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Stanje parodonta i gubitak zuba kod pacijenata s reumatoidnim artritisom

Periodontal Condition and Tooth Loss in Rheumatoid Arthritis Patients

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Sažetak

Svrha rada: Parodontopatije i reumatoidni artritis (RA) slični su u osnovnim patološkim procesima. Kronična upala i disfunkcija sustava imunosti glavna su obilježja obiju bolesti koje potiču citokini kao medijatori upale. U ovoj studiji procijenjeno je stanje parodonta i gubitak zuba kod oboljelih od reumatoidnog artritisa te je njihovo stanje uspoređeno sa zdravim sudionicima u istraživanju. **Materijali i metode:** U istraživanju je sudjelovalo 106 pacijenata – 53 s dijagnosticiranim RA-om i 53 zdravih u kontrolnoj skupini. Svi su bili razvrstani prema spolu i dobi. Zabilježeni su i podaci o socijalno-ekonomskom statusu te o oralnom i sistemskom zdravlju. Klinički stomatološki pregled sastojao se od šest mjerenja svakog zuba. Vrijednosti dobivene za krvarenje pri sondiranju (BOP), dubina sondiranja (PD), razina kliničkog pričvrstka (CAL) i broj zuba zabilježeni su za svakog pacijenta. Dijagnoze parodontitisa postavljene su na temelju kriterija Američke akademije za parodontologiju (American Academy of Periodontology), a RA je dijagnosticiran prema mjerilima Američkoga studija reumatologije (American College of Rheumatology). **Rezultati:** Pacijenti s RA-om imali su mnogo viši postotak BOP-a te znatno veći CAL u usporedbi s kontrolnom skupinom ($p < 0,001$ za svaki indeks). U skupinama nije bilo razlike u gubitku zuba. **Zaključak:** Pacijenti s dijagnozom RA imali su lošije stanje parodonta nego sistemski zdravi.

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Ključne riječi
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Uvod

Parodontološke bolesti imaju složeno podrijetlo. Na početku bakterije izazivaju upalu, a za napredovanje bolesti odgovorna je imunost domaćina. Zato se može reći da je imunosni odgovor važan u razvoju parodontopatija te da na bolest utječu biološki čimbenici i ponašanje pacijenta. U razvijenim zemljama težak oblik parodontitisa ima samo 10 do 15 posto populacije od 20 do 40 godina (1), no rasprostranjenost je nešto češća kod pacijenata u dobi od 50 do 60 godina (2). Na to utječe mnogo toga, primjerice vrsta infekcije, dob, sistemsko zdravlje te ostali rizični čimbenici (1,2). Učestalost parodontopatija gotovo je jednaka i u razvijenim zemljama i u onima u razvoju (3).

Humoralni, primarni imunosni odgovor, ponajprije imunoglobulina G i A (IgG-a i IgA), osigurava zaštitu od patogeneze parodontološke bolesti (4). Upalni citokin, interleukin 1 i čimbenik tumorske nekroze te prostaglandini pojačavaju upalni odgovor i potiču proizvodnju metaloproteinaza, pa se

Introduction

Periodontal disease has a multi-factorial origin. It is first induced by bacteria, but its progress is influenced by the mechanisms of host defense against the bacteria. Thus, the immune response is important in the development and progression of periodontal disease, and biological and behavioral factors can influence the disease. In developed countries, severe periodontal disease is present in only 10-15% of the population between the ages of 20 and 40 years (1), whereas the prevalence is higher among those between 50 and 60 years of age (2). The prevalence is affected by many factors such as type of infection, age, systemic condition, and other risk factors (1, 2). The severity of periodontal disease seems to differ little between developed and developing countries (3).

A humoral immune response, primarily immunoglobulin G and A (IgG and IgA), has a protective effect against the pathogenesis of periodontal disease (4). The inflammatory

zbog toga raspada vezivno tkivo i u slučaju parodontitisa i reumatoidnog artritisa (RA) (5-7).

RA je kronična autoimuna bolest s upalom zglobova uz proliferaciju sinovijalnih stanica te progresivnu eroziju hrskavice i kostiju. Abnormalnosti se pojavljuju i izvan zglobova te zahvaćaju i ostale organe (8,9). Od reumatoidnog artritisa obolijeva 0,5 do 1 posto populacije (10) i to uglavnom u dobi od 30 do 50 godina, češće žene negoli muškarci (omjer 3:1) (11).

