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Indeksi oralnog zdravlja i hipomineralizacija kutnjaka i sjekutića kod bosanske djece u dobi od 12 godina

Oral Health Indices and Molar Incisor Hypomineralization in 12 Year Old Bosnians

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Sažetak

Svrha je rada predstaviti prevalenciju zubnog karijesa, parodontnih stanja i razvojnih defekata u caklini te HKS kod djece iz Bosne i Hercegovine u dobi od 12 godina. **Materijal i metode:** U osam kantona Federacije Bosne i Hercegovine (FBH) te u Republici Srpskoj (RS) tijekom godine 2008. bila je provedena anketa. Konačan je uzorak sadržavao 560 dvanaestogodišnjaka. Parametri korišteni kako bi se izmjerio status oralnog zdravlja bili su indeksi: DMFT i SiC, te onaj razvojnih defekata u caklini (RDC). Procjenjene su također potrebe liječenja te zatečena hipomineralizacija kutnjaka i sjekutića (HKS). Jedna stomatološka ekipa klinički je obradila sve ispitanike u skladu s metologijom i kriterijima SZO-a, što znači običnim stomatološkim zrcalom i standardnom parodontnom sondom CPITN pod prirodnim svjetlom. **Rezultati:** prosječna vrijednost indeksa DMFT kod dvanaestogodišnjaka iznosila je 4,16 ± 2,92. U prosjeku je 91 posto ispitane djece u dobi od 12 godina imalo karijes. Indeks SiC iznosio je 7,41 ± 3,31. Među ispitanom djecom barem je 5,7 posto imalo najmanje jedan zub s fisurnim pečatnim ispunom. Zdravi je parodont imalo 43 posto dvanaestogodišnje djece. Prevalencija razvojnih defekata u caklini među dvanaestogodišnjom djecom iz Bosne i Hercegovine iznosila je 32,80 posto, a HKS-a 12,3 posto. Prosječan broj zuba zahvaćenih HKS-om bio je 5,59. **Zaključak:** ne zadovoljava status oralnoga zdravlja u Bosni i Hercegovini, nakon analize vrijednosti indeksa DMFT te stanje parodonta kod djece u dobi od 12 godina. Potrebna je prevencija na razini javnog zdravstva, a i promicanje oralnoga zdravlja.

Uvod

Dosad nisu bili dostupni valjani i točni podaci o oralnom zdravlju dvanaestogodišnjaka u Bosni i Hercegovini, kao standardiziranoj skupini za praćenje oralnoga zdravlja prema prijedlozima Svjetske zdravstvene organizacije (SZO-a). No, ipak neka ranija istraživanja u određenim dijelovima zemlje dala su neke podatke o zubnom karijesu među dvanaestogodišnjacima. Prosječni DMFT (Decayed,

Introduction

Accurate data about oral health of Bosnia and Herzegovina's twelve-year-olds, as standardized monitoring group for oral health monitoring, suggested by World Health Organization (WHO), has so far been unavailable. Earlier research conducted only in parts of the country provided some information on prevalence of dental caries among 12-year-olds. The mean DMFT (Decayed, Missing, Filled

Missing, Filled Teeth – kariozni, odsutni, ispunjeni zubi) u skupini dvanaestogodišnjaka promatranih 1997. iznosio je 6,2, što je gotovo isto kao i vrijednosti za godinu 1986. u doba SFRJ, kada je taj indeks iznosio 6,3 (1,2). Podaci o ostalim parametrima oralnoga zdravlja potrebnih za analizu, kao što su stanje parodonta, caklinski razvojni defekti (RDC) i potrebe liječenja, nisu dostupni ni za Bosnu i Hercegovinu, ni za većinu drugih zemalja u regiji.

U zdravstvenom sustavu bosanskohercegovačke Federacije trenutačno je naglasak na kurativnom pristupu, a ne na preventivnim mjerama, te je očit manjak sustavne prevencije bolesti u javnom zdravstvu, a nedostaje i promidžba oralnoga zdravlja. Sustavni podaci samo su nužna pomoć u postupku preustroja oralne zdravstvene skrbi na razini zemlje zbog rata i budućih gospodarskih promjena. Osnovni podaci o indeksima oralnog zdravlja za mladu populaciju potrebni su radi provedbe osnova za dentalno zdravstveno zakonodavstvo u Federaciji Bosne i Hercegovine.

Svrha je ovog ispitivanja procijeniti status oralnoga zdravlja nakon analize vrijednosti DMFT-a, stanja parodonta, razvojnih defekata u caklini (RDC) i procjena o potrebi liječenja dvanaestogodišnje bosanske djece u skladu s metodologijom SZO-a.

Ispitanici i postupci

Područje ispitivanja

Bosna i Hercegovina (BiH) sastavljena je od dvaju entiteta (FBH i RS) te administrativne jedinice (Brčko). Federacija (FBH) podijeljena je na 10 kantona, a prostire se na području od 51.128 četvornih kilometara i ima 3,717.130 stanovnika. Godine 2000. zemlja je imala 787 djelatnih stomatologa.

Bosna i Hercegovina je područje s niskim prirodnim udjelom fluora u pitkoj vodi (manje od 0,1 ppm). Zubne paste s fluoridima mogu se kupiti.

Promatrana populacija i postupak uzorkovanja

Stratifikacija uzorka provodi se prema veličini zajednica i administrativnim upravnim područjima (regijama) u skladu s preporukama SZO-a (3). Osam odabranih kantona iz FBH-a, te iz Banjaluke u RS-u, predstavljeni su svaki s uzorkom ispitanika s jedne lokacije (Tablica 1.). Ministarstva prosvjete dala su nam popise svih javnih osnovnih škola - 386 u FBH-u, 170 u RS-u i 12 u adminstrativnom području Brčko. Anketa je obavljena u školama s pravom pristupa javnosti, budući da je broj privatnih škola bio toliko mali da statistički nije bio važan. Izabrano je bilo

Teeth) in the group of 12-year-olds examined in 1997 was 6.2 which is almost identical to the 1986 value for former Yugoslavia when DMFT index was 6.3 (1,2). Data about other oral health parameters, necessary for monitoring the oral health, such as periodontal condition, developmental defects of enamel (DDE) and treatment needs are unavailable for Bosnia and Herzegovina and most of the countries in the region.

At the moment, the emphasis of Bosnia and Herzegovina's oral health-care system is on curative rather then preventive approach, with an obvious lack of community-based disease prevention and oral health promotion. Systematic data is needed to assist the process of reorganization of the country's oral health-care necessitated by the war and subsequent economic changes. Basic data of oral health indices for young population are necessary for establishing solid basis of dental health care policy in the country.

The aim of this study was to assess oral health status through DMFT values, periodontal conditions, developmental defects of enamel, MIH and treatments needs in 12-year-old children in Bosnia and Herzegovina (BH) in accordance to WHO methodology.

Subjects and Methods

Study area

Bosnia and Herzegovina (BH) is made up of two entities (Federation of Bosnia and Herzegovina and Republic Srpska) and one district (Brčko). Federation of Bosnia and Herzegovina (FBH) is further divided into 10 cantons. It covers an area of some 51,128 km^2, and has population of 3,717,130 million people. In the year 2000, the country had 787 active dentists.

Bosnia and Herzegovina is an area with low natural fluoride content in the drinking water (less than 0.1 ppm). Fluoride-toothpastes are available in BH.

Study population and sampling procedure

Sample stratification is done by size of community and by administrative areas (regions) according to relevant WHO recommendations (3). Eight studied cantons from FBH and Banja Luka from RS were represented by a sample of examinees from one location (Table 1). Education ministries provided us with the lists of all public primary schools (386 in FBH, 170 in RS and in Brčko District 12). Survey was conducted in public schools since the number of private schools was as low as to be insignificant. 14 schools were se-

Tablica 1. Nacrt uzorka ankete prema lokaciji, mjestima i urbanoom/ruralnom statusu
Table 1   Sample design of survey by location, sites and urban/rural status

Lokacija • Location	FBH(kantoni)/RS • FBH(cantons)/RS	Br.mjesta/škole • No. sites/schools	Br. ispitanika • No. examinees	Urbano/ruralno* • Urban/rural*
Sarajevo	Sarajevo	4	160	Urbano • Urban
Banja Luka	RS	2	80	Urbano • Urban
Tuzla	Tuzla	2	80	Urbano • Urban
Mostar	Hercegovačko-neretvanski	1	40	Ruralno • Rural
Široki Brijeg	Zapadno-hercegovački	1	40	Ruralno • Rural
Visoko	Zeničko-dobojski	1	40	Ruralno • Rural
Goražde	Bosansko-podrinjski	1	40	Ruralno • Rural
Sanski Most	Unsko-sanski	1	40	Ruralno • Rural
Vitez	Srednjo-bosanski	1	40	Ruralno • Rural
Total	Bosna i Hercegovina	14	560	

* Ruralno područje (≤100 000 stanovnika), urbano područje (≥ 100 000 stanovnika) • Rural area (≤100 000 citizens), urban area (≥ 100 000 citizens)
FBH - Federacija Bosna i Hercegovina • Federation of Bosnia and Herzegovina
RS - Republika Srpska • Republic Srpska

14 škola i to slučajnim odabirom uzorka. Nakon toga pribavljena su odobrenja za istraživanja od svih ministarstava i drugih mjerodavnih tijela, te smo stupili u izravnu vezu sa svih 14 škola kako bismo se dogovorili o točnim datumima naših posjeta i o drugim organizacijskim te administrativnim elementima istraživanja. U svakoj je školi odabrana prva učionica (imenovana A ili 1) te su prema potrebi bila uključena i djeca iz susjednoga razreda (imenovana B ili 2). U istraživanje su bila uključena samo djeca rođena godine 1992. U svakoj odabranoj školi pregledano je 40 ispitanika, budući da je 1997. postatak dvanaestogodišnjaka bez karioznih zuba iznosio 6 posto (1). Konačan je uzorak bio reprezentativan za Bosnu i Hercegovinu i uključivao je 560 dvanaestogodišnjaka.

Pocjena oralnoga zdravlja

Jedna je stomatološka ekipa posjetila osnovne škole te klinički pregledala sve ispitanike prema metologiji i kriterijima SZO-a, služeći se stomatološkim zrcalima, standardnim parodontnim sondama CPITN, te prirodnim svjetlom (3). Parametri korišteni za procjenu statusa oralnog zdravlja bili su indeksi: DMFT i SiC, ima li pečatnih materijala, mjesni parodontni indeks i indeks razvojnih defekata u caklini (RDC). Isto tako su procijenjene i potrebe liječenja te hipomineralizacija kutnjaka i sjekutića (HKS).

Kliničke preglede zubnog karijesa u školama je obavljao jedan stomatolog educiran za to da se služi indeksom DMFT, a pregledao je 25 djece u dobi od 12 godina, no ona nisu bila uključena u konačan uzorak. U testiranju liječnikove pouzdanosti koristila se kappa-statistika. Kappa-vrijednosti procijenjene su nakon ponovljenog pregleda za intrakonzistenciju terenskog istražitelja na iznos od kappa=0,91.

lected from the lists by simple random sample selection. Granted permissions for the research by all respective ministries and other relevant authorities was obtained, and we directly contacted all 14 schools to set up the precise dates of visits and other organizational and administrative elements of the research. In each school the first classroom was chosen (designated A or 1), and children from the next class (designated B or 2) were included if necessary. Only children born in 1992 were included in the study. In each primary school 40 subjects were examined since the 1997 percentage of 12-year-olds without decayed teeth was 6% (1). The final sample was representative for BH and included 560 12-year-olds.

Assessment of oral health

One dental team visited primary schools and clinically examined all subjects in line with WHO methodology and criteria, using dental mirrors and standard CPITN periodontal probe, under natural light (3). The parameters used to measure oral health status were: DMFT index, SiC index, presence of sealants, community periodontal index and developmental defects of enamel index (DDE). Treatment needs and molar incisor hypomineralizations (MIH) were assessed as well.

Clinical examination for recording dental caries was carried out in schools by one investigator, previously trained in using the DMFT index on twenty-five 12-year-old subjects not included in the final sample. Kappa statistics was used to test the intra-investigator reliability. The kappa values estimated from repeat examination for the intra-consistency of the fieldwork investigator was kappa = 0.91.

Parodontni je status zabilježen CPI indeksom, prema preporukama SZO-a za ispitanike mlađe od 15 godina (3).

Obavljen je klinički pregled s modificiranim indeksom i preporučenim kriterijima za HKS (4,5). Intraistraživateljska pouzdanost testirana je na 25 ispitanika različite dobi s različitom kliničkom slikom caklinskih potamnjenja/hipoplazije. Kappa-vrijednosti iznosile su 0,84. Bodovanje razvojnih defekata cakline i HKS-a obavljeno je u vlažnim uvjetima. Prije pregleda svima su bile rolicama staničevine uklonjene veće nakupine plaka i ostaci hrane ako ih je bilo.

Statistička analiza

Koristio se statistički programski paket, verzija 12,0 (SPSS Inc., Chicago, IL, SAD). Rezultati istraživanja analizirani su prema sljedećim statističkim metodama: postocima, aritmetičkim srednjim vrijednostima, standardnoj devijaciji i nesparenim t-testom. P-vrijednosti manje od 0,05 smatrale su se znatnima.

Rezultati

Srednja vrijednost indeksa DMFT-a na razini cijelog uzroka iznosila je 4,16 ± 2,92, a rezultati ispitanika obaju spolova kombinirani su zbog toga što nije ustanovljena nikakva razlika u pojavi karijesa među spolovima u toj dobi (t test 0,7 < P {|t|>0,293} < 0,8). Zapažene su demografske razlike (Slika1.) D-komponenta činila je glavni dio indeksa (45,4%), zatim slijede zubi s ispunima (42,0%) i manji postotak ekstrahiranih zuba (12,5%). U prosjeku 91 posto pregledanih dvanaestogodišnjaka ima karijes.

Periodontal status was recorded by using CPI index according to WHO recommendations for subjects under 15 years of age (3).

Clinical examination with modified DDE index and recommended criteria for MIH was carried out (4, 5). Intra-investigator reliability was tested on twenty-five subjects of different age with a variety of enamel opacities/hypoplasia. Kappa values were kappa = 0.84. Scoring of developmental defects of enamel and MIH was done under wet conditions. Gross plaque or food debris was removed, if necessary, with cotton-rolls prior to examination.

Statistical analysis

The Statistical Package for Social Science, version 12.0 (SPSS Inc., Chicago, IL, SAD) was used. Research results were analysed using following statistical methods: percentages, arithmetic mean value, standard deviation and unpaired t-test. P-values less than 0.05 were considered significant.

Results

Mean DMFT at the level of the entire sample was 4.16 ± 2.92; results for respondents of both genders were combined as no gender-based differences in caries experiences were found (T test 0.7 < P {|t|>0.293} < 0.8). Demographic differences were noticed (Fig.1). The D-component constituted the major part of the index (45.4%), followed by filled teeth (42.0%) and a smaller percentage or 12.5% of extracted teeth. On the average, 91% of the 12-year olds were affected with dental caries.
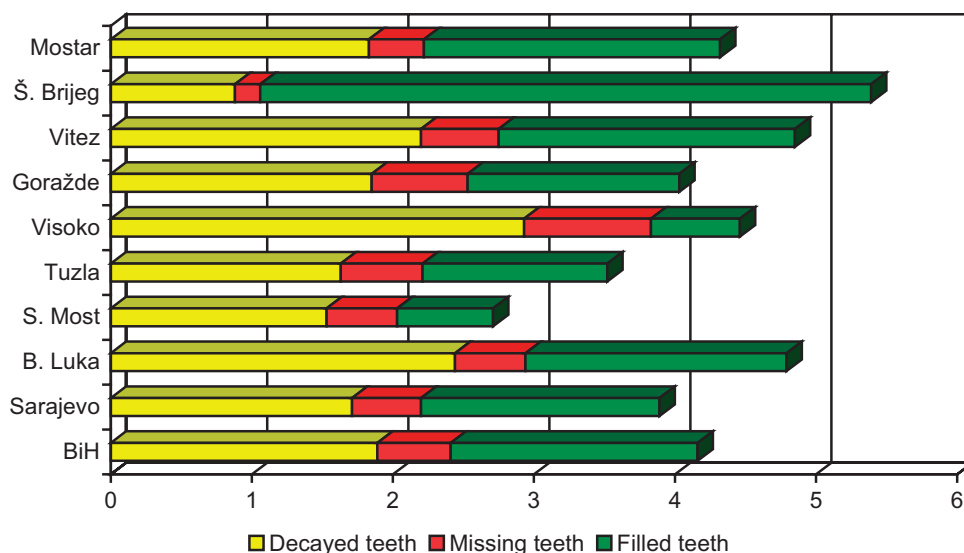
Slika 1. Demografske razlike u indeksu DMFT-a kod dvanaestogodišnjaka u BiH
Figure 1 Demographic differences in DMFT index of twelve-year-olds in BH

SiC podskupinu činilo je 187 djece. Indeks SiC-a (gornja trećina frekvencijske raspodjele DMFT-a) za dvanaestogodišnjake u Bosni i Hercegovini izračunana je na iznos od 7,41 ± 3,31.

Kod 5,7 posto djece pronađen je barem jedan zub s fisurnim pečatnim materijalom.

Indeks T-potrebe varirao je od 0,18 (Tn-uključenost pulpe) do 1,73 (Tn-fisurni pečatni materijal), a kod 70 posto djece bio je nužan fisurni pečatni ispun (Tablica 2.).

Kad je riječ o parodontnom statusu cijelog uzorka, 43 posto dvanaestogodišnjaka imalo je zdrava parodontna tkiva (Slika 2.).

The SiC subgroup consisted of 187 children. The SiC Index (the top one third of the DMFT frequency distribution) for 12-year-olds in BH was calculated to be 7.41 ± 3.31.

Among examined children, 5.7% had at least one tooth with a fissure sealant.

The T-need index varied from 0,18 (Tn-pulpal involvement) to 1,73 (Tn-fissure sealant), while 70% of sample showed need for fissure sealants (Table 2)

As for the periodontal status of the total sample, 43% of 12-year-olds had healthy periodontal tissues (Figure 2).

Tablica 2. Srednje vrijednosti standardne devijacije t-testa i postotak dvanaestogodišnjaka prema potrebama liječenja
Table 2 Mean values and standard deviation for T-need and percentage of 12-year-olds by treatment need

	POTREBE LIJEČENJA • TREATMENT NEEDS					
	Preventivno • preventive	fisurni pečat • fissure sealant	Ispun na jednoj plohi • one surface filling	Ispun na više ploha • multi surface filling	Uključenost pulpe • pulpal involvement	ekstrakcija • extraction
Srednja vrijednost± SD • Mean value ± SD	0,96 ± 1,21	1,73 ± 1,73	0,96 ± 1,38	0,43 ± 0,86	0,18 ± 0,50	0,29 ± 0,70
% ispitanika • % of subjects	50,80	70,77	48,48	27,27	13,90	18,72
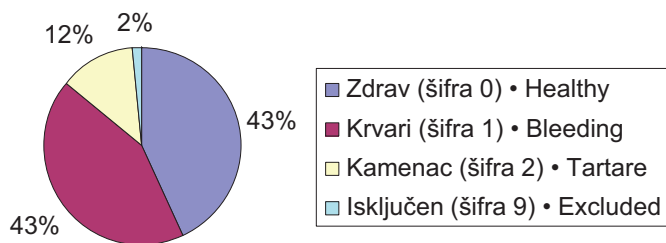
Slika 2. Parodontna stanja kod dvanaestogodišnjaka iz BiH prema najvišim CPI bodovima po osobi
Figure 2 Periodontal conditions in BH 12-year–olds according to the highest CPI score per person

Legenda:
- Zdrav (šifra 0) • Healthy
- Krvari (šifra 1) • Bleeding
- Kamenac (šifra 2) • Tartare
- Isključen (šifra 9) • Excluded

Razvojni defekti u caklini među dvanaestogodišnjom djecom iz Bosne i Hercegovine iznosila je 32,8 posto. Gotovo je 7 posto (n=390) pregledanih zuba imalo znakove razvojnih defekata cakline, uglavnom s jasno ograničenim zatamnjenjima. Ograničena zatamnjenja dijagnosticirana su kod 6,4 posto (n =361) pregledane djece ili 92,6 posto zahvaćenih zuba (Tablica 3.).

HKS među bosanskom djecom u dobi od 12 godina iznosio je 12,3 posto. Prosječan broj zahvaćenih zuba među djecom s HKS-om bila je 5,59 ± 2 - od toga je 3,16 ± 1 bilo prvih trajnih kutnjaka (PTK). Polovica ispitanika s HKS-om imala je zahvaćena sva četiri PTK-a. Promijenjeni PTK imalo je 17,58 posto djece, a ostala su imala udruženu hipomineralizaciju sjekutića.

The prevalence of developmental defects of enamel among BH twelve-year-olds was 32.8%. Nearly seven percent (n=390) of examined index teeth had developmental defects of enamel with the highest frequency of demarcated opacities. Demarcated opacities was diagnosed in 6.4% (n=361) of examined or 92.6% of affected teeth (Table 3).

The prevalence of MIH among BH 12-year olds was 12.3%. The average number of affected teeth among children with MIH was 5.59 ±, 2 of which 3.16 ± 1 were first permanent molars (FPM). Half of the examinees diagnosed with MIH had all four FPM affected. 17.58% had changes only in FPM, while the rest of the affected children had concomitant hipomineralization of the incisors.

Tablica 3. Raspodjela razvojnih defekata u caklini kod djece u BiH u dobi od 12 g. prema tipu
Table 3 Distribution of developmental defects of enamel in BH 12-year olds by type

RAZVOJNI DEFEKTI CAKLINE • DEVELOPMENTAL DEFECTS OF ENAMEL	Broj zuba • N of teeth	% zahvaćenih zuba • % of teeth affected
Ogračena zatamnjenja • Demarkated opacities	361	92,56
Difuzna zatamnjenja • Diffuse opacities	12	3,08
Hipoplastični defekti • Hypoplastic defects	7	1,79
Drugi defekti • Other defects	4	1,03
Ograničena / Difuzna zatamnjenja • Demarkated / Diffuse opacities	3	0,77
Ograničena zatamnjenja / Hipoplastični defekti • Demarkated opacities/Hypoplastic defects	3	0,77
Difuzna zatamnjenja / Hipoplastični defekti • Diffuse opacities/Hypoplastic defects	0	0,00
UKUPNO • TOTAL	390	100,00

Rasprava

Godine 2004. vrijednost indeksa DMFT za dvanaestogodišnjake u Bosni i Hercegovini iznosila je 4,16. Ako se te vrijednosti usporede s iznosom od 6,3 (2) dobivenim u Vrbičkoj studiji iz godine 1985. u doba bivše SFRJ , i s iznosom od 6,2 (1) iz Ivankovićeve studije iz 2003., jasno je da se oralno zdravlje poboljšalo. Teško je objasniti razloge za to, budući da su sve poduzete mjere bile ograničene na lokalnu razinu (na primjer školski programi, kantonalni edukativni projekti, itd.). Ipak, jedno od mogućih objašnjenja jest naše korištenje metologije SZO-a u dijagnozi karijesa, prema kojoj su isključeni zubi zahvaćeni promjenama koje se javljaju prije klinički prepoznatljivih caklinskih lezija ili promjena sličnih karijesu. Uporaba parodontne sonde CPI također može smanjiti broj dijagnosticiranih karijesnih lezija. Na osnovi dobivenih vrijednosti DMFT-a, mogli bismo zaključiti da Bosna i Hercegovina pripada istočnoeuropskoj regiji, tj. skupini visokorizičnih zemalja (6). Usporedbe vrijednosti DMFT-a kod dvanaestogodišnjih stanovnika Bosne i Hercegovine i one ustanovljene za istu populacijsku skupinu u rasponu od 3,24 u Meksiku; 2,4 na Filipinima; 1,07 u Španjolskoj; 1,66 u Izraelu do najniže vrijednosti od 0,65 i 0,5 iz Nikaragve i Indije, upućuju na to da su naši dvanaestogodišnjaci u vrlo velikoj opasnosti. (7-12). Posljednjih je godina visokorizičnim pojedincima posvećena posebna pozornost jer je analiziran prosječni indeks DMFT-a trećine najviše pogođenih ispitanika (13). Tijekom 2001. iznos indeksa DMFT-a za jedanaestogodišnjake u Grčkoj bio 1,8, a indeks SiC-a iznosio je 4,2 (14). Iste je godine u Velikoj Britaniji bila zabilježena vrijednost indeksa SiC-a od 3,2. Vrijednost toga indeksa za djecu iz Bosne i Hercegovine iznosila je 7,4, što je znatno više od navedenih vrijednosti te se

Discussion

In 2004, the value of DMFT index for twelve-year-olds in Bosnia and Herzegovina was 4.16. When the above values were compared with values of Vrbic 1985 study in the former Yugoslavia, which was 6.3 (2) and the results of Ivankovic 2003 study 6.2 (1), it becomes obvious that the oral health has improved. It is difficult to explain the reasons for this improvement because all measures taken were limited to local level (e.g. school programs, cantonal educational projects and so on). However, one of the possible explanations might be that this study used WHO methodology for caries diagnosis, under which teeth affected by changes preceding clinically detectable enamel lesions or changes similar to caries were excluded. The use of CPI periodontal probe could also lower the number of diagnosed caries lesions. Based on the obtained DMFT values, we can conclude that BH belongs to the East European region, that is to the group of high-risk countries (6). Comparisons of DMFT values in BH twelve-year olds and those established for the same population group ranging from 3.24 in Mexico, 2.4 in Philippines, 1.07 in Spain, 1.66 in Israel to the lowest values of 0.65 and 0.5 registered in Nicaragua and India respectively lead to conclusion that our twelve-year-olds are at greatest risk. (7-12). Recently, individuals at highest risk are being given special attention by analyzing average DMFT index values for a third of the most affected examinees (13). In the 2001. DMFT index value for Greek eleven-year-olds was 1.8, while SiC index was 4.2 (14). The same year in Great Britain value of SiC index 3.2 was registered. (15). The value of SiC index of BH twelve-year-olds was 7.4 which was significantly over the above given values and has to be reduced to under 3 by the year 2015 to achieve the

mora reducirati na manje od tri do godine 2015., kako bi se postiglo poboljšanje oralnoga zdravlja prema zahtjevima koje je postavio Bratthall (13).

Postotak ispitanika u Bosni i Hercegovini s barem jednim fisurnim pečatnim ispunom, bio je vrlo nizak (5,7%), posebice u usporedbi s dvotrećinskim iznosom zabilježenim kod petnaestogodišnjaka iz Danske. To upućuje na vrlo rijetku uporabu te učinkovite preventivne mjere kod stomatologa u Bosni i Hercegovini (16). Fisurni pečatni ispuni dokazana su djelotvorna mjera u kontroli karijesa te bi se zbog toga trebala i promicati.

Djelomični zapisi indeksa CPITN-a bili su u skladu sa smjernicama SZO-a za tu populacijsku skupinu (3). Gingivno krvarenje (bod 1), kao često stanje kod djece i adolescenata, bilo je u skladu s drugim istaživanjima (17). Mnoga stanja koja je potrebno liječiti (krvarenje – 43%, kamenac – 12%) prisiljavaju nas na što raniju prevenciju i dijagnoze parodontnih bolesti kako bi to postalo važan dio strategije za što brže poboljšanje oralnoga zdravlja. Rana dijagnoza u djetinjstvu te eliminacija mogućih rizičnih čimbenika, može kod odraslih preduhitriti razvoj destruktivne parodontne bolesti.

Trećina ispitanika (32,8%) imala je barem jedan indeksni zub s nekim od razvojnih defekata u caklini. Difuznih zatamnjenja u našem uzorku bilo je vrlo malo, što pokazuje malu izloženost fluoridima. Potvrđene su teze koje podupiru neki autori o ograničenim zatamnjenjima kao dominantnom tipu RDC-a u područjima s izrazito niskim razinama fluora u pitkoj vodi (18, 19).

HKS ustanovljen među bosanskohercegovačkom djecom u dobi od 12 godina bio je najsličniji onome iz danske studije (9,7%) za populaciju djece u dobi od 11 godina (20). Manji HKS ustanovljen je u Njemačkoj (5,6%) i 2,9% na uzorku iz Libije (21, 22), dok je HKS bio manje čest u Bosni i Hercegovini nego kod osmogodišnjaka iz Švedske (18,4%)i kod trinaestogodišnjaka iz Finske (19,3%) (23,24). Iako se čini da je HKS manje čest u Bosni i Hercegovini, ipak treba osigurati izobrazbu stomatološkog osoblja za ranu dijagnostiku i mogućnosti liječenja toga stanja.

Glavni razlozi za trenutačno oralno zdravlje kod bosanske djece jesu nedostatak bilo kakvih populacijskih preventivnih programa i uglavnom kurativno usmjerene stomatološke politike, siromaštvo stanovništva te promjene u uvjetima stanovanja tijekom rata i u poslijeratnom razdoblju (25).

Zaključak

Budući da se oralno zdravlje u Bosni i Hercegovini, promatrano nakon analize iznosa indeksa DM-

set goal of global oral health improvement proposed by Bratthall (13).

The percentage of examinees in BH with at least one fissure sealant was extremely low (5.7%) especially when compared with two thirds of 15-year-olds in Denmark, and it indicates that BH dentists rarely use this effective preventive measure (16). Information that only 5.7% of examinees have at least one fissure sealant indicates that BH dentists rarely use this preventive measure. Since fissure sealants are proven to be an efficient measure for caries control, their use should be promoted.

Partial recordings of CPITN index was in accordance with WHO guidelines for this population group (3). Gingival bleeding (score 1) as predominant condition in children and adolescents was in accordance with other investigations (17). High values of treatment needs conditions (bleeding - 43%, calculus - 12%) urge to include prevention and early diagnosis of periodontal diseases as significant part of strategy for better oral health improvement. Early diagnosis in childhood with elimination of potential risk factors would prevent development of destructive periodontal disease in adults.

One third of examinees (32.8%) had at least one index teeth with some developmental defect of enamel. The presence of diffuse opacities in our sample was insignificant and indicates a low exposure to fluorides. Theses supported by some authors that demarcated opacities were the dominant type of DDE in areas with extremely low levels of fluor in water were confirmed (18, 19).

Established MIH prevalence among 12-year-olds in Bosnia and Herzegovina was the most similar to that from the Danish study (9.7%) of 11-year-olds (20). A lower prevalence was established in German (5.6%) and 2.9% in Libyan sample (21, 22), while MIH was less common in BH than among Swedish 8-year-old (18.4%) and Finish 13-year-old (19.3%) examinees (23,24). Since MIH seems to be common in BH, education of dental personal for early diagnosis and treatment options for this condition should be provided.

The main reasons for the present oral health situation of Bosnian children are the lack of any population preventive programs, predominantly curative-orientated dental policy, poor socio-economic status of population, and a change in living conditions during and after the war time (25).

Conclusions

Since oral health status in BH observed through DMTF index values and condition of periodonti-

FT-a i stanja parodonta kod dvanaestogodišnjaka, pokazalo kao nezadovoljavajuće, potrebno je početi s prevencijom i promidžbom oralnoga zdravlja na mjesnoj razini. Čini se da je hipomineralizacija kutnjaka i sjekutića sve češća u Bosni i Hercegovini, i zato treba za stomatološko osoblje organizirati izobrazbu o ranoj dijagnostici i načinima liječenja tih stanja.

um of 12-year-olds is unsatisfactory, introduction of community-based prevention and oral health promotion is necessary. Molar incisor hypomineralizations seems to be common in BH, education of dental personnel for early diagnosis and treatment options for this condition should be provided.

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Acknowledgments

Abstract

Objectives: To present the prevalence of dental caries, periodontal conditions, developmental defects of enamel and MIH in 12-year-olds in Bosnia and Herzegovina (BH). **Methods:** A survey was carried out in 8 cantons of the Federation of BH (FBH) and in Republic Srpska (RS) in 2004. The final sample included 560 twelve year-olds. The parameters used to measure oral health status were: DMFT index, SiC index, presence of sealants, community periodontal index and developmental defects of enamel index (DDE). Treatment needs were assessed as well as molar incisor hypomineralizations (MIH). One dental team clinically examined all subjects in line with WHO methodology and criteria, using plane dental mirror, standard CPITN periodontal probe under natural light. **Results:** The average DMFT of 12-year-olds was 4.16 ± 2.92. On the average, 91% of the 12-year-olds was affected with dental caries. The SiC Index was 7.41 ± 3.31. Among examined children, 5.7% had at least one tooth with a fissure sealant. 43% of 12-year-olds had healthy periodontium. The prevalence of developmental defects of enamel among BH twelve-year-olds was 32.80%. The MIH prevalence was 12.3%. The average number of affected teeth with MIH was 5.59. *Conclusions:* Oral health status in BH observed through DMTF index values and condition of periodontium of 12-year-olds is unsatisfactory. Community-based prevention and oral health promotion are necessary.

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