotrebi lekova koji imaju dominantno analgetičke i antiinflamatorne efekte, ali u isto vreme, inicijalni ortodontski luk treba da proizvede ograničenu snagu [7]. U velikom broju radova suočeni su stavovi o efikasnosti i neophodnosti NSAID-a tokom ortodontskog lečenja [8,9,10]. Uzimajući u obzir negativne efekte analgetika, neki istraživači traže sigurne alternativne metode za smanjenje bolova, kao što je LLLT [11].

Postoji niz izvještaja o širokom spektru bioloških efekata lasera , uključujući analgetički efekat (koji nastaje zbog promena potencijala ćelijske membrane), aktiviranje mikrocirkulacije i ubrzani metabolizam, imunostimulacija, stimulacija epitelizacije, kao i antiinflamatorni efekat [12-17].

Neka istraživanja potvrđuju pozitivne efekte u suočavanju s takvom vrstom bola [18,19], dok neka ne [20].

Cilj ove studije bio je da se proceni efikasnost biostimulativne laserske terapije u lečenju bola kod pacijenata sa fiksnim ortodontskim aparatima.

Introduction

Applying fixed orthodontic appliances usually is a reason for some level of discomfort and pain, which can play a key role not only for the cooperation with the patient but for the treatment success as well[1, 2, 3]. Literature reports show that the fear of pain is a very important reason for discouraging the patient from this kind of orthodontic treatment [4]. Reducing the pain after the initial application of the arch is especially important. Most of the patients feel pain [4] hours after the arch application, gaining the highest level after 24 hours, which decreases in the next few days[5].

For managing the pain of orthodontic origin, several different methods are recommended: the use of nonsteroidal anti-inflammatory drugs (NSAIDs), anesthetic gels, splints, low level laser therapy (LLLT), transcutaneous electrical nerve stimulation (TENS) and vibrational stimulation [6]. The conventional therapeutic approach in dealing with this problem during the fixed orthodontic therapy is oriented towards the usage of medicaments which dominantly have analgesic and anti-inflammatory effects, but at the same time the initial arch should produce a limited force [7]. Most of the reports have confronted views for the efficiency and the necessity of NSAIDs use during the orthodontic treatment[8, 9,10]. Taking into consideration the negative effects of the analgesics, some researchers are seeking for safe alternative methods in reducing the pain, such as the LLLT[11]. There is a number of reports regarding the wide spectrum of biological effects of the laser, including the analgesic effect (due to changes in the cell membrane potential), activating the microcirculation and higher metabolism, immunostimulation, stimulation of the epithelization, as well as the antiinflammatory effect [12-17]. Some reports approve the positive effects in dealing with this kind of pain [18, 19], while some do not [20].

The aim of this study was to evaluate the effectiveness of the biostimulative laser therapy in the treatment of pain in patients with fixed orthodontic appliances.

Materijal i metode

Na Klinici za oralnu patologiju i parodontologiju u Skoplju pregledano je ukupno 30 pacijenata sa fiksnim aparatima, odmah nakon postavljanja ortodontskog luka. Kod 15 pacijenata koji su činili ispitivanu grupu, laser terapija je obavljena odmah nakon postavljanja ortodontskog aparata i u naredna četiri dana Korišćen je laserski uređaj Scorpion D-405 7A®, sa talasnom dužinom od 630-670 nm, sa 20 mV i intenzitetom od 220 mW/cm^2.

Vreme lasiranja je trajalo dva minuta po polju, vestibularno ili oralno po vilici, koristeći optički produžetak sa uglom od 30°. Pacijenti iz kontrolne grupe (n = 15) primali su analgetičku terapiju sa dnevnom dozom od 0,5 g metamizol-natrijuma (Analgin®). Bol je svakodnevno evaluiran i subjektivno ocenjen kao potpuno odsustvo bola, umereni i snažni bol. Rezultati su statistički analizirani i grafički prikazani.

Rezultati

Dinamika bolova u kontrolnoj grupi tokom petodnevnog perioda prikazana je na grafikonu 1. Prvog dana, jak bol je potvrđen kod 100% pacijenata, koji se zadržao drugog dana kod 60%, dok je umeren bol bio dominantan subjektivni osećaj kod 40% pacijenata trećeg dana, da bi se četvrtog dana smanjio na 26,6%. Nijedan od pacijenata nije imao bol petog dana studije. Grafikon 2 prikazuje distribuciju bolova u ispitivanoj grupi. Bol je bio odsutan kod 20% ^{3} pacijenata prvog dana, dok je umereni i izolovani bol bio prisutan kod 60% i 20% pacijenata tokom drugog i trećeg dana.

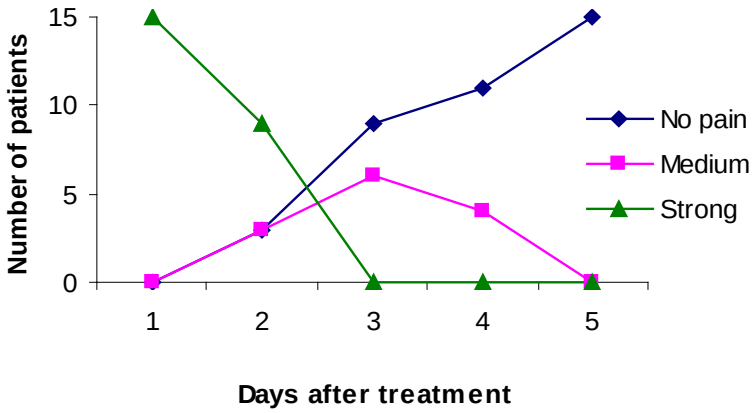
Tokom četvrtog i petog dana bol nije zabeležen ni kod jednog pacijenta tretiranog laserom. Poređenje podataka o ukupnom odsustvu bolova (grafikon 3) pokazuje da je niskointenzivna laserska terapija pokazala terapijski efekat odmah nakon prve posete i bila je razlog potpunog obezboljavanja kod 20% pacijenata, u poređenju sa analgetičkom terapijom koja nije imala efekta u ovom vremenu. Ovaj trend značajnog analgetičkog laserskog efekta nastavljen je tokom čitavog terapijskog perioda, što je dovelo do potpunog odsustva bolova kod svih pacijenata u ispitivanoj grupi četvrtog dana, u poređenju sa kontrolnom grupom, u kojoj je bol prisutan kod 11 (73,3%) pacijenata.

Material and methods

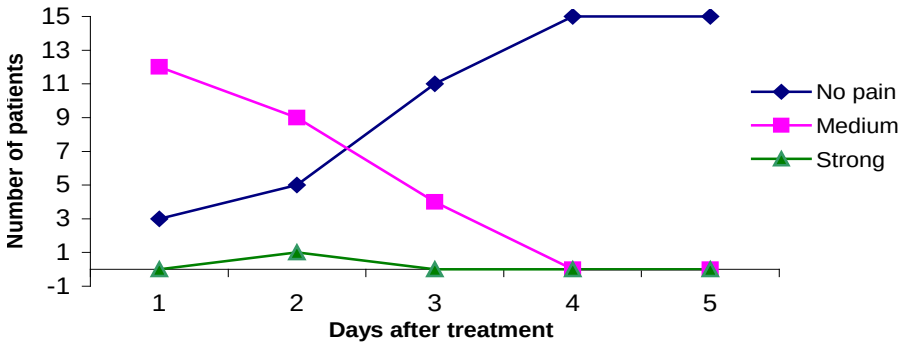
A total of 30 patients with fixed appliances were evaluated in the Clinic for Oral Pathology and Periodontology in Skopje immediately after the arch placing. In 15 patients representing the examined group, laser treatment was performed right after the setting of the orthodontic appliance, including the following 4 days as well. Scorpion D-405 7A® laser device was used, with wavelength of 630-670 nm, output of 20 mW, and intensity of 220 mW/cm^2. The duration of each treatment was 2 minutes per area, with one area representing a buccal or oral side in one jaw quadrant and optical attachments with angle of 30° were used. The patients from the control group (n=15) received analgesic treatment with daily administration of 0.5 g metamizol sodium (Analgin®). Pain was evaluated daily and assessed subjectively as total absence of pain, moderate and strong pain. The results were statistically analyzed and graphically presented.

Results

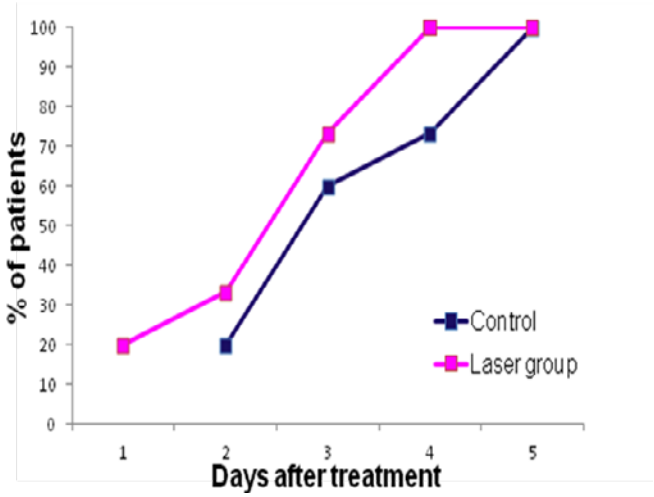
Dynamics of pain in the control group during the 5-day period is shown in Graph 1. On the first day, strong pain was verified in 100% of patients, which persisted during the second day in 60%, while moderate pain was a dominant subjective feeling in 40% of the patients on the third day, which lowered to 26,6% on the fourth day. None of the patients experienced pain on the fifth day of the study. Graph 2 shows the pain distribution in the examined group. The pain was absent in 20% (3) of patients on the first day, while moderate and isolated pain was present in 60% and 20% of the patients during the second and third day, respectively. During the fourth and fifth day, pain was detected in none of the patients treated with laser. Comparison between data for the total absence of pain (Graph 3) shows that the low level laser therapy demonstrated a therapeutic effect immediately after the first visit and was a reason for the total relief of pain in 20% of the patients, compared to the analgesic therapy which did not have effect during this period. This trend of notable analgesic effect of the laser continued during the entire therapeutic period, which led to the total absence of pain in all of the patients from the examined group on the fourth day, compared to the control group in which pain was present in 11 (73,3%) of the patients.



Grafikon 1. Smanjenje bola u kontrolnoj grupi
Graph 1. Pain reduction in the control group



Grafikon 2. Smanjenje bola u grupi koja se tretira laserom
Graph 2. Pain reduction in the laser-treated group



Grafikon 3. Potpuno smanjenje bola u obe grupe
Graph 3. Complete pain reduction in both group

Diskusija

Loša estetika, nelagodnost i bol koji se javlja usled pomeranja zuba nakon primene ortodontskih sila u fiksnoj tehnici dominantni su faktori u prihvatanju i prilagođavanju ovoj vrsti terapije.

Podaci u literaturi ukazuju na protivrečnost u procentu pacijenata koji se žale na pojavu i trajanje bolova nakon primene fiksnog ortodontskog aparata. U nekim radovima su evidentirane dnevne varijacije bolova sa najvišim nivoom bola u večernjim i noćnim satima. Obično bol traje 2-3 dana i postepeno se smanjuje nakon 5 do 6 dana [5,6].

Rezultati ove studije, takođe, pokazali su značajno prisustvo bola prvog dana kod svih ispitanika u kontrolnoj grupi i umeren bol kod 80% pacijenata u ispitivanoj grupi, kao i trend njegovog postepenog smanjenja tokom sledećih dana.

Najverovatnije je da je bol uzrokovan akutnom inflamatornom reakcijom kao rezultat ne samo primene fiksnog ortodontskog aparata, već i zbog pokretanja zuba. Otok i povećani pritisak tkiva su drugi mehanički faktor u razvoju bola.

Brojni medijatori (serotonin, bradikinin, PGE) takođe su uključeni u mehanizam pojave bola, putem povećanja lokalne vazodilatacije i kapilarne propustljivosti, promenom senzitivnosti i receptivnosti receptora u određenoj oblasti. Ovim putem, granični prag postaje veoma nizak, tako da nociceptori postaju mnogo osetljiviji na stimulus, baš kao i mehanoreceptori. Za analgeziju, većina ortodonata propisuje NSAIL koji sprečava proizvodnju prostaglandina.

Njegovo propisivanje u malim dozama prvog ili drugog dana tokom početne faze ortodontske terapije ne utiče značajno na proces pomeranja zuba. Ipak, većina ovih lekova ima neželjene efekte na pomeranje zuba ako se koristi u dužem vremenskom periodu (zbog efekta inhibicije prostaglandina) [21].

Ne treba zanemarivati sistemske neželjene efekte [22-24]. Postoji mnogo izveštaja o korišćenju ovih analgetika u ortodontskoj praksi; kao i određeni stav za njihovo korišćenje kao lek izbora, bez obzira na vrstu (ibuprofen, acetaminophen ili aspirin), zbog nedostatka dokaza za efikasnost laserske terapije i drugih nefarmakoloških modaliteta [11].

Discussion

Bad aesthetics, discomfort and pain which occur due to tooth movements after the application of orthodontics forces with the fixed technique are the dominant factors in accepting and adapting to this type of therapy.

Literature data indicates inconsistency in the percent of patients who refer to the occurrence and lasting of the pain after applying a fixed orthodontic appliance. Daily pain variations with the highest level of pain in the evening and night hours have been previously reported. Usually, pain lasts for 2-3 days and gradually lowers after 5 to 6 days [5,6].

The results in our study also showed a notable presence of pain on the first day in all the examinees in the control group and moderate pain in 80% of the patients in the examined group, as well as a decreasing trend in the next following days. It is most likely that pain is due to the acute inflammatory reaction as a result not only of the application of the fixed orthodontic appliance but because of the initial tooth movement as well. The swelling and increased tissue pressure are other mechanical factors in the development of pain. A number of mediators (serotonin, bradykinin, PGE) are also involved in the mechanism of pain occurrence by increasing the local vasodilatation and capillary permeability and by altering the sensitivity and receptivity of the receptors in the specific area. In this way, the pain threshold becomes very low that the nociceptors are much more sensitive to the stimulus, just like the mechanoreceptors. For pain relief, most of the orthodontists prescribe NSAIDs, which inhibit the prostaglandin production. Their administration in low doses on the first or second day of the initial phase would not considerably affect the process of tooth movement. Nevertheless, most of these medicaments have side effects on the teeth movement if used in a long period of time (due to the inhibition effect to the prostaglandins) [21].

The systemic side effects should not be neglected as well [22-24]. There are lots of reports for using these analgesics in orthodontic practice; there is a view-point for their usage as a first choice medicament, regardless of the type (ibuprofen, acetaminophen or aspirin) because of the lack of evidence for the efficiency of the laser therapy and other non-pharmacological modalities [11].

U ovom radu, ispitanicima iz kontrolne grupe preporučeno je da uzmu Analgin (0,5 g metamizol natrijuma), što je bio razlog za odsustvo jakih bolova nakon trećeg dana, ali je potpuno odsustvo zabeleženo nakon petog dana (Grafikon 1).

Ovo je u skladu sa izveštajima koji podržavaju efikasnost analgetičke terapije [10,21,25]. Pregled literature pokazuje da su najprepisivaniji analgetici NSAID, dok nema izveštaja o upotrebi lekova metamizola tokom ortodontskog tretmana. Metamizol spada u grupu neopioidnih analgetika.

Mehanizam njegovog delovanja još uvek nije dobro razjašnjen, ali smatra se da on i njegov metabolit (4-N-metilaminoantipirin) inhibiraju bol putem delovanja na prostaglandine, pa je verovatno to razlog njegovog sličnog efekta sa jednim od NSAID preparata. Smatramo da je sličnost u mehanizmu delovanja Analgina sa NSAID preparatima razlog za rezultate koji dokazuju njegov analgetički efekat u ovoj studiji.

Analgetički efekti niskoenergetskog laserskog svetla koristi se u različitim kliničkim stanjima. Laserska analgezija je terapeutski modalitet koji koristi neinvazivni način, jednostavnu primenu i odsustvo negativnih tkivnih odgovora. Stoga vredi proceniti njegov potencijal za primenu u ortodonciji.

Dominantno pozitivna i verifikovana iskustva u smanjenju bolova prilikom fiksnog ortodontskog tretmana govore ne samo o anti-inflamatornom i analgetičkom efektu laserskog svetla, već i o bržem pomeranju zuba i remodeliranju alveolarne kosti, što smanjuje neugodnost i bol u početnoj fazi fiksnog ortodontskog tretmana i smanjivanju vremena tretmana.

Izuzetni klinički analgetički efekti lasera tokom inicijalnog pokretanja zuba u fiksnom ortodontskom tretmanu [1,19] su snažan razlog da klinička primena preovladava u odnosu na trend otkrivanja njegovih bioloških mehanizama. Mehanizam analgezije laserskom terapijom je rezultat direktnog dejstva lasera na nervna vlakna, tako što stabilizuje njihov depolarizacijski potencijal, ali i efekat na ćelijske i biohemijske procese tokom inflamatornog odgovora [20,27].

Budući da nismo imali neposredni analgetički efekat koji se je pojavio 24-48 sati nakon primene lasera (grafikon 2), rezultati u ovoj studiji podržavaju hipotezu da je analgezija postignuta uglavnom zbog efekta lasera na inflamaciju. LLLT može imati pozitivan efekat kod ortodontskih pacijenata ne samo odmah nakon postavljanja inicijalnog ortodontskog luka, već u sprečavanju i lečenju bolova prilikom menjanja luka, korišćenja separatora itd.

In our study, the examinees from the control group were recommended to take Analgin (0,5 g metamizol sodium), which was the reason for the absence of strong pain after the third day, but the total absence was noted after the fifth day (Graph 1).

This is in accordance with the reports which support the efficiency of the analgesic therapy[10, 21, 25]. Literature review showed that the most prescribed analgesics are NSAIDs, while there are no reports for the usage of metamizole medicaments during the orthodontic treatment. Metamizole belongs to the group of non-opioid analgesics. The mechanism of its action is still not well elucidated, but it is thought that it and its metabolite (4-N-Methylaminoantipyrin) inhibit the pain through their effect on prostaglandins, so it is likely that this is the reason for its similar effect on the one of the NSAIDs. In our opinion, the similarity in the mechanism of action of the Analgin with the NSAIDs is the reason for the results which prove its analgesic effect in this study.

The analgesic effects of the low level laser light are used in different clinical conditions. Laser analgesia is a therapeutic modality the benefit of which is a non-invasive manner, easy application and absence of negative tissue responses. Thus, it is worth to review its potential for application in orthodontics. The dominantly positive and verified experiences in minimizing the pain during fixed orthodontic treatment demonstrate not only the anti-inflammatory and analgesic effect of the laser light but also a quicker tooth movement and alveolar bone remodeling, which minimizes the discomfort and pain in the initial phase of fixed orthodontic treatment and reduce the treatment time. The extraordinary clinical effects of the laser for pain relief during the initial tooth movement in the fixed orthodontic treatment [1, 19] are strong reasons for the clinical application to overcome the trend for elucidation of its biological mechanisms.

The mechanism of analgesia of the laser therapy is due to the direct effect of the laser on the nerve fibers, in the way that it stabilizes their depolarization potential, but also of the effects on the cell and biochemical processes during the inflammatory response [20,27]. Because the immediate analgesic effect was not noted, but it was demonstrated 24-48 hours after the application (Graph 2), the results in this study support the hypothesis that the analgesics is mainly due to the laser effect on the inflammatory process.

Turhani i sar.[1] su pokazali da lasersko zračenje u jednoj sesiji odmah nakon postavljanja aparata smanjuje bol nakon 6 i 30 sati, što nije u skladu sa našim rezultatima. Tortamano i sar[19]. zaključuju da su laseri (GaAlAs, 830 nm, izlazna energija 30 mV) efikasni odmah nakon postavljanja luka, jer su pacijenti prijavili niži bol i intenzitet bolova tokom najbolnijeg dana. Tokom laserskog tretmana, bol se brže smanjivala.

Procena uticaja LLLT na bol u ortodontskom tretmanu u studijama [26,27] pokazala je da je intenzitet bolova u laserskoj grupi na nižem nivou, ali nije statistički značajan u odnosu na kontrolnu grupu. Won Tae Kim i sar.[28] su izvestili da efekat laserske terapije nije superioran, ali smanjuje pik bola, u poređenju sa grupama sa placebom i analgetikom. U drugoj studiji [29] utvrđene su značajne razlike između LLLT-a i placebo grupa, pri čemu LLLT grupa pokazuje niže prosečne vrednosti nivoa boli u čitavom vremenskom periodu.

Suprotno, Esper i sar.[20] obaveštavaju da nema značajnog smanjenja bola u laserskoj grupi u poređenju sa placebo grupom. Nedoslednost u ovim izveštajima je posledica modaliteta njegovog načina primenjivanja, kao što je jedna sesija [1,19, 30] ili terapija sa više sesija tokom nekoliko dana [18,26], što može biti razlog za različitu efikasnost laserske terapije.

Smatra se da češće lasersko zračenje u periodu nelagodnosti ili bola može dovesti do značajnog smanjenja percepcije bola kod pacijenata. Nakon terapije laserom, u ispitivanoj grupi uočeno je smanjenje bola u drugoj poseti, sa potpunim odsustvom bolova kod tri pacijenta (20%) (grafikon 2), što je u skladu sa rezultatima nekih autora [27,29], koji takođe potvrđuju značajno smanjenje bolova kod pacijenata tretiranih laserom.

Činjenica da laser uzrokuje brzo oslobađanje bola nakon prve terapije i potpuno smanjenje bola posle četvrtog dana, u poređenju sa kontrolnom grupom gde se jak bol gubi posle trećeg dana kod 60% i potpuno odsustvo bolova nakon petog dana, još jedan je dokaz analgetičkog laserskog efekta (grafikon 1). Uzimajući u obzir ove nalaze, kao i to da je PGE2 jedan od najvažnijih hemijskih medijatora u akutnoj fazi upale, ali je takođe faktor odgovoran za pojavu bola, možemo pretpostaviti povezanost između laserski indukovane inhibicije PGE2 i blokade ciklooksigenaze sa smanjenjem bola [31] i u ovom kontekstu tumačimo rezultate.

Biomikroskopska istraživanja i stanje parodonta pokazuju da gingivalna cirkulacija postaje normalna nakon terapije laserom, dok se kapilarna propustljivost i venska kongestija smanjuju, što dovodi do brže korekcije upale i smanjenja bolova [32].

LLLT may have a positive effect in orthodontic patients not only immediately after applying the initial arch, but generally in preventing and treating the pain during the treatment - changing of arch, use of separators etc. Turhani et al. [1] showed that laser irradiation in one session immediately after setting the appliance reduces the pain after 6 and 30 hours, which is not in accordance with our results. Tortamano et al. [19] concluded that lasers (GaAlAs, 830 nm, output energy 30 mW) are efficient right after the application of the arch, because the patients reported weaker pain and pain intensity during the most painful day. During the laser treatment, pain reduced in its intensity more quickly.

The evaluation of LLLT effect on pain in orthodontic treatment in the studies [26, 27] showed that pain intensity in the laser group was lower, but not statistically significantly from the control group. Won Tae Kim et al. [28] reported that the effect of the laser therapy is not superior but reduces the highest level of pain, compared to the groups with placebo and analgesics. In another study [29], significant differences were found between LLLT and placebo groups, with LLLT group showing lower average values of the pain level for the whole period of time. Contrary, Esper et al. [20] reported that there was no significant reduction of pain in the laser group compared to the placebo group. The inconsistency in these reports is due to the modalities in its application, like one-session [1, 19, 30], or multiple-session therapy during a few days [18, 26], which can be the reason for the different efficiency of the laser therapy. It is thought that more frequent laser irradiation in the period of discomfort or pain may lead to significant reduction in the perception of pain. After the laser therapy, in the examined group, a reduction of pain was noted at the second visit, with complete absence of pain in 3 patients (20%) (Graph 2), which is in accordance with the results of some authors[7,29], who also confirmed a considerable pain reduction in patients treated with laser. The fact that laser induces fast pain relief after the first therapy and a total reduction of pain after the fourth day, compared to the control group where the strong pain relief was noted after the third day in 60% of patients and complete absence of pain was noted after the fifth day, is another prove for the laser analgesic effect (Graph 1). Taking into consideration these findings and that PGE2 is one of the most important chemical mediators in the acute phase of inflammation, which is also a factor

Pozitivne efekte lasera na dinamiku cirkulacije potvrđuju mnoga istraživanja [31,33,34]. Složeni efekat LLLT je razlog za dobijene rezultate u ovoj studiji.

Potrebna su dalja istraživanja različitih načina laserske terapije u preciznijem određivanju modaliteta njegove upotrebe, doze i primene, tako da se može potvrditi kao efikasna klinička procedura koja će imati značajan doprinos u ortodonciji.

Zaključak

Niskointenzivna terapija laserom je neinvazivna i sigurna procedura koja se može uspešno koristiti za smanjivanje bola tokom fiksne ortodontske terapije. Potrebna su dalja istraživanja da bi se pojasnili i odredili mogući mehanizmi analgetskog delovanja.

responsible for pain production, we propose the connection between the laser-induced inhibition of PGE2 and block of the cyclooxigenase with the reduction of pain [31], and we interpret our results in this context.

Biomicroscopic investigations and periodontal condition show that the gingival circulation becomes normal after the laser therapy, while the capillary permeability and venous congestion reduce, which lead to the quick correction of the inflammation and pain reduction [32]. The positive effects of the laser on the circulatory dynamics are approved by many researches [31, 33, 34]. The complex effect of LLLT is a reason for the results in this study. Further research for different manners of laser therapy in specifying the modality of its use, its dose and application are necessary, so it can be verified as efficient clinical procedure which will have a significant contribution in orthodontics.

Conclusion

The low level laser therapy is a non-invasive and safe procedure which can be successfully used for pain management during fixed orthodontics treatment. Further researches are necessary to elucidate and specify the possible mechanisms of pain reduction with laser therapy.

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PRIKAZ SLUČAJA
CASE REPORT
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CEMENTO-OSIFICIRAJUĆI FIBROM MAKSILE I MAKSILARNOG SINUSA: PRIKAZ SLUČAJA I PREGLED LITERATURE

CEMENTO-OSSIFYING FIBROMA OF THE MAXILLA AND MAXILLARY SINUS: A CASE REPORT AND LITERATURE REVIEW

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Sažetak

Uvod: *Veliku grupu benignih koštanih tumora vilica predstavljaju fibro-koštani tumori. Osnovu patofiziološkog procesa ove vrste tumora predstavlja zamena normalnog koštanog tkiva fibroznim tkivom. Cemento-osificirajući fibrom (COF) pripada ovoj grupi tumora.*
Prikaz slučaja: *Predstavljen je redak slučaj COF u maksili i maksilarnom sinusu kod četrdesetogodišnjeg muškarca .U početnom stadijumu se COF razvijao asimptomatski, kao kod većine benignih tumora. U kasnijim stadijumima, zavisno od lokalizacije, pre svega, pojavili su se drugi simptomi, kao što je deformitet lica,vilica i glave, oftalmološke smetnje, parestezije zbog kompresije nerava i dr. Urađena je subtotalna maksilektomija Weber-Fergusson pristupom.*
Zaključak: *U našem prikazu slučaja predstavili smo pacijenta sa retkom lokalizacijom COF. Za postavljenje definitivne dijagnoze COF, neophodan je, pre svega, MSCT-om i angiogram. Hirurška terapija je jedina metoda lečenja. Postoperativno praćenje pacijenta je neophodno zbog mogućih recidiva ili drugih komplikacija, uz kontrolni MSCT.*

Ključne reči*: cemento-osificirajući fibrom, maksila, maksilarni sinus, maksilektomija*

Abstract

Introduction*: A large group of benign bone tumors of the jaw are fibroosseous tumors. The basis of the pathophysiological processes of this type of tumor is the replacement of normal bone tissue by fibrous tissue. The cemento-ossifying fibroma (COF) belongs to this group of tumors.*
Case report*: A rare case of COF in the maxilla end maxillary sinus in a 40-year old patient is presented. In the initial stage , COF developed asymptomatically, as most benign tumors. In later stage other symptoms appeared , first of all facial deformities of the jaw and head, ophthalmic disorders, paresthesia due to compression of the nerves, and the like. We performed subtotal maxillectomy uing the Weber-Fergusson approach.*
Conclusion: *In this case report we presented a pacient with rare localisation of COF. To set a deffinitive diagnosis of COF, a detailed clinical examination with MSCT and angiography are required. Surgical therapy is only method of treatment. Postoperative monitoring of the patient is necessary, incuding tcontrol MSCT radiography.*

Key words: *cemento-ossifying fibroma, maxilla, paranasal sinus, maxillectomy*

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Uvod

Fibro-koštani tumori pripadaju benignim koštanim tumorima. Veoma često su zastupljeni u mandibuli i maksili. Sa patofiziološkog aspekta, kod ovih tumora, osnovu predstavlja zamena normalnog koštanog tkiva fibroznim tkivom. Cmento-osificirajući fibrom (COF) pripada ovoj grupi tumora.Prvi opis COF datira iz druge polovine 19. veka [1].

Svetska zdravstvena organizacija je 2005. godine svrstala COF u grupu benignih tumora fibro-koštanog porekla, jasno ograničenog, spore evolucije i sa dva podtipa: 1) epitelno-oskudni – jednostavni podtip i 2) epitelno-dominantni – SZO podtip [2,3]. Preko 80% COF se javlja u mandibuli. Druga po učestalosti lokalizacija je maksila, ali sa dosta manjom incidencijom. Postoje studije koje navode slučajeve COF u temporalnoj, okcipitalnoj kosti, nosnoj duplji i paranazalnim šupljinama [4]. Što se tiče životnog doba, COF je najzastupljeniji u četvrtoj deceniji života [5,6], i to sa prevalencijom kod ženskog pola u odnosu na muški (1,6:1) [7].

Klinička slika pacijenata sa COF je raznolika. U početnom stadijumu COF se razvija asimptomatski, kao većina benignih tumora. U kasnijim stadijumima, zavisno od lokalizacije, pre svega, dolazi do pojave niza simptoma, kao što su različiti deformiteti lica, vilica i glave, zapušenost nosa, razni oblici rinofaringitisa, oftalmološke smetnje, parestezije zbog kompresije nerava i dr.[8].

Postoje brojne klasifikacije COF prema različitim kriterijumima. Najprihvaćenija je klasifikacija prema kliničkoj slici na: neagresivni (konvencionalni) i agresivni (juvenilni tip) [9] . Neagresivni tip je standardni tip i ima sve prethodno navedene osobine benignog tumora. Juvenilna forma COF se odlikuje brzim rastom,velikim destruktivnim potencijalom. Najčešće se javlja kod dece uzrasta 2-15 godina, sa neznatnom dominacijom kod muškaraca[10] .

Klinička dijagnoza COF se ne moze postaviti samo kliničkim pregledom, već na osnovu anamneze, kliničkog pregleda i dodatnih radioloških procedura, uključujući OPGT, nativnu grafiju kostiju lica i vilica, CT i MRI. Zlatni standard za definitivnu dijagnozu je biopsija i patohistološki nalaz.

Diferencijalno-dijagnosički COF treba razlikovati od fibrozne displazije, cementofibrozne displazije i drugih tipova koštanih tumora benignog porekla i vaskularnih lezija[11].

Introduction

Fibro-osseous tumors belong to benign bone neoplasms. Very often, they appear in the mandible and maxilla. Concerning the pathophysiological aspect of this type of neoplasm, the principle process is the replacement of the normal bone tissue by fibrous tissue. The cemento-ossifying fibroma (COF) belongs to this group of tumors. The first description of the COF was in the second half of the 19th century[1].

In 2005, the World Health Organization classified COF in the group of a benign fibrous tumor of bone origin, clearly limited and with slow evolution [2,3] . Over 80% of the COFs occur in the mandible. The second frequent localization is in the maxilla. Also, some other papers described the COF in the temporal bone, occipital bone, nasal cavity, and paranasal sinuses [4]. Concerning the age, most patients present in the 4th decade of life [5,6], with the female to male ratio (1.6:1) [7].

Clinical findings in patients with COF differ. The initial stage of the COF develops asymptomatically, as most benign tumors. Later stages are determined by the tumor localization. A variety of symptoms occur, some of them being facial deformities of the jaw and head. Other symptoms include ophthalmic disorders as well as neurological ones, such as paresthesia due to the compression of the nerves [8].

In the reference literature, many classifications of COF are given, based on the various criteria. The most widely accepted classification is based on the clinical presentation: non-aggressive (conventional) and aggressive (juvenile type) [9]. The non-aggressive form is a standard type and has all characteristics of benign tumors. The juvenile form of the COF presents with rapid spread and locally destructive potential. This form most commonly occurs in children aged 5-15 years [10].

Clinical diagnosis of COF is very difficult and it consists of anamnesis, clinical examination and additional radiological procedures. These primarily include OPGT, native radiography of facial bones, and jaw CT and MRI. The gold standard for definitive diagnosis is biopsy and histopathological findings.

In the differential diagnosis, COF should be distinguished from fibrous dysplasia, cemento-fibrous dysplasia, and other types of benign bone tumors and vascular lesions [11].

Postoji velika etiopatogenetska i histološka sličnost između COF i centralno cemento-sificirajućeg fibroma, uzimajući u obzir kliničko ponašanje, radiološki nalaz, starosnu i polnu distribuciju učestalosti. Jedina razlika je histopatološka, jer u COF imamo koštano tkivo, a u drugom cementno tkivo [12].

Cilj ovoga rada bio je da se predstavi redak slučaj COF u maksili i maksilarnom sinusu kod četrdesetogodišnjeg muškarca. Pregledom dostupne literature veoma mali broj slučajeva je prikazan sa ovom lokalizacijom.

Prikaz slučaja

U leto 2008. godine u Kliniku za maksilofacijalnu hirurgiju Niš javlja se četrdesetogodišnji muškarac zbog otoka obrazne regije sa leve strane. U toku anamnestičke obrade navodi da se otok obrazne regije javio pre nekoliko godina bez subjektivnih tegoba. Godinama se postepeno uvećavao. Tek nakon dve godine se prvi put javlja lekaru, kada je upućen na maksilofacijalnu hirurgiju.

Osim bezbolnog otoka u predelu obraza levo, pacijent navodi otežano disanje na nos, posebno kroz levu nozdrvu, zatim na parestezije u predelu infraorbitalnog nerva sa leve strane, povremene otoke donjeg kapka levog oka sa sledstvenim konjuktivitisom.

Negira ranije operacije i postojanje hroničnih oboljenja.

Nakon anamnestičke obrade, urađen je klinički pregled glave, lica i vrata.

Inspekcijom se konstatuje tumefakt u obraznoj regiji levo, koji se u KK smeru pružao od nivoa mentolabijalne brazde do bukopalpebralnog sulkusa, i LL smeru od ugla usana do nivoa spoljnjeg ugla oka,veličine oko 3x4 cm. Koža je neizmenjena (slika 1).

Funkcija bulbomotora i ostala oftalmološka ispitivanja bila su u fiziološkim granicama. Ispadi u inervacionoj zoni ličnog nerva nisu bili prisutni.

Intraoralnom inspekcijom tumefakt se pružao u LL smeru od nivoa očajničke jame do tubera maksile levo, oduhvatajuću celi alveolarni nastavak i nastavljajući se put pozadi ka retromaksilarnom prostoru, potiskujući meka tkiva obraza put napred. Sluzokoža je nepromenjena.

Palpacijom se utvrdio tumefakt tvrde konzistencije, bezbolan i nepokretan. Regionalno se limfonodusi nisu palpirali.

Nalaz prednje rinoskopije ukazivao je na suženje levog zajedničkog nosnog hodnika zbog ispupčenja u predelu srednje nosne konhe.

Kao dodatne dijagnostičke procedure korišćeni su MSCT i angiografija.

Cemento-ossifying fibroma and central cemento-ossifying fibroma are very similar concerning the clinical behavior, radiographic findings, age and sex distribution frequency. The only difference is histological because the COF has the bone tissue and the other one has the cement tissue[12].

The aim of this study was to present a rare case of the COF in the maxilla and maxillary sinus in a forty-year-old man. In the review of the available literature, very few cases have been presented with this localization.

Case report

In the summer of 2008, at the Department of Maxillofacial Surgery in Nis, a forty-year-old man presented with a swollen cheek region on the left side. In the medical history, the patient stated that swelling of the cheek region had occurred a few years before without subjective complaints. Over years, the occurrence gradually augmented. Two years after he visited a doctor for the first time, who referred him to the Clinic of Maxillofacial Surgery.

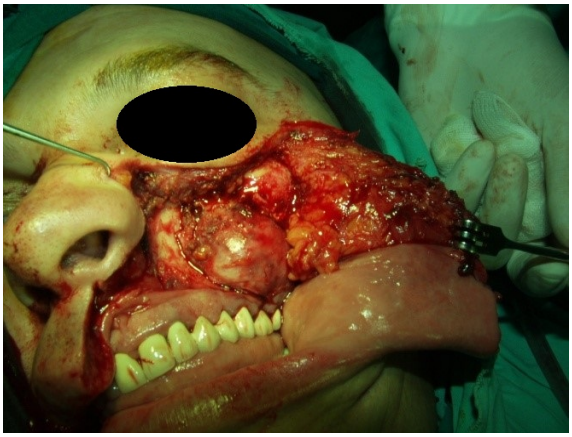
Apart from a painless swelling of the left cheek, the patient mentioned difficulty breathing through the nose, especially through the left nostril, then paresthesia in the area of infraorbital nerve on the left side, occasional swelling of the lower left eyelid, with the accompanying conjunctivitis.

He denied the existence of prior surgery and chronic diseases.

After taking the medical history, the clinical examination of the head, face and neck was conducted.

Inspection indicated a tumefaction of the left buccal region, which was in the cranio-caudal direction extending from the ridge of the mentolabial sulcus to the buccopalpebral sulcus, and latero-lateral direction from the corner of the mouth to the level of an outside corner of the eye, measuring about 3x4 cm. The skin over tumefactions remained unchanged (Figure1). Bulbar motor function and other ophthalmologic examinations were within normal limits. Excess in the distribution area of the facial nerve was not present.

Intraoral inspection showed that the tumefaction stretched in the latero-lateral direction from the level of canine cave to the left maxillary tuberosity, encompassing the entire alveolar process and continuing the path back to the retromaxillary space, pushing the soft tissues of the cheek forward.



Slika 1. Intraoperativna slika
Figure 1. Intraoperative image

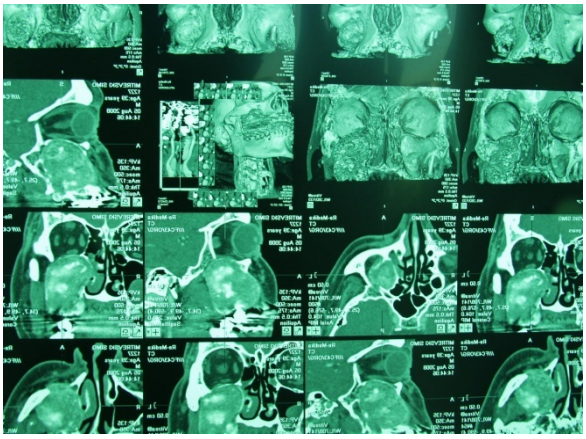


Figure 2. Preoperativni MSCT nalaz
Figure 2. Preoperative MSCT image

Nalaz MSCT je ukazivao na dobro ograničenu tumorsku masu dominantno u predelu leve maksile i levog maksilarnog sinusa, koja se u LL smeru pružala od nivoa tubera maksile do spoljnog zida nosne šupljine, praveći izbočinu u predelu srednje konhe. U KK smeru se pružao od alveolarnog nastavka maksile do na 3 mm od poda leve orbite, ne destruirajući je. U AP smeru od nivoa obrazne strukture, zahvatajući maksilu i sinus do zadnjeg zida, ne razarajući ga (slika 2).

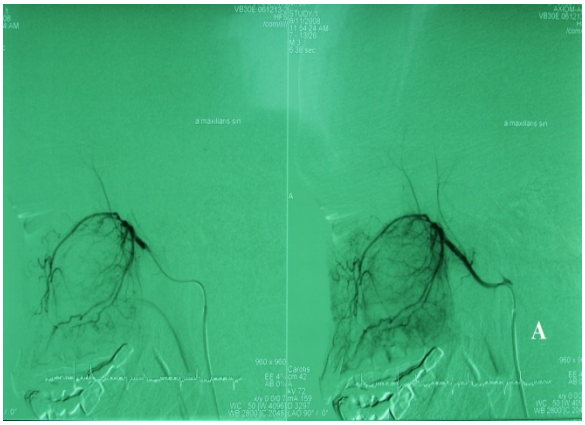
Angiografija gornjevilične arterije je isključivala vaskularno poreklo tumefakta. Ukazivala je na patološku vaskularizaciju tumefakta iz završnih grana arterije maksilaris. Infraorbitalna arterija je bila dislocirana. Urađena je embolizacija završnih grana partikulama BEAD BLOCK-a (slika 3).

Hirurška intervencija urađena je u opštoj endotrahealnoj anesteziji. Urađena je subtotalna maksilektomija Weber-Fergusson pristupom. Intraoperativno je konstantovana tumorska formacija, koja je razarala prednji zid maksilarnog sinusa, pružajući se od očnjačke jame do tubera i neuzurirajući krov iste. Uklonjen je tumefakt sa okolnim koštanim tkivom maksile i delom predela infratemporalne i pterigopalatinske lože, uz očuvanje poda orbite, bočnog zida nosne duplje, dela zadnjeg zida maksile i tubera. U defekt je plasirana jod štrajfna i prekriven mekotkivnim režnjem.

Mucosa over the tumefactions remained unchanged.

On palpation, the tumefaction was of hard consistency, painless and immobile. Regionally, lymph nodes were not palpable. Anterior rhinoscopy findings pointed to the narrowing of the left common nasal meatus due to bumps in the area of the middle nasal conchae. MSCT and angiography were employed as the additional diagnostic procedures.

MSCT findings pointed to the well-circumscribed tumor mass predominantly in the left maxilla and left maxillary sinus, which in latero-lateral direction stretched from the level of the maxillary tuberosity to the outer wall of the nasal cavity, making a bulge in the middle area of the conch. In the cranio-caudal direction, the tumefaction extended from the alveolar process of the maxilla to 3 mm from the floor of the orbits without destroying the same. In the anterior-posterior direction it stretched from the level of the buccal structure, capturing maxilla and maxillary sinus to the posterior wall, without destroying it (Figure 2). Maxillary artery angiography excluded the vascular origin of the tumefaction. It pointed to the pathological vascularization of the tumefaction by the terminal branches of the artery maxillaris. Infraorbital artery was dislocated. The terminal branches were successfully embolized with BEAD BLOCK particles (Figure 3A, 3B).



Slika 3. *A.* Maksilarna arterija pre embolizacije. *A.* Maxillary artery before embolization

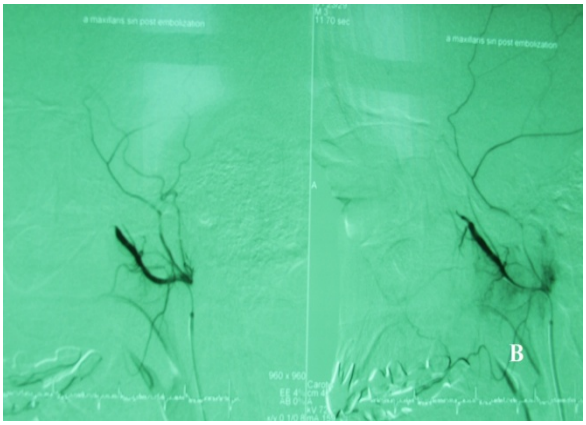


Figure 3. *B.* Maksilarna arterija posle embolizacije. *B.* Maxillary artery after embolization.

Postoperativno je ordinirana anti-biotska terapija u trajanju od 7 dana.

Postoperativni tok protekao je bez kompikacija.

Ex tempore patohistološki nalaz je ukazivao na benignu tumorsku formaciju mezenhimalnog porekla.

Definitivan parafinski patohistološki nalaz je bio centralni osificirajući fibrom.

Nakon godinu dana, klinički je registrovano odsustvo recidiva (slika 4).

Petogodišnji postoperativni period protekao je bez recidiva i komplikacija. Pacijent se jednom godišnje kontroliše.

Slika 4. Slika pacijenta jednu godinu posle operacije

Figure 4. An image of the patient one year after the surgery

Surgery was done under the general endotracheal anesthesia. We performed subtotal maxillectomy with the Weber-Fergusson approach. Tumor formation was ascertained during the surgery, which destroyed the anterior wall of the maxillary sinus, stretching from the canine pit to the tuberosity, and without destroying its roof. Tumefaction, with the surrounding bone in the maxilla and part of the infratemporal and pterygopalatine lodge was removed, while preserving the orbital floor, lateral wall of the nasal cavity, part of the posterior wall of the maxilla and tubers. Iodine gauze was placed in the defect and covered with a soft tissue flap.

Administration of antibiotic therapy lasted for 7 days. The postoperative recovery went without complications. Ex tempore histopathological findings pointed to the formation of a benign tumor from the mesenchymal source. The definitive paraffin histopathological finding showed a central ossifying granuloma.

One year after surgery, there was no relapse on clinical examination (Figure 4).

Five-year postoperative period passed without recurrence and complications. The patient has annual controls.

Diskusija

Kao što je već pomenuto, veliku grupu benignih koštanih tumora čine fibro-koštani tumori. Osnovu patofiziološkog procesa ove vrste tumora predstavlja zamena normalnog koštanog tkiva fibroznim tkivom. Cemento-osificirajući fibrom (COF) pripada ovoj grupi tumora, koja još obuhvata i fibroznu displaziju, cemento-fibroznu displaziju i još nekoliko podtipova [11].

Etiologija i etiopatogeneza COF nije razjašnjena do danas. Postoje brojne teorije, ali su samo dve opšteprihvaćene. Prema jednoj, neka vrsta agensa, kao što je trauma, bakterija ili sl, dejstvujući na periodontalnu membranu, dovodi do pojave COF. Prema drugoj teroriji, neka vrsta zaostalog mezenhimalnog tkiva ili delovi periodoncijuma na iregularnom mestu dovode do pojave COF [13]. Za naš prikaz slučaja prihvatljivija je druga teorija.

Intraoperativni nalaz COF ukazivao je na solidno tumorsko tkivo biserno tamnosive boje, što je u karakteristično za većinu koštanih lezija. Histopatološka analiza COF ukazivala je na fibrozno-vezivno tkivo sa delovima koštanog tkiva, okruženo pločasto-slojevitim epitelom, što je bilo u skladu sa drugim studijama[6]. Koštano tkivo je u obliku trabekula raspoređeno u samom tumorskom tkivu, dajući specifičnu sliku samom preparatu COF [14].

Definitivna dijagnoza COF predstavlja izazov za svakoga. Diferencijalno-dijagnostički COF treba razlikovati od drugih tipova benignih koštanih tumora, pre svega, iz grupe fibro-koštanih tumora. Zatim, od malignih tumora kostiju, kao što su osteosarkomi, hondrosarkomi, planocelularni karcinomi i dr.[11], kao i od vaskularnih lezija.

Dobra ograničenost COF pomaže diferencijalnu dijagnozu na radiološkom nalazu (CT ili MRI) u odnosu na maligne entitete, pre svega, hondrosarkom i osteosarkom.

Pregledom literature, većina slučajeva COF, prema kliničkoj slici, pripada neagresivnom tipu (konvencionalnom) [9], kao što je bio i slučaj sa našim pacijentom.

Takođe, većina pacijenata sa COF pripada starosnoj grupi od 20 do 40 godina [5,6], kao što je naš pacijent. Što se tiče polne distribucije, koja je u korist žena [7], naš pacijent je bio muškog pola.

Discussion

As we mentioned before, the fibro-osseous tumors represent a group of benign bone tumors. The basic physiological process in that group of tumors is the replacement of the normal bone tissue with the fibrous tissue. Central-ossifying fibroma (COF) belongs to that group of tumors. Beside COF, that group also includes fibrous dysplasia, cemento-fibrous dysplasia and several other subtypes[11].

Etiology and etiopathogenesis of COF are still unknown. Several theories about the origin of COF have been given, but only two are accepted by most investigators. The first theory says that some kind of agent (such as trauma, bacterial infection or similar) attacks the periodontal membrane, leading to the emergence of COF. According to the second theory, some kind of residual mesenchymal tissue or periodontal tissue in irregular place leads to the COF[13]. For our case report, the second theory is acceptable.

Intraoperative finding showed a solid tumor mass, of dark gray color, which is typical of the majority of the osseous lesions. Paraffin pathohistological analysis of COF showed the fibrous tissue with parts of the osseous tissue surrounded with the squamous epithelium, and these findings are in correlation with some another studies.[6]The osseous tissue is trabecularly distributed in the tumor tissue, making a very interesting picture of COF[14]. Radiological result of the CT scan showed the area of low density with the signs of osteolysis, separated from the rest of the osseous tissue with thin membrane.

Definitive diagnosis of COF is a challenge for everyone, and the differential diagnosis of COF should exclude other types of benign bone tumors, primarily fibro-osseous tumors, then malignant bone tumors such as osteosarcoma, chondrosarcoma, squamous cell carcinoma, etc.[11], as well as the vascular lesions.

Being well circumscribed helps with making the differential diagnosis on the radiological finding (CT or MRI) and differentiation of COF from malignant tumors such as chondrosarcoma and osteosarcoma.

Po učestalosti, COF se dominantno javlja u mandibuli (preko 80%), kao što su dokazali Eversole i al.[3], dok su druge lokalizacije dosta ređe, kao što je i naš prikaz slučaja. Publikovan je veoma mali broj radova sa lokalizacijom COF u paranazalnim šupljinama.

Bez sumnje, jedini tretman COF je hirurški tretman. Drugi vidovi terapije nisu indikovani. Preporuka većine autora je kompletno uklanjanje lezije u što ranijem stadijumu bolesti, kao metod izbora.

U zavisnosti od veličine tumora, tretman može biti u vidu kiretaže ili enukleacije kod manjih lezija. Kod većih, kao što je bio slučaj i kod našeg pacijenta, hirurški tretman podrazumeva široku resekciju okolne zdrave kosti sa tumorom.

Recidivi COF su opisani u literaturi. Incidencija recidiva posle hirurškog tretmana je različita. Neki autori navode pojavu recidiva u 28% pacijenata nakon kiretaže COF [4]. Zbog moguće pojave recidiva, postoperativno praćenje je neophodno. U prvih šest meseci jednom mesečno, a kasnije na tri meseca. Kontrolni MSCT je indikovan nakon šest meseci od operacije.

U našem slučaju urađena je subtotalna maksilektomija sa COF. Postoperativni period je protekao bez komplikacija. Petogodišnji postoperativni period bez recidiva.

Postoje radovi koji opisuju pacijente sa COF koji su bez simptoma odbili hirurški tretman[14]. Njihovo stanje se prati u određenim vremenskim intervalima.

Zaključak

U našem prikazu slučaja predstavili smo pacijenta sa retkom lokalizacijom COF. Za postavljenje definitivne dijagnoze COF, neophodan je detaljan klinički pregled sa anamnestičkom obradom i dodatnim radiološkim ispitivanjem, pre svega, MSCT-om i angiografijom. Hirurška terapija je jedina metoda lečenja. Postoperativno praćenje pacijenta je neophodno zbog mogućih recidiva ili drugih komplikacija, uz kontrolni MSCT.

In the review of literature, most of the cases of COF, according to their clinical presentation, belong to the non-aggressive type (conventional)[9], as was the case with our patient.

Furthermore, the highest incidence of COF is encountered in a population of 20 - 40 years old[5,6], as was the case with our patient. Although literature data show that COF predominantly occurs in women[7], our patient was male.

By frequency, COF predominantly occurs in the mandible (over 80%) as demonstrated by Eversoleet al.[3], while other locations are less common, as presented in our case report. A very small number of articles with the localization COF in the paranasal sinuses have been published.

Undoubtedly, the only treatment of COF is a surgical treatment. Other forms of therapy are not indicated.

Depending on the size of the tumor, curettage and enucleation are the methods of choice for small lesions. For larger sizes, as was the case in our patient, surgical treatment includes wide resection of the healthy bone surrounding the tumor.

Recurrences of COF are described in literature. The incidence of recurrence after surgical treatment is different. Some authors report the occurrence of relapse in 28% of patients after curettage of COF.[3] Given the rate of relapse, postoperative follow-up is necessary - once a month in the first six months and later every three months. Control MRI is indicated six months after the operation.

In our case, subtotal maxillectomy with COF was performed. The postoperative period went without complications. Five-year postoperative period went without recurrence.

There are articles that describe patients with COF which are asymptomatic or refused surgical treatment[14]. Their condition is monitored at specific time intervals.

Conclusion

In this case report, we presented a patient with a rare localization of the COF. To set a definite diagnosis of COF, a detailed clinical examination is required, with anamnesis and additional radiologic examination, especially MRI and angiography. Surgical therapy is the only method of treatment. Postoperative monitoring of the patient is necessary, including the control MRI, due to possible recurrence or other complications.

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POTPUNA REHABILITACIJA USNE ŠUPLJINE POSLE LEČENJA KARIJESA U RANOM DETINJSTVU:PRIKAZ SLUČAJA

COMPLETE REHABILITATION OF MOUTH CAVITY AFTER EARLY CHILDHOOD CARIES TREATMENT: A CASE REPORT

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Sažetak

Uvod:*Karijes ranog detinjstva je jako ozbiljan zdravstveni problem, kako u zemljama u razvoju tako i u razvijenim zemljama. Ovde je predstavljen klinički slučaj potpunog oporavka od karijesa u ranom detinjstvu.*

Prikaz slučaja: *Petoipogodišnji pacijent muškog pola koga je dovela majka prijavljen je na Odeljenje dečje stomatologije zbog karioznih zuba. Ispitivanje usne duplje utvrdilo je meš-ovito nicanje zuba sa karijesom: 51, 52, 54, 55, 61, 62, 63, 64, 71, 72, 73, 81, 82, 84, 85 i zubi sa privremenim punjenjem na 74 i 75. Urađena je korekcija glas jonomer cementom na zubima 71, 72, 81, 82, 83. Pulpoktomija je rađena na zubima 51, 52, 61, 62, 63, 74 i 75. Umeci od polietilenskih vlakana (Ribond) su stavljeni na zube 51, 52, 61, 62 i 63. Finalna korekcija sa celuloidnim strip krunicama urađena je na zubima 51, 52, 61 I 62, a kompozitno popravljanje na zubu 63. Krunice od nerđajućeg čelika su postavljene na zubima 74, 75, 84 i 85.*

Zaključak: *Potpuni oporavak usta deteta nakon karijesa u ranom detinjstvu je izazov za dečjeg stomatologa. Pored koristi za oralno zdravlje, oralna rehabilitacija takođe doprinosi poboljšanju opšteg i psihološkog stanja deteta.*

Ključne reči: karijes, rano detinjstvo, potpuna rehabilitacija usta, krunice od nerđajućeg čelika

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Abstract

Introduction: *Early childhood caries (ECC) is a very serious public health problem in both developing and developed countries. We presented here a case of early childhood caries with full mouth rehabilitation.*

Case report: *A five-and-a-half-year-old male patient accompanied by his mother reported to the department of pediatric dentistry with a chief complaint of severely decayed teeth. Intraoral examination revealed a set of mixed dentition with caries in relation to teeth 51, 52, 54, 55, 61, 62, 63, 64, 71, 72, 73, 81, 82, 84, 85 with some temporary dressing in teeth 74 and 75. Restoration with glass iomomeric cement on 71, 72, 81, 82, 83 tooth were done. Pulpectomy was done in relation to teeth 51, 52, 61, 62, 63, 74 and 75. Polyethylene fiber post ((Ribbond) was placed in relation to teeth 51, 52, 61, 62 and 63. Final restoration with celluloid strip crowns in relation to teeth 51, 52, 61 and 62 were placed and composite restoration was done with tooth 63. Stainless steel crowns were placed on teeth 74, 75, 84 and 85.*

Conclusion*: Full mouth rehabilitation of a child with early childhood caries is challenging for pediatric dentist. Oral rehabilitation also contributes to the improvement of general and psychological wellbeing of the child.*

Key words: caries, early childhood, full mouth rehabilitation, stainless steel crowns

Uvod

Karijes ranog detinjstva (KRD) je ozbiljan stomatološki problem koji utiče na decu koja su tek prohodala i onu malo stariju. KRD se može definisati kao prisutnost jednog ili više pokvarenih zuba, onih koji nedostaju ili ispunjenih površina na bilo kom mlečnom zubu deteta od 71 meseca ili mlađeg. Oko 40% dece dobije dentalni karijes do pete godine, a 8% dvogodišnjaka ima neki oblik propadanja zuba ili već saniranih karijesnih lezija. Termin KRD je uveden 1990-tih, kao pokušaj da se pažnja skrene na višestruke faktore, poput socioekonomskih, psiho-socijalnih i bihevioralnih problema, koji doprinose karijesu u ranim godinama, umesto da se kao jedinim uzrocima pripišu neodgovarajuće metode hranjenja, kao što su korišćenje flašice i produženo dojenje [4].

Potpuna rehabilitacija usta, uključujući i estetsku restauraciju ozbiljno oštećenih mlečnih zuba, oduvek je bio izazov za stomatologa, ne samo zbog ograničenosti u dostupnim materijalima i tehnikama, već i zbog toga što su deca koja zahtevaju ovakva popravljanja obično najmlađi pacijenti i samim tim oni sa kojima je najteže sarađivati. I pored toga, uz saradnju pedodontista sa decom, kao i uz dostupnost novijih materijala, poput strip krunica (3M ESPE) i umetaka od poli-etilenskih vlakana, model lečenja se impro-vizuje po predstavljenom scenariju. Ovaj klinički slučaj opisuje potpunu rehabilitaciju usta emocionalno nezrelog pacijenta koji pati od KRD-a, vidljivog kroz višestruko uništene zube.

Klinički slučaj

Petoipogodišnji pacijent muškog pola koga je dovela majka prijavljen je na Odeljenje dečje stomatologije žaleći se na ozbiljno pokvarene zube. Dete je bilo stidljivo i bez dovoljno samopouzdanja. Njegova medicinska istorija nije pokazala nikakve sistemske, alergijske ili imuno kompro-mitujuće bolesti. Dete je rođeno prirodnim putem i u terminu. Utvrđeno je da pacijent ima istoriju hranjenja na flašicu i produženog dojenja.

Ispitivanje usne duplje utvrdilo je meš-ovito nicanje zuba sa karijesom: 51, 52, 54, 55, 61, 62, 63, 64, 71, 72, 73, 81, 82, 84, 85 (slika 1. – slika 4.) i privremenio punjenje na zubima 74 i 75 (slika 5).

Introduction

Early childhood caries (ECC) is a serious dental problem that affects the infants and toddlers. ECC can be defined as the presence of one or more decayed, missing or filled tooth surfaces in any primary tooth in a child 71 months of age or younger [1]. Around 40% of children have dental caries by the age of five, and 8% of two-year-old children have some form of decay or previous restorations[2,3]. The term ECC was introduced in the 1990s in an attempt to focus attention on the multiple factors such as socioeconomic, psychosocial and behavioral problems that contribute to caries at an early age rather than describe sole causation of inappropriate feeding methods like bottle use and prolonged breastfeeding on demand [4].

Full mouth rehabilitation including the esthetic restoration of severely mutilated primary teeth has always been a challenge for the dentist for a long time, not only because of the limitations of the available materials and techniques but also because the children who require such restorations are usually among the youngest and least manageable group of patients. However, with the pedodontist's handling the children and availability of newer materials like strip crowns and polyethylene fiber post the treatment modality is improvised in the present scenario. The presented case report describes the full mouth rehabilitation of an emotionally immature patient suffering from early childhood caries presenting with multiple mutilated teeth.

Case Report

A five-and-a-half-year-old male patient accompanied by his mother reported to the department of pediatric dentistry with a chief complaint of severely decayed teeth. The child was a bit shy and less confident. His medical history revealed no systemic, allergic, or immunocompromising illness. The patient was a full-term child, born during a normal delivery. Diet history revealed that patient had a history of bottle feeding and breastfeeding on demand.

Intraoral examination revealed a set of mixed dentition with caries in relation to teeth 51, 52, 54, 55, 61, 62, 63, 64, 71, 72, 73, 81, 82, 84, 85 (Fig. 1- Fig. 4) with some temporary dressing in teeth 74 and 75 (Fig. 5).

Periapikalni radiograf usne duplje utvrdio je prisutnost pulpe kod zuba 51, 52, 61, 62, 63, 64, 74 i 75. Zaustavljeni karijes se video kod zuba 55 i 65. Maksilarni mlečni kutnjaci 54 i 64 su znatno oštećeni, uz periapikalno gnojenje i pokretnost.

Intraoral periapical radiographs revealed pulp involvement with teeth 51, 52, 61, 62, 63, 64, 74, 75. Arrested caries was seen in teeth 55 and 65. Maxillary first molars i.e. 54 and 64 were grossly destructed with periapical abscess and mobility.

Slika 1: Predoperativna slika koja pokazuje KRD sa prednje strane

Fig. 1: Preoperative photograph showing early childhood caries (front view)

Slika 2**:** Predoperativna slika iz desnog ugla

Fig. 2: Preoperative photograph showing the right side

Slika 3**:** Predoperativna slika iz levog ugla

Fig. 3: Preoperative photograph showing the left side

Slika 4: Maksilarni zatvoreni ugao

Fig. 4: Maxillary occlusal view

Inicijalni tretman uključio je odgovarajuće preventivne mere, poput oralne profilakse i jednostavnih popravki, u cilju detetovog privikavanja. Korekcija glas jonomer cementom rađena je na zubima 71, 72, 81, 82, 83. Pulpoktomija je rađena na zubima 51, 52, 61, 62, 63, 74 i 75. Umeci od polietilenskih vlakana (Ribond) su stavljeni na zube 51, 52, 61, 62 i 63. Finalna korekcija sa celuloidnim strip krunicama urađena je na zubima 51, 52, 61 i 62, a kompozitno popravljanje na zubu 63 (slika 6).

Pulpotomija je sprovedena na zubima 84 i 85, jer im je bila neophodna krunica od

Initial treatment involved appropriate preventive measures like oral prophylaxis and simple restorations to desensitize the child. Glass ionomer cement restoration was done with teeth 71, 72, 81, 82, 83. Pulpectomy was done in relation to teeth 51, 52, 61, 62, 63, 74 and 75. Polyethylene fiber post ((Ribbond) was placed in relation to teeth 51, 52, 61, 62 and 63. Final restoration with celluloid strip crowns in relation to teeth 51, 52, 61 and 62 were placed and composite restoration was done with tooth 63 (Fig. 6). Pulpotomy was carried out in teeth 84 and 85 as they needed the stainless steel crown to increase the vertical height.

nerđajućeg čelika kako bi uvećali vertikalnu visinu. Krunice od nerđajućeg čelika su postavljene na zubima 74, 75, 84 i 85 (slika 7). Izvršeno je vađenje zuba 54 i 64 pod lokalnom anestezijom. Nans (nance) palatalni čuvar prostora sa nerđajućim čeličnim žicama stavljen je u maksilarni lučni prostor kod zuba 55 i 65 (slika 8). Pacijentu su savetovani redovni pregledi.

***Slika 5*:** Mandibularni zatvoreni ugao

***Fig. 5*:** Mandibular occlusal view

Slika 7: Rehabilitacija (mandibularni ugao)

Fig. 7: Rehabilitation (mandibular view)

Diskusija

Iako se uvođenjem preventivnih mera, poput fluoroida, prevalencija karijesa značajno smanjila, još uvek ima prisutnih slučajeva dece sa dentalnim karijesom. Rana pojava karijesa i masovno uništavanje zuba vodi ka problemima kao što su gubitak sposobnosti efektivnog žvakanja, smanjena vertikalna dimenzija, kompromitovana estetika, razvijanje neprirodnih navika poput guranja jezika i psiholoških problema.

Stainless steel crowns were placed on teeth 74, 75, 84 and 85 (Fig. 7). Extraction of teeth 54 and 64 was done under the local anesthesia. Nance palatal arch space maintainer was given in the maxillary arch with stainless steel bands on teeth 55 and 65 (Fig. 8). The patient was advised for regular check-ups.

***Slika 6*:** Postoperativna slika iz prednjeg ugla

Fig. 6: Postoperative photograph (front view)

Slika 8: Rehabilitacija (maksilarni ugao)

Fig. 8: Rehabilitation (maxillary view)

Discussion

Though the caries prevalence has decreased substantially with the introduction of preventive measures like fluorides, children still continue to present with dental caries. The early carious involvement and gross destruction of the teeth leads to the problems like loss of masticatorv efficiencv. reduced vertical dimension, compromised esthetics, development of abnormal habits like tongue thrusting and psychological problems.

Potpuna rehabilitacija usne duplje od ovakvih zuba je veliki izazov za dečju stomatologiju. U popravljanju prednjih mlečnih zuba se koriste brojni materijali i tehnike. Stakleni jonomer cementi, amalgami, silikatni cementi, kompomeri, kompozitne smole, krunice od nerđajućeg čelika, otvorene krunice od nerđajućeg čelika i krunice od polikarbonata su danas u čestoj upotrebi. Amalgam i krunice od nerđajućeg čelika se ne preporučuju kada je prioritet estetika. U skorije vreme, cirkonske krunice postaju popularne zbog svoje estetske prihvatljivosti.

Silikatni cementi i smole se primenjuju kod manjih lezija i često nisu dobar izbor kada se koriste za sanaciju većih karioznih lezija. Polikarbonskim krunicama se postiže visok nivo estetike, ali one iziskuju pažljive procese cementiranja kako bi se zadržale. Glavni problem kod polikarbonskih krunica je neuspelo cementiranje, koje rezultira ranim lomljenjem i otpadanjem same krunice, čak , pre zamene saniranog zuba [6]. U ovom kliničkom slučaju korišćena je celuloidna premodifikovana krunica sa kompozitno smolastim materijalom u cilju dobijanja estetskog rezultata usled usklađenosti nijansi, funkcionalnosti i jer je dokazano ekonomična.

Kod dece sa kombinovanim nicanjem mlečnih zuba postavljanje krunica od nerđajućeg čelika je efektan način saniranja ozbiljno uništenih i mlečnih i stalnih molara. Kod mlečnih zuba, krunice od nerđajućeg čelika se indikuju kod pulpotomije i pulpektomije, a takođe su primenljive i kod zuba sa razvojnim deformitetima, kao i kod lezija karijesa koje pokrivaju veću površinu, a gde bi amalgam verovatno imao problema sa retencijom, ujedno eliminišući značajnu količinu zdravog zubnog tkiva. Krunice od nerđajućeg čelika su izuzetno trajne, manje skupe, podložne minimalnoj tehničkoj osetljivosti tokom ugrađivanja i nude prednost pune koronalne pokrivenosti. U predstavljenom slučaju, krunice od nerđajućeg čelika su korišćene na zubima 74 i 75, prateći pulpektomiju. Pulpotomija je urađena na zubima 84 i 85. Usledilo je postavljanje krunica od nerđajućeg čelika koje su pomogle u uvećanju okluzivne vertikalne visine.

Potpuni oporavak usta deteta nakon karijesa u ranom detinjstvu je izazov za dečjeg stomatologa. Pored dentalnih benefita, oralna rehabilitacija takođe doprinosi poboljšanju opšteg i psihološkog stanja deteta.

The full mouth oral rehabilitation of these teeth is a great challenge to the pediatric dentistry. Numerous materials and techniques have been used in the restoration of primary anterior teeth. Glass ionomer cements, amalgams, silicate cements, compomer, composite resins, stainless steel crowns, open face stainless steel crowns, and polycarbonate crowns are frequently used today. Amalgams and stainless steel crowns are contraindicated when esthetics is a major consideration. Recently, zirconium crowns are becoming popular due to its esthetic acceptance.

Silicate cements and resins are indicated for small lesions, but often fail when used to restore larger lesions.[5] Polycarbonate crowns provide excellent esthetics, but require careful cementation procedures for retention. Failure in the cementation of the polycarbonate crown is a major problem, resulting in early fracture and loss of the crown prior to the exfoliation of the restored tooth.[6] In the present case, celluloid preformed crown with composite resin material was used because of its advantage of producing an esthetic result because of shade matching, functional and proven economical restoration.

In children with the primary and the early mixed dentition, stainless steel crowns are an effective type of restoration in managing severely destructed primary molars and permanent molars in children. In primary teeth, the stainless steel crowns are indicated following pulpotomy or pulpectomy and are also applicable for teeth with developmental defects, large carious lesions involving multiple surfaces where amalgam is likely to fail and teeth are likely to fracture.[7] The stainless steel crowns are extremely durable, less expensive, and subject to minimal technique sensitivity during placement and offer the advantage of full coronal coverage.[8] In the present case, stainless steel crowns were used on teeth 74 and 75 following pulpectomy. Pulpotomy was done in teeth 84 and 85 and was followed by placement of stainless steel crowns which aided in increasing the vertical height of occlusion.

Full mouth rehabilitation of a child with early childhood caries is challenging for pediatric dentist. Apart from the dental benefits, oral rehabilitation also contributes to the improvement of general and psychological wellbeing of the child.

Pacijent je imao simptom Frankelovog ponašanja sa ocenom 1, tj. negativnom ocenom, ali saradnja sa njim je uspela uz pomoć tehnike nefarmakološkog tretmana. Prema pacijentu se ponašalo jako pažljivo, sa izuzetno velikom dozom strpljenja, što je zahtevalo i višestruke posete − rad u više seansi. Na kraju tretmana, pacijent je otišao sa odeljenja ne samo oslobođen bolesti usne duplje, već i kao jači i samopouzdaniji pojedinac, sa pozitivnijim stavom prema posetama dečijem stomatologu.

Zaključak

Potpuni oporavak usta deteta nakon karijesa u ranom detinjstvu je izazov za dečjeg stomatologa. Pored koristi za oralno zdravlje, oralna rehabilitacija takođe doprinosi poboljšanju opšteg i psihološkog stanja deteta.

The patient had a Frankl behavior rating one i.e. definitely negative, but was managed using only non-pharmacological behavior management techniques. The patient was carefully dealt with an extraordinary amount of patience and hence required multiple sittings. At the end of treatment, the patient walked out of the department not only with disease free oral cavity but also as a stronger and more confident individual with a positive attitude towards dental treatment.

Conclusion

Full mouth rehabilitation of a child with early childhood caries is challenging for pediatric dentist. Oral rehabilitation also contributes to the improvement of general and psychological wellbeing of the child.

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STOMATOLOŠKA ZAŠTITA DECE SA POREMEĆAJIMA AUTISTIČNOG SPEKTRA

DENTAL HEALTH CARE FOR CHILDREN WITH AUTISM SPECTRUM DISORDERS

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Sažetak

Uvod: *Poremećaji autističnog spektra (ASD) su pervazivni poremećaji koji počinju u ranom detinjstvu. Prevalencija ovih poremećaja se u poslednjih nekoliko decenija povećala. Sam poremećaj nema direktni uticaj na oralno zdravlje, ali ponašanje dece može bitno da ga ugrozi. Zbog neprihvatanja održavanja oralne higijene, u usnoj duplji se nagomilava dentalni biofilm koji dovodi kako do karijesa i kasnije njegovih komplikacija tako i do nastanka gingivoparodontalnih oboljenja. Veliki procenat dece sa ASD tokom stomatološke intervencije ne sarađuje, hiperaktivno je, napeto i uznemireno. Sve to komplikuje stomatološku intervenciju i onemogućava njeno izvođenje, zbog čega su i indikacije za ekstrakcije zuba proširene. Kako bi se sačuvalo oralno zdravlje dece sa ASD potreban je individulani pristup svakom pacijentu.*
Zaključak*: Put do zdravih usta i zuba kod dece sa ASD je dug i mukotrpan, nije neostvariv i nemoguć, ali od roditelja i dečjeg stomatologa zahteva veliko strpljenje i upornost.*

Ključne reči*: autizam, stomatološka zaštita*

Abstract

Introduction: *Autism spectrum disorders (ASD) are pervasive disorders beginning in early childhood. The prevalence of these disorders has been on the rise over the last few decades. A disorder of this kind does not have any direct impact on the oral health, but the behavior of the affected children can markedly deteriorate it. Due to a poor compliance to oral hygiene and maintenance of oral health, dental film accumulates in the oral cavity, leading to both caries and its complications, and gingival-periodontal diseases. A high percentage of children with ASD are not sufficiently compliant during dental interventions, being hyperactive, tense, and often highly agitated. Any dental intervention in such children is therefore very complicated or it cannot be performed at all, consequentially broadening the spectrum of indications for dental extractions. In order to preserve the oral health in children with ASD, an individualized approach to each patient is thus necessary.*
Conclusion: *The journey to a healthy oral cavity and teeth in children with ASD is full of twists and turns, but the desired goals can be realized, although requiring considerable patience and perseverance from both the parents and pediatric dentists.*

Key words: *autism, dental health care*

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Uvod

Poremećaji autističnog spektra (ASD) su biološki razvojni poremećaji ljudskog mozga, koji su zbog svoje prirode nastanka i široke manifestacije vrlo složeni. Autistični poremećaj je pervazivni poremećaj koji počinje u ranom detinjstvu. Osnovni simptomi bolesti su nedostatak emocionalnih odgovora prema okolini, odnosno ljudima, stvarima i događajima koji ih okružuju, nedostatak verbalne i neverbalne komunikacje, naročito poremećaj u razvoju govora, bizarnosti u ponašanju i stereotipije.

Poremećaji autističnog spekta su etiološki različita grupa poremećaja koju povezuje slična klinička slika. Obuhvata nekoliko neurorazvojnih poremećaja u okviru kojih postoje značajna odstupanja:
- u socijalnom razvoju,
- razvoju socijalnih veština i
- neobična ponašanja i interesovanja.

U ovu grupu poremećaja ubrajaju se:
1. Autistični poremećaj, F84.0,
2. Rettov poremećaj, F84.2,
3. Dezintegrativni poremećaj, F84.3,
4. Aspergerov poremećaj, F84.5,
5. Pervazivni razvojni poremećaj neodređen, uključujući i atipični autizam, F84.9.

Brojni faktori se dovode u vezu sa nastankom ASD, za mnoge je utvrđena i korelacija, ali nema dokazane uzročno-posledične veze koja bi jedan ili nekoliko faktora izdvojila kao osnovne etiološke faktore.

Autistični poremećaj je globalni razvojni poremećaj koji počinje u ranom detinjstvu i najčešće traje tokom celog života. U proteklih 50 godina, učestalost autizma se povećala čak 15 puta. U svetskoj populaciji pojavljuje se u 0,2%. Incidencija autizma se kreće od 2-5:10000, i mnogo je češća kod dečaka (4:1) [1,2,3,4]. S obzirom na sve veću prevalenciju ASD, dečji stomatolozi su u prilici da se sve češće susreću sa ovim pacijentima u stomatološkim ordinacijama. Sama stomatološka intervencija, koju je neophodno sprovesti kod dece sa ASD, može biti jako komplikovana zbog nesaradnje pacijenata. Osim toga, roditelji ove dece su jako obazrivi i zahtevaju dodatna objašnjenja od stomatologa vezana za materijal koji će se koristititi u restaurativnim procedurama, zbog sumnje u toksičnost amalgama i fluorida [5].

Introduction

Autism spectrum disorders (ASD) are biological developmental disorders of the human brain, very complex due to their origin and diverse manifestations. An autistic disorder is a pervasive disorder beginning in early childhood. The most obvious symptoms of the condition are the lack of emotional response to environmental stimuli – people, material world and events around them, absence of both verbal and non-verbal communication, speech development disorders, bizarre behaviors and stereotypes of autism.

Autism spectrum disorders include a number of etiologically diverse disorders sharing a similar clinical picture. These involve several neurodevelopmental disorders characterized by marked deviations in the following elements:
• social development
• development of social skills and
• behavior and interests

The following disorders are classified as ASDs:
1. autistic disorder, F84.0
2. rett syndrome, F84.2
3. childhood disintegrative disorder, F84.3
4. asperger syndrome, F84.5
5. pervasive developmental disorder not otherwise specified, including atypical autism as well, F84.9.

A multitude of factors have been associated with the development of ASD, a number of them even correlated, but the cause-and-effect relationship (that would single out one or several factors as the principal etiological factors) could not be established.

Autistic disorder is a global developmental disorder with the onset in early childhood that usually lasts a lifetime. Over the last 50 years, the prevalence of autism has increased as much as 15 times. It occurs in 0.2% of the world population, The incidence of autism ranges from 2-5:10.000 (with a male-to-female ratio of 4:1)[1,2,3,4] . In view of the rising prevalence of ASD, pediatric dentists more often treat such children in their clinics. The dental intervention itself, when required in children with ASD, can be very complicated due to a lack of compliance by such patients. Moreover, the parents of children with ASD are very cautious and often ask for additional explanations from the dentists related to the materials to be used in restorative procedures, expressing their doubts and uncertainties regarding the toxicity of amalgams and fluorides[5].

Zbog toga je neophodno da se razvije dobar, iskren odnos sa roditeljima, kako bi prihvatili preporučene stomatološke intervencije. Osim toga, pojedina deca sa ASD prenaglašeno reaguju na specifične zvuke, svetlost, miris, dodir, a sve to je neizostavni deo stomatološke intervencije. Zbog toga je i prva poseta stomatološkoj ambulanti veoma važna, jer od prvog kontakta može umnogome zavisiti da li će se buduća saradnja sa stomatologom odvijati u pozitivnom ili negativnom pravcu. Prvim stomatološkim pregledom se često može ustanoviti da li će se potrebni stomatološki tretman moći da obaviti u ordinaciji, ili će biti potrebna primena sedacije ili opšte anestezije.

Ponašanje dece sa ASD u stomatološkoj ordinaciji

Dolazak deteta sa ASD u stomatološku ordinaciju može biti jako traumatičan za samog pacijenta i roditelja, ali isto tako i naporan za stomatologa. Baš iz tog razloga, kao i zbog neblagovremenog dolaska, ekstrakcije zuba su najčešće intervencije kod ove dece. Deca sa ASD su u velikom procentu nesaradljiva, često pokazuju hiperaktivnost, napetost, kratko vreme pažnje i uznemirenost. Repetitivno ponašanje, nepredvidivo i nekontrolisano pomeranje tela takođe mogu da komplikuju samu intervenciju, ali i da ugroze sigurnost, kako pacijenta tako i stomatologa i stomatološkog osoblja. Svaka promena u njihovoj rutini može da predstavlja veliki problem i da dovede do paničnih napada. U takvom stanju, oštro zabranjuju pristup usnoj duplji, odupiru se fizičkom savlađivanju i destruktivno se ponašaju prema okolini. Ovakvo ponašanje predstavlja najveću prepreku dečjem stomatologu u pružanji intervencije.

Oralno zdravlje dece sa ASD

Poremećaj autističnog spektra sam po sebi nema nikakav uticaj na oralno zdravlje obolele dece. Prevalencija karijesa kod dece sa ASD je predmet brojnih istraživanja. Podaci iz literature su dosta kontradiktorni. Dok neki autori ukazuju da je prevalencija karijesa kod dece sa ASD veća nego kod zdrave dece, drugi, pak, svojim istraživanjem potvrđuju da nema bitne razlike u prevalenciji karijesa [6,7,8,9]. Takođe, utvrđena je visoka korelacija između brige o obolelom detetu i oralnog zdravlja. To znači da oboleli čiji su roditelji upoznati sa prirodom bolesti njihovog deteta i samim tim pronašli odgovarajući način za kvalitetno i redovno održavanje oralne higijene, imaju manju prevalenciju karijesa i bolje oralno zdravlje [10].

It is therefore of paramount importance to develop an adequate, open and sincere relationship with the parents, so that they can consent to the suggested dental procedure. In addition, some children with ASD tend to react excessively to specific sounds, lighting, smell, touch, and these are all integral parts of a dental intervention. The first visit to a pediatric dentist is therefore very important – the first contact can largely influence further cooperation and determine its development in both a negative and positive direction. The first dental examination will often determine whether the required treatment can be done in the dental clinic, or a sedation or general anesthesia will be necessary.

Behavior of children with ASD in a dental office

Any visit of a child with ASD to a dental office can be very traumatic for both the patient and his parent, but sometimes equally arduous for the dentist. For exactly these reasons and too late visit to a dentist, dental extractions are the most common interventions in these children. Children with ASD are mostly non-compliant, often hyperactive, tense, unattentive, and highly agitated. Repetitive behaviors, unpredictable and uncontrolled movements of the body, additionally complicate the required intervention, but can also affect the safety of both the patient himself and dentist or those who assist in the procedure. Any change in the routine of such children can pose a huge problem and cause panic attacks. In such a state, the children refuse to allow any access to their oral cavity, they fiercely resist any physical restraint attempt and are often destructive to the immediate environment. Such a behavior is the greatest obstacle to a pediatric dentist trying to treat these patients.

Oral health in children with ASD

Autism spectrum disorders by itself do not have any impact on the oral health of affected children. The prevalence of caries among the children with ASD has been extensively studied. The literature date are rather inconsistent. While some authors report a higher prevalence of caries in ASD children compared to their healthy peers, others state that there is not any significant difference in the prevalence of caries between these groups [6,7,8,9]. In addition, a strong correlation has been established between the general care for the affected child and its oral health.

Samo ponašanje dece sa ASD može bitno uticati na zdravlje njihovih usta i zuba. Zbog neprihvatanja održavanja oralne higijene, u usnoj duplji se nagomilava dentalni biofilm, koji dovodi do karijesa, njegovih komplikacija i do nastanka gingivoparodontalnih oboljenja. Ortodontske nepravilnosti su takođe prisutne kod dece sa ASD, a najčešće su obrnuti preklop, ukršteni zagrižaj i II klasa po Angleu[11] .

Kao posledica smanjene salivacije, do koje dolazi usled primene pojedinih medikamenata koji se koriste u terapiji ASD (antipsihotici i anksiolitici), i nagomilavanja dentalnog biofilma, prevalencija heilitisa i gingivoparodontalnih oboljenja je velika[12].

Zbog smanjenog osećaja na bolni nadražaj, naspecifičnog odgovora i poremećaja u registrovanju osećaja u usnoj duplji, kod dece sa ASD često dolazi i do oralnog samopovređivanja. Oralno samopovređivanje uključuje autoekstrakciju zuba (najčešće mlečnih), ugrize jezika, usana, obraza, a takođe i mehaničko povređivanje čitave oralne sluzokože[12,13,14]. Izazivanjem takvih povreda, autistično dete skreće pažnju na sebe i izaziva neku svoju želju ili potrebu. Oralno samopovređivanje je kompleksan problem, u čijem lečenju, pored dečjeg stomatologa, treba uključiti psihologa i psihijatra. Za rešavanje takvih situacija ne postoje univerzalna rešenja, već se svaki slučaj treba posmatrati izolovano, uz što bolje razumevanje odnosa unutar porodice, kao i uz obavezno uspostavljanje poverenja i među terapeuta i pacijenta.

Preventiva, profilaksa i terapija oboljenja usta i zuba kod dece sa ASD

Preventivne, profilaktičke i terapijske mere za očuvanje oralnog zdravlja koje se primenjuju kod dece sa autizmom ne razlikuju se bitno od preventivnih i profilaktičkih mera koje se preporučuju zdravoj deci. To su, pre svega, pravilno i redovno održavanje oralne higijene, saveti o ishrani, primena preparata sa fluoridima i zalivanje fisura, kao i redovni pregledi kod stomatologa. Razlika je u tome što je za sprovođenje ovih mera kod dece sa autizmom potrebno mnogo više vremena, strpljenja i pažnje.

S obzirom da autistična deca teško prihvataju promene, edukacija o održavanju oralne higijene je često mukotrpna i dugotrajna. Svaku promenu treba postepeno uvoditi, kako bi pojedine radnje dete uvrstilo u svoju rutinu.

This means that the children, whose parents are well informed about the nature of their disease and have found an appropriate way to assure a high level of quality and regular oral hygiene of their children, have lower caries prevalence rates and better overall oral health [10].

The behavior of children with ASD can have a marked impact on the health of their mouth and teeth. Poor compliance in the maintenance of oral hygiene leads to the accumulation or dental biofilm, with subsequent development of caries and its complications, as well as gingival-periodontal diseases. Orthodontic irregularities are also present in children with ASD, with reverse overlaps, crossbites, and Angle Class II malocclusions being the most common[11].

As the consequence of reduced salivation (caused by some of the medicaments used to treat ASD – antipsychotic and anxiolytic drugs), and dental biofilm accumulation, the prevalence of cheilitis and gingival-periodontal diseases is rather high[12].

Self-inflicted oral injuries are common in children with ASD due to their reduced pain sensation, non-specific responses, and oral cavity perceptual disorders. Self-inflicted oral injuries involve autoextraction of teeth (most commonly primary teeth), tongue bites, lip and cheek bites, and mechanical injuries of the oral mucosa as a whole [12,13,14]. By the infliction of such injuries, a child with ASD commonly draws attention, and expresses a need or a wish. Self-inflicted oral injuries are a complex problem, the management of which should generally involve, in addition to a pediatric dentist, a psychologist or a psychiatrist. There is not any universally recognized therapy for the situations such as these – each case should be considered individually, with an adequate understanding of the interfamily relationships and trust-building between the child and its therapist.

Prevention, prophylaxis, and therapy of dental and oral cavity diseases in children with ASD

Preventive and prophylactic and therapeutic measures in the maintenance of oral health in autistic children are not very much different from those recommended for their healthy peers. They consist of proper and regular maintenance of oral hygiene, nutrition advice, use of fluoride preparation and fissure sealing, as well as regular dental appointments.

Ovo podrazumeva savete roditeljima koji moraju sarađivati sa stomatologom, jer bez te saradnje neće biti ni uspeha. Četkanje zuba treba započeti igrom. Detetu se daje četkica koju će koristiti van kupatila. Kada prihvati ovo, dete se uvodi u kupatilo, zatim se postepeno dodaje i pasta za zube, pa četkanje zuba uz pomoć roditelja. Ovaj postupak može trajati nedeljama, ali će na kraju dovesti do značajnih rezultata kada dete samo pere zube. Naravno, nikako se ne smeju izostaviti pohvale i odobravanja za svaki korak i dobro ponašanje [15,16].

U prevenciji karijesa ishrana ima značajno mesto. Primećeno je da je ishrana bogata ugljenim hidratima sastavni deo svakodnevne ishrane, a često predstavlja i vrstu nagrade detetu sa ASD koje je uspešno obavilo neki postavljeni zadatak. Ovaj sistem nagrađivanja, pogotovo ako se daje između obroka, može značajno uticati na povećanje prevalencije karijesa. Zbog toga, pravilna (nekariogena) ishrana mora biti važan faktor u edukaciji i obuci roditelja dece sa ASD. Roditelje treba upozoriti na štetnost zaslađene hrane i sugerisati im da slatkiše deci daju uz glavni obrok. Osim toga, usmene savete o ishrani treba obavezno završiti davanjem pisanih beležaka, koje će poslužiti kao podsetnik kod kuće.

Princip stomatološkog zbrinjavanja u prvi plan stavlja eliminaciju bola i sprečavanje uticaja oralnih oboljenja na opšte zdravlje. Ovaj nivo stomatološke zaštite je standardan (uobičajen), jer priroda samog oboljenja i socijalno okruženje onemogućavaju složenije stomatološke intervencije, zbog čega su i indikacije za ekstrakcije zuba proširene.

Kako bi se izbegla traumatična i kontraproduktivna iskustva, posete stomatologu treba uvrstiti u navike autistične dece. Naime, preporučuje se dovođenje deteta u stomatološku ordinaciju jednom nedeljno, kako bi se postepeno naviklo na ambijent, stomatološko osoblje, zvukove i mirise. Što se ranije krene sa procesom navikavanja, efekat je brži i bolji [17,18]. Deca sa ASD imaju izražene vizuelne sposobnosti i mnoga od njih bolje razumeju pisanu poruku ili poruku putem slike. U poslednje vreme prisutni su brojni projekti koji pokušavaju da pripreme dete na vizuelnu komunikaciju putem slika umesto reči. U te svrhe koriste se knjige sa različitim slikama na kojima je prikazano šta od autističnog deteta stomatolog očekuje. Nakon18 meseci od započinjanja projekta deca

The principal difference is contained in the fact that these measures in autistic children require much more time, patience, and attention.

In view of the fact that autistic children do not accept changes easily, education about their oral hygiene is not easy to perform and requires considerable time and efforts. Each change should be introduced step-by-step, so that the child should gradually accept it and integrate it into its own routine. This involves parent counseling as well, who have to collaborate closely with the dentist, since success cannot be guaranteed otherwise. Tooth brushing, for instance, should be introduced in the form of a game. A child is given a toothbrush to use it outside the bathroom. When the child accepts it as an object, the game is repeated in the bathroom; a toothpaste is then introduced, and after that the proper tooth brushing with parental assistance. The procedure may last for weeks, but will eventually produce a significant result – the child will brush its teeth all by itself. Expressions of approval and awards must not be forgotten in the process for each successful step and desirable behaviors [15, 16].

In the prevention of caries, nutrition has a marked place. It has been noted that carbohydrate-rich foods constitute a significant portion of everyday nutrition, being even a kind of reward for a child with ASD for a successfully accomplished task. Such a reward system, especially between the meals, can have a significant impact on the higher prevalence of caries. Proper (non-cariogenic) nutrition should become an important element in the education and training of parents with ASD children. Parents should be warned of the adverse effects of sugar foods and advised to give sweets to their children with one of the main meals. Furthermore, oral advice should always be supported with written information to the parents (to serve as a reminder at home).

The principle of dental care primarily focuses on the elimination of pain and aims to prevent the impact of oral diseases on general health. This level of dental care is a standard one (usual), since the nature of the disease and aspects of social environment make more complex interventions unfeasible, broadening therefore the field of indications for tooth extraction.

In order to avoid traumatic and counterproductive experiences, dental appointments should become an integral part of the routine of an autistic child. Dental appointments once a week are thus recommended, so that the child gets used to the den-

su u stomatološkoj ordinaciji sarađivala, odnosno sedela u stomatološkoj stolici i široko otvarala usta. Najveći broj dece je čak i dozvoljavao pregled ogledalcem, lokalnu aplikaciju fluorida i mašinsko uklanjanje naslaga sa zuba. Prosečan broj poseta da bi se ovo postiglo je bio oko četiri. Za decu sa ASD, vizuelna pedagogija je jedan od načina da se sprovede stomatološka nega i postigne bolje oralno zdravlje i kvalitetnije življenje [19].

Ponašanje i nesaradnja deteta sa ASD u stomatološkoj odrinaciji je glavna prepreka u pružanju stomatoloških intervencija. Kod nekih se metoda „kaži-pokaži-uradi“ pokazala kao veoma uspešna, dok je kod drugih (naročito kada je verbalna komunikacija otežana) uspeh izostao [20,21]. Zato je u slučajevima kada je nemoguće uspostaviti saradnju indikovano da se stomatološke terapijske procedure obave u opštoj anesteziji [22,23]. Tada se u jednoj seansi uklanjaju meke i čvrste naslage sa zuba, sanira karijes, zalivaju fisure i na kraju ekstrahiraju zubi koje nije moguće sanirati.

Zaključak

Deca sa ASD zaslužuju i trebalo bi da imaju dobro oralno zdravlje. Put do zdravih usta i zuba je dug i mukotrpan, ali uz veliku upornost i strpljenje roditelja i dečjeg stomatologa nije neostvariv i nemoguć. Važan zadatak dečjeg stomatologa je da se zdravlje dece sa ASD što više približi onome kod zdrave dece, pri čemu treba voditi računa da bazu prevencije predstavlja zdravstveno − vaspitni rad, koji treba da bude tako koncipiran da maksimalno motiviše i uključi roditelje i decu u borbu za zdrava usta i zube.

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tal clinic environment, personnel, sounds, and smells. The effect is even better if the process of accommodation is started early during the life of an autistic child [17, 18]. Children with ASD often have excellent visual abilities and many of them understand better written or pictorial than verbal information. Recently, numerous projects have been initiated trying to prepare autistic children for visual (pictorial) instead of verbal communication. Various books have been used with pictures, trying to explain what is the expectation of a dentist from an autistic child. After 18 months of the project, children were able to cooperate to a certain degree, i.e. to sit in the dental chair and open their mouth widely. Most of the children even consented to dental mirror visual examination, local fluoride application, and ultrasound dental plaque removal. The average number of appointments to achieve this was around four. For children with ASD, visual pedagogy is one of the ways to administer dental care and achieve better oral health and quality of life [19].

Behavior and non-compliance of children with ASD in dental clinics is the main obstacle in their adequate dental care. In some of them, the method „tell-show-do“ has been very successful, while in others (especially in the cases with difficult verbal communication) it has not[20,21]. In the cases in which cooperation cannot be established, therapeutic dental procedures should be done under the general anesthesia[22,23]. In a single instance, soft and hard dental accumulations can thus be removed, caries can be treated, fissures can be sealed, and dental extractions, if needed, can be accomplished.

Conclusion

Children with ASD certainly deserve and should good oral health. The road to success is a long and rocky one, but with patience and perseverance of both the parents and pediatric dentist, the success is at hand. Pediatric dentists should strive to improve the oral health of children with ASD and bring it as close as possible to the level reached in healthy children, taking care that the basis of prevention is in fact health education targeted to adequately motivate and involve both the parents and their children in the fight for healthy oral cavity and teeth.

Conflict of interest

The authors have no any financial benefit or conflict of interests.

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Ljubazno molimo autore da pažljivo pročitaju sledeće informacije o pripremi rada i podnošenju istog za štampanje. Radovi koji nisu napisani u skladu sa ovim instrukcijama biće vraćeni autorima sa zahtevom da isprave korekcije pre slanja istog na recenziju. Odbijeni radovi se ne vraćaju sem slika.

UREĐIVAČKA POLITIKA

Časopis publikuje uvodnik, originalne naučne ili stručne radove, klinički relevantne studije, preglede, prikaz slučaja, preliminarna saopštenja, tehničke inovacije, pisma uredniku, članke iz moderne literature, izveštaj o knjigama, novosti i izveštaje sa nacionalnih i internacionalnih kongresa, simpozijuma i ostalih aktuelnih sastanaka, koji nisu prethodno publikovani ili predati za publikovanje na nekom drugom mestu. Svi primljeni radovi biće recenzirani od dva anonimna recenzenta, i kada je to potrebno od statističara. Autori će biti obavešteni o prijemu, odbijanju, ili potrebnoj reviziji za najkasnije 6 nedelja od podnošenja rada. Radovi se ne plaćaju.

JEZIK

Svi predati radovi za štampanje moraju biti napisani na srpskom i engleskom jeziku. Apstrakti treba da budu pripremljeni pored srpskog i na preciznom i gramatički ispravnom engleskom jeziku (US engleski stil) (videti niže). Izbegavati korišćenje latinskih izraza; ako su potrebni staviti ih u zagrade.

ETIKA

Kada se radi o eksperimentima na humanom materijalu ili pacijentima, ukazati da li je primenjeni postupak u skladu sa etičkim standardima odgovornog komiteta za ljudske eksperimente ili sa Deklaracijom iz Helsinkija (1964, amandmani iz 1975 i 1983) Svetske medicinske asocijacije.

GENERALNE INSTRUKCIJE

PRIPREMA RADA

Radovi treba da budu napisani na A4 formatu sa duplim proredom, obezbeđujući 25 mm margine. Samo jedna kopija rada treba da sadrži prezime i prvo slovo autorovog imena u gornjem desnom uglu. Broj stranica rada počinje sa naslovnom stranom kao strana 1 i nastavlja se sa ređanjem.

NASLOVNA STRANA

Gornji deo naslovne strane treba da sadrži: a) puni naslov rada (velikim slovima), b) puna imena (prvo ime, srednje slovo ako je primenljivo i poslednje ime) svih autora bez akademskih titula, c) nazivi institucija i d) radni naslov od ne više od 10 reči. Na dnu naslovne strane molimo da ukažete na ime autora odgovornog za korespondenciju, sa akademskim zvanjem, poštanskom adresom, telefonskim i fax brojevima i E-mail adresom.

Sledeća strana počinje samo sa naslovom, i dalje se nastavlja sa tekstom. Tekst treba da bude podeljen u delove sa naslovima: uvod, pacijenti/materijal i metod rada, rezultati, diskusija, zaključci, zahvalnost i literatura. Za tabele, figure (slike) i legende vidi deo Tabele I Figure.

Poželjno je da se koriste reči prikladne za indeksiranje i pretraživanje. Ako takvih reči nema u naslovu, poželjno je da se naslovu doda podnaslov.

Ako je članak u prethodnoj verziji bio izložen na skupu u vidu usmenog saopštenja (pod istim ili sličnim naslovom) podatak o tome treba da bude naveden u posebnoj napomeni pri dnu prve strane članka.

APSTRAKT I KLJUČNE REČI

Originalni radovi moraju da sadrže strukturni apstrakt od 250 reči, podeljenih na sledeća 4 paragrafa:

Uvod: opisuje problem o kome se radi u radu

Materijali i metode: opisuje kako je istraživanje sprovedeno

Rezultati: opisuje primarno rezultate

Zaključak(ci): saopštenje autora o zaključcima proisteklim iz rezultata, i implicira njihovu kliničku primenljivost.

Strukturni apstrakti nisu potrebni kod uvodnika i pisma. Ispod apstrakta stoje ključne reči i to tri do pet. Ključne reči mogu biti uzete samo iz Medical Subjects Headings (MeSH).

Apstrakt treba da bude preveden i na engleski jezik (US style), sa naslovom, imenima autora, institucija i ključnim rečima.

TABELE I FIGURE

Svaka tabela sa jasnim naslovom na srpskom i engleskom treba da bude otkucana sa duplim proredom na odvojenom papiru. Obeležiti brojevima tabele jednu za drugom kako nailaze posle prvog navođenja u tekstu (obeležavaju se arapskim brojevima). Dati svakoj kolumni kratko ili skraćeno zaglavlje. Staviti objašnjenja u legendama svih nestandardnih skraćenica korišćenih u tabeli. Za jedinice i merenja vidi odeljak niže. Ne koristiti unutrašnje horizontalne i vertikalne linije. Staviti sve tabele na kraju vašeg fajla. Uvek odvojiti posebne kolumne upotrebom tabulatora, a ne upotrebom razmaknice, tabele moraju biti u tekst formatu.

Linijski prikazani dijagrami i ilustracije (fotografije, fotomikrografije itd.), trebaju biti osmišljene kao figure. Oni takođe treba da budu smešteni na odvojenom listu papira i numerisani jedan za drugim arapskim brojevima u saglasnosti sa prvim koji je citiran u tekstu. Figure treba da budu profesionalno nacrtane i fotografisane. Svaka figura treba da bude etiketirana pozadi ukazujući broj figure, prezime i prvo slovo imena autora, i vrh figure. Fotografije treba da se daju u dva primerka. Kolor fotografije ce se štampati samo u dogovoru sa urednikom ili ako autor sam snosi troškove. Fotomikrografije moraju imati obeleženu unutrašnju razmeru, i simbole, i strelice ili slova treba da su u kontrastu sa pozadinom. Na fotografijama pacijenata mora se sakriti identitet, osim ako se pacijenti u pismenoj formi slože sa objavljivanjem njihovih fotografija sa identitetom. Ukoliko ste pozajmili ili već publikovali negde fotografije priložite i pismenu dozvolu za reprodukovanje. Naslovi i detaljna objašnjenja fotografija treba da budu data u legendama. Ako su korišćeni simboli, strelice, brojevi ili slova za identifikaciju delova slike objasniti svaku jasno u legendi.

ZAHVALNOSTI

Priznanja i zahvalnosti prethode literaturi specificirajući generalnu podršku kao i odeljenje i ime šefa odeljenja, priznanja tehničkoj pomoći i konačno finansijskoj i materijalnoj pomoći. Navesti naziv i broj projekta, odnosno naziv programa u okviru koga je nastao članak i naziv institucije koja je finansirala projekat, u posebnoj napomeni pri dnu prve strane članka

LITERATURA

Autori su odgovorni za tačnost literaturnih podataka. Reference treba da budu na posebnom listu i delu odmah iza teksta. Samo reference bitne za studiju mogu biti citirane. Kada je citiranje literature neophodno primeniti Vankuver stil. Na posebnom listu se navode citati referenci koji su označeni rednim brojevima po redosledu u kome se pojavljuju u tekstu i svaki citat odgovara brojevima koji sadrži navedenu referencu. Primeri tačnih oblika referenci :

RADOVI U ČASOPISIMA

1. Standardni članak u časopisu (lista svih autora, ali ako je broj veći od šest citirati tri i dodati et al): Glass DA, Mellonig JT, Towle HJ. Histologic evaluation of bone inductive proteins complexed with coralline hydroxyapatite in an extraskeletal site of the rat. J Periodontol 1989; 60:121–125.

2. Organizacija kao autor: Federation Dentaire Internationale. Technical Report No. 28. Guidelines for antibiotic prophylaxis of infective endocarditis for dental patients with cardiovascular disease. Int Dent J 1987;37:235.

3. Nije dat autor: Coffee drinking and cancer of the pancreas (editorial).BMJ 1981;283:628

4. Volumen sa suplementom: Magni R, Rossoni G, Berti R, BN52021 protect guinea pig from heart anaohylaxis. Pharmacol Res Commun 1988; 20 Suppl 5:75–8.

Knjige ili druge monografije

5. Lični autor (i): Tullman JJ, Redding SW. Systemic Disease in Dental Treatment. St.Louis: The CV Mosby Company;1983:1–5.

6. Poglavlje u knjizi: Rees TD. Dental management of the medically compromised patient. In: McDonald RE, Hurt WC,Gilmore HW, Middleton RA, eds.Current Therapy in Dentistry, vol.7. St. Louis: The CV Mosby Company; 1980:3–7.

7. Disertacije i teze: Teerakapong A. Langerhans Cells in human periodontally healthy and diseased gingiva. (Thesis). Houston, TX: University of Texas; 1987.92 p.

Ostali publikovani materijal

8. Novinski članak: Shaffer RA.Advances in chemistry are starting to unlock mysteries of the brain. The Washington Post 1989 Ang 7; Sect. A:2 (col. 5).

Reference-elektronski citati

9. On line časopisi bez podataka o volumenu i strani. Berlin JA , Antman EM. Advantages and limitations of metaanalytic regressions of clinical trials data. Online J Curr Clin Trials (serial online). June 4;doc 134. Accessed July 20, 2000.

10. Online časopisi sa podacima o volumenu i strani. Fowler EB, Breault LG. Ridge augmentation with a folded acellular dermal matrix allograft: A case Report. J Contemp Dent Pract (serial online). 2001;2(3):31–40. Available from: Procter&Gamble Company, Cincinnat, OH. Accessed December 15, 2001.

11. World Wide Web.Centers for Disease Control and Prevention. Preventing emerging infectious diseases: Addressing the problem of antimicrobial resistance. Available at: http://www.cdc.gov/ncidod/emergplan/antiresist/. Accessed November 5, 2001.

JEDINICE MERE

Sva merenja treba da budu izražena u terminima Internacionalnog Sistema Jedinica (Si).

SKRAĆENICE I SIMBOLI

Ako se koriste nestandardne skraćenice potrebno je prilikom prvog korišćenja celog izraza u tekstu dati njegov puni naziv, a zatim u daljem tekstu koristiti skraćenicu. Nazivi simptoma, znakova i bolesti, kao i anatomski i histološki detalji ne mogu se skraćivati.

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Korespondirajući autori svih tipova radova izuzev pisama, novosti i pregleda knjiga primiće 1 broj časopisa oslobođena plaćanja.

SIMBOLI ZA OZNAČAVANJE (FUSNOTE)

Mogu se koristiti samo za identifikaciju zapošljenja autora, za objašnjenje simbola u tabelama i ilustracijama itd. Koristite sledeće fusnote: *,&, #,**, itd.

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Poslati 3 kopije rada i elektronsku verziju (CD-ROM, E-mail). Kopije rada i sav sadržaj treba spakovati u tvrdu kovertu kako bi se sprečilo ostećenje za vreme poštanskog saobraćaja. Radovi moraju biti potkrepljeni sa zatvorenim pismom potpisanim od svih autora. Ono mora da sadrži: a) izjavu da je rad pročitan i odobren od svih autora; b) informaciju o prethodnoj ili dupliciranoj publikaciji ili davanju rada na drugom mestu ili nekog njenog dela ranije; c) izjavu o finansijskim ili drugim vezama koje mogu dovesti do sukoba interesa; d) ime, adresu i broj telefona autora za korespondenciju koji je odgovoran za komunikaciju i korespondenciju; e) izjavu da su klinička i eksperimentalna istraživanja sprovedena u skladu sa institucijskim etičkim komitetom ili sa Helsinškom deklaracijom. Sem ovoga, pismo treba da sadrži i obaveštenje o vrsti rada i da li autori plaćaju ekstra cenu za kolor reprodukcije.

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Sekretari: Prof. dr Saša Stanković, Mr. sci dr Miloš Tijanić

Klinika za Stomatologiju

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Predavanje materijala direktno uredniku ili bilo kom članu uređivačkog odbora otežaće i odužiće proces recenzije i prijema rada za štampanje.

TEHNIČKE INSTRUKCIJE ZA ELEKTRONSKO SLANJE RADOVA

Skladištenje informacije: CD-ROM u Windows XP ili veći format. Software: radovi na disku treba da budu u Word-u za Windows. Etiketa: Napišite prvo ime autora na nalepnici CD-a, zajedno sa imenom i verzijom korišćenog word procesora. Označiti sve CD sadržajem figura, dijagrama itd, sa imenom prvog autora, imenom fajla, formatom i sabijenim šemama ako su korišćeni. Fajlovi: priložiti tekst i tabele svakog rada kao pojedinačni fajl, ali stavite sve figure, grafikone itd., u odvojenim fajlovima. Dozvoljeni grafički formati su EPS i TIF. Veličina figura treba da bude 8,5 cm ili 18,0 cm u rezoluciji od minimalno 300 dpi. Molimo Vas da pošaljete originalne fotografije, ne šaljite fotokopije. Format: unosite svoj tekst bespreKidno, samo umetnuti hard return na kraju paragrafa ili poglavlja, podnaslova, lista itd. Ne upotrebljavajte softwareski plan stranica. Molimo Vas da koristite Times New Roman 12 font za Word za Windows. Neku reč ili frazu u tekstu koju želite da izdvojite označite kroz rad u italic pismu. Boldirajte ono što se koristi uzastopno u tekstu za određene matematičke simbole, na primer, vektori. Molimo da proverite disk na virus i verifikujte da on sadrži ispravan fajl.

PODNOŠENJE REVIDIRANIH ČLANAKA

Autori mogu predati svoje revidirane radove uključujući tabele i figure na CD-u sa PC ili Mac fajlom. Vratiti revidirane radove sa celokupnim materijalom na istu adresu sekretarijata.

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Acta Stomatologica Naissi is a scientific journal of the University of Niš, Faculty of Medicine and Clinic of Stomatology, which publishes articles relevant to the science and practice of Dentistry in general and related areas.

Please read carefully the following instructions to authors prior to manuscript preparation and submission. Papers which are not prepared according to the propositions and instructions will be returned to authors for corrections before forwarding them to reviewers. In case of unacceptable articles only illustrations will be returned.

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Acta Stomatologica Naissi publishes editorials, original scientific or clinical articles, review articles, preliminary reports, case reports, technical innovations, letters to the editor, articles from up-to-date literature, book reviews, reports and presentations from national and international congresses and symposiums which have not been previously submitted for publication elsewhere. All submitted articles will be reviewed by at least 2 reviewers, and when appropriate, by a statistical reviewer. Authors will be notified of acceptance, rejection, or need for revision within 6 weeks of submission. Articles are not paid for.

LANGUAGE

All submitted articles should be written in bilingual (Serbian and English) language. Abstracts should be written in Serbian and precise and grammatically correct English language, preferably US English. Avoid using Latin terms; however if necessary, put them in parentheses.

ETHICS

When reporting experiments on human subjects, indicate whether the procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional or regional) or with the Helsinki Declaration (1964, amended in 1975 and 1983) of the World Medical Association.

GENERAL INSTRUCTIONS

PREPARATION

Articles should be written on A4white bond paper size (21x 29.5cm) on one side of the paper only, and double-spaced (including illustration legends and references) providing 25 mm ample margins all around. Only one copy of the manuscript should contain the surname and the author's first name initial in the upper right corner. Manuscripts should be organized as follows: Title Page, Abstract and Key words, Introduction, Patients/Materials and Methods, Results, Discussion, Conclusions, Acknowledgments, References, Figure Legends, Tables, Figures. Title page is numbered as page 1, and all other pages should be numbered conse-quently.

TITLE PAGE

The title page should contain: a) the full title of the article (in upper case); b) first name, middle initial, and last name of each author without the academic degree; c) name of department and institutional affiliation for each author; d) running title of no more than 10 characters. At the bottom of the page, please indicate the name, academic degree and address (including E-mail, telephone and fax number) of the author responsible for correspondence.

It is recommendable to use the words appropriate for indexing and searching. If there are not such words in the title, then subtitle should be added.

If the article in the previous version has been orally exposed (under the same or similar title), such information should be separately noted at the bottom of the first page of the article.

Abstract and Key words

All original abstracts should be submitted with a structured abstract, consisting of no more than 250 words, and the following 4 paragraphs:

Background: Describes the problem being addressed.

Material and Methods: Describes how the study was performed.

Results: Describes the primary results.

Conclusion: Reports what authors have concluded from these results, and notes their clinical implications.

Key words: A maximum of 5 key words drawn from MeSH documentation. Abstract should be translated into English (US style), with the title, name(s) of author(s), institutional affiliation and key words.

TABLES AND FIGURES

Each table with a brief title (on Serbian and English) should be typed double-spaced on a separate sheet of paper. Number tables consecutively (with Arabic numbers) in the order of their first citation in the text. Give each column a short or abbreviated heading. Place explanations in legends of all nonstandard abbreviations which are used in table. For units and measurements see paragraph below. Do not use internal horizontal and vertical rules. Place all tables at the end of your file. Always separate the individual columns using tabulators, not using space bar, i.e. tables must be in text format. Line drawings diagrams and halftone illustrations (photographs, photomicrographs, etc.) should be designated as figures. They should be listed on separate sheet and numbered consecutively with Arabic numerals according to the order in which they have been first cited in the text. Figures should be professionally drawn (not simply typewritten) and photographed. Each figure should be labeled on its back indicated the number of the figure, last name and the first letter of the author, and the topside of the figure. Photographs should be supplied in two copies. Color photographs are published only in case if author himself bears expenses. Photomicrographs must have internal scale markers, and symbols, arrows or letters should contrast with the background. Photographs of patients must conceal their identity unless patients approve the publishing of the photograph in written form. If you borrow or use already published photographs please submit a written permission for reproduction. Permission is not required for the documents in the public domain. Figures will not be returned unless requested. Captions and detailed explanations of the figures should be given in the legends. If symbols, arrows, numbers, or letters are used to identify parts of the figure identity and explain each one clearly in the legend.

ACKNOWLEDGEMENTS

Acknowledgements are positioned before the reference list specifying general support by department chairman, acknowledgements of technical as well as financial and material support. Acknowledgement includes the title and number of the project, i.e. the title of the programme within which the article was composed and the title of the institution funding the project; it should be written as a separate notification at the bottom of the first page of the article.

REFERENCES

Authors are responsible for accuracy of literature data. References should be listed in a separate section immediately following the text. Only references important for the study should be cited. It is necessary to apply Vancouver style. Citations are numbered consecutively in the order in which they appear in the text and each citation corresponds to a numbered reference containing publication information about the source cited in the reference list at the end of the publication. Examples of references are given bellow:

Journals:

1. Standard journal reference. (Note: list all authors if six or less; when seven or more, list only first three and add et al): Glass DA, Mellonig JT, Towle HJ. Histologic evaluation of bone inductive proteins complexed with coralline hydroxyapatite in an extraskeletal site of the rat. J Periodontol 1989;60:121–125.

2. Corporate author: Federation Dentaire Internationale. Technical Report No.28. Guidelines for antibiotic prophylaxis of infective endocarditis for dental patients with cardiovascular disease. Int Dent J 1987;37:235.

3. No author given: Coffee drinking and cancer of the pancreas (editorial). BMJ 1981;283:628

4. Volume with supplement: Magni R, Rossoni G, Berti R, BN52021 protect guinea pig from heart anaphylaxis. Pharmacol Res Commun 1988; 20 Suppl 5:75–8.

Books or other monographs:

5. Personal author(s): Tullman JJ, Redding SW. Systemic Disease in Dental Treatment. St. Louis: The CV Mosby Company; 1983:1–5.

6. Chapter in a book: Rees TD. Dental management of the medically compromised patient. In: McDonald RE, Hurt WC, Gilmore HW, Middleton RA, eds. Current Therapy in Dentistry, vol. 7. St. Louis: The CV Mosby Company; 1980:3–7.

7. Dissertations and thesis: Teerakapong A. Langerhans Cells in human periodontally healthy and diseased gingiva. (Thesis). Houston, TX: University of Texas; 1987.92 p.

Other published material:

8. Newspaper article: Shaffer RA.Advances in chemistry are starting to unlock mysteries of the brain. The Washington Post 1989 Ang 7; Sect.A:2 (col. 5).

References – electronic quotations:

9. Online journals without volume and page information. Berlin JA , Antman EM. Advantages and limitations of metaanalytic regressions of clinical trials data. Online J Curr Clin Trials (serial online). June 4; doc 134. Accessed July 20, 2000.

10. Online journals with volume and page information. Fowler EB, Breault LG. Ridge augmentation with a folded acellular dermal matrix allograft: A case Report. J Contemp Dent Pract (serial online). 2001;2(3):31–40. Available from: Procter&Gamble Company, Cincinnat, OH. Accessed December 15, 2001.

11. World Wide Web.Centers for Disease Control and Prevention. Preventing emerging infectious diseases: Addressing the problem of antimicrobial resistance. Available at: http://www.cdc.gov/ncidod/emergplan/antiresist/. Accessed November 5, 2001.

UNITS OF MEASUREMENTS

All measurements should be reported in terms of the International System of Units (SI)

ABBREVIATIONS AND SYMBOLS

Avoid abbreviations in the text but whenever possible use standard abbreviations. However, if nonstandard abbreviations are used, the full term of which and abbreviation stands for should precede its first use in text. Names of symptoms, signs and diseases, as well as anatomic and histologic characteristics cannot be abbreviated.

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The corresponding authors of all types of articles except letters, news and book reviews will receive 1 offprint free of charge.

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Footnotes should be used only to identify author affiliation; to explain symbols in tables and illustrations. Use the following symbols: #,†,*,#,$ etc.

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