Parodontitis i RA kronične su autoimune bolesti sa sličnim patološkim procesima. U oba slučaja kronična upalna reakcija nastaje u graničnom području sastavljenom od vezivnoga tkiva i kostiju (12). Sve je više dokaza da su oba stanja rezultat nerazmjera između upalnih i protuupalnih citokina (13). Navedene sličnosti potaknule su mnoga istraživanja kako bi se pronašla povezanost RA i parodontitisa, iako su neki rezultati dvojbeni (14, 16).

Jasno je da pojedinci s uznapredovalim RA-om imaju velike parodontološke probleme u usporedbi s onima kojima nije dijagnosticiran (13). U nekoliko studija istraživao se oralni status, posebice parodontološki, pojedinaca s RA-om (12, 16 –23). Unatoč nedosljednim rezultatima (14, 21, 22) upozoreno je na veću rasprostranjenost parodontopatija kod pojedinaca s RA-om – relativni rizik iznosi 4,7 (12, 15 –19, 24).

Ovo istraživanje bavilo se stanjem parodonta i gubitkom zuba kod pacijenata s RA-om te usporedbom sa zdravim sudionicima u kontrolnoj skupini.

Ispitanici i postupci

U istraživanju je sudjelovalo 106 pacijenata (53 s dijagnozom RA i 53 zdrava sudionika). Pacijenti s dijagnozom RA bili su iz zdravstvenog doma u Caruaru, u državi Pernambucu u Brazilu. RA je dijagnosticiran prema smjernicama Američkoga studija za reumatologiju (American College Rheumatology) (25, 26). Stanje parodonta definirano je prema mjerilima Američke akademije za parodontologiju (American Academy of Periodontology) (27).

Kriterij za uključivanje u studiju bio je dijagnosticirani RA prema smjernicama Američkoga studija za reumatologiju (25) i to najmanje godinu dana prije početka istraživanja. Sudionici nisu smjeli imati nikakve druge autoimune bolesti. A sudionici u kontrolnoj skupini nisu smjeli biti pod dugotrajnom terapijom lijekovima koji utječu na zdravlje parodonta, nisu smjeli imati sistemske bolesti (npr. dijabetes, kardiopatije, autoimune bolesti) te posjedovati medicinsku dokumentaciju u istoj ustanovi kao i pacijenti s dijagnosticiranim RA-om. Kriteriji za isključivanje bili su primjena sistemskih antibiotika ili bilo kakva parodontološka terapija unatrag šest mjeseci, trudnoća i dojenje, pušenje, ortodontska terapija, HIV-pozitivni pacijen-

cytokines interleukin 1 and tumor necrosis factor, in addition to prostaglandins, increase the inflammatory response and stimulate the production of metalloproteinases, with the degradation of connective tissue, in both periodontitis[5] and rheumatoid arthritis (RA) (6,7).

RA is a chronic autoimmune disease characterized by inflammation of the joints, with proliferation of synovial cells and progressive erosion of cartilage and bone. Extra-articular immunological abnormalities may extend to and involve other organ systems (8, 9). RA affects 0.5-1% of the population (10), occurring more commonly between the ages of 30 and 50 years and more often in women than men (about 3:1) (11).

Periodontitis and RA are both chronic inflammatory diseases with similar pathological features. In both conditions, chronic inflammatory reactions occur in a boundary area composed of connective tissue and bone (12). There is increasing evidence to support the notion that both conditions are a result of an imbalance between pro-inflammatory and anti-inflammatory cytokines (13). These similarities have led to various studies on the relationship between RA and periodontitis, although some of the reported data are controversial (14-16).

It is clear that individuals with advanced RA are more likely to experience more significant periodontal problems, compared with their non-RA counterparts (13). A few studies have examined overall oral status and, in particular, periodontal status in subjects with RA (12, 16-23). Despite inconsistent results (14, 21, 22), previous reports have indicated a higher prevalence of periodontal disease among individuals with RA; a relative risk of 4.7 has been suggested (12, 15-19, 24).

The present study examined periodontal conditions and tooth loss in subjects with RA as compared with systemically healthy subjects.

Material and methods

In total, 106 subjects were included (53 RA patients and 53 healthy controls). Subjects with RA were recruited among individuals attending the Public Health Service in Caruaru, Pernambuco, Brazil. RA was diagnosed according to the American College Rheumatology guidelines (25, 26). Periodontal conditions were defined according to the American Academy of Periodontology criteria (27).

Inclusion criteria for the RA subjects were a diagnosis of RA according to the American College Rheumatology guidelines (25) at least 1 year prior to the study and the presence of no other autoimmune disease. Inclusion criteria for the control subjects were no long-term treatment with any medication suspected of affecting the periodontium; no known systemic disease (e.g., diabetes, cardiopathy, autoimmune disease); and no medical records registered in the same place as those of the RA subjects. Excluded from both groups were as follows: those who had received systemic antibiotic treatment or any periodontal treatment in the preceding 6 months; were pregnant or lactating; smoked tobacco; used orthodontic appliances; were HIV-positive; needed antibi-

ti, terapija antibioticima nakon kliničkog pregleda, korištenje vodice za ispiranje usta i odbijanje sudjelovanja. Svi sudionici potpisali su informirani pristanak.

Klinički pregled svih sudionika obavio je kliničar (LMS) koristeći se parodontološkom sondom vrste North Carolina (Trinity®, São Paulo, SP, Brazil). Svaki zub, osim trećih kutnjaka, izmjeren je na šest mjesta (distobukalno, bukalno, meziobukalno, distolingvalno, lingvalno i meziolingvalno). Bilježile su se sljedeće vrijednosti: krvarenje pri sondiranju (BOP) (28), dubina sondiranja (PD), tj. udaljenost od ruba desni do dna sulkusa ili parodontnog džepa, razina kliničkog pričvrstka (CAL), tj.udaljenost od caklinsko-cementnog spojišta ili neke druge određene točke do dna sulkusa ili parodontnog džepa (29), vidljive supragingivne naslage i broj zuba. Zubi koji su manjkali zapisani su, a treći kutnjaci su isključeni.

Stanje parodonta određeno je na temelju stupnja napredovanja bolesti (kronični parodontitis) te je klasificirano prema kriterijima Američke akademije za parodontologiju (American Academy of Periodontology). Prema stupnju napredovanja bolesti razlikuje se lokalizirana bolest s ≤30 posto zahvaćenosti te generalizirana bolest s >30 posto zahvaćenosti. Prema jakosti razlikuje se blaga bolest – CAL 1 do 2 milimetra, umjerena bolest – CAL 2 do 4 milimetra te teška bolest – CAL ≥5 milimetara.

Statistička analiza

Kvantitativni podaci analizirani su koristeći se prosječnom i srednjom vrijednošću te standardnim devijacijama. Vrijednosti za stanje parodonta i gubitak zuba nisu imale normalnu distribuciju nakon obrade Kolmogorov – Smirnovim i Shapiro – Wilksovim testom. Zbog toga je odabran Mann – Whitneyev neparametrijski test kako bi se analizirale povezanosti između varijabla. Upotrebljen je interval pouzdanosti od 95 posto s p-vrijednostima <0,05 kao statistički značajnima. Sve analize obavljene su statističkim paketom SPSS (13.0; SPSS Inc., Chicago, IL, SAD).

Rezultati

U skupini oboljelih od RA bilo je 45 (84,9 %) žena, te njih 49 (92,4 %) u kontrolnoj skupini. Prosječna dob (± SD) bila je 46,8 godina (± 8,5) u skupini oboljelih od RA, te 47,3 (± 7,7) godina u kontrolnoj. Stupanj obrazovanja bio je podjednak. Svi ispitanici s RA-om imali su neku terapiju lijekovima. Sve karakteristike pacijenata nalaze se u tablici 1.

U svakoj je skupini bio uspostavljen pozitivan odnos između dobi pacijenta s gubitkom zuba i veličinom indeksa PD-a, iako se prosječan broj izgubljenih zuba i prosječna veličina PD-a među skupinama nisu bitno razlikovali. Indeksi BOP-a i CAL-a znatno su se razlikovali (p < 0,001 za svaku skupinu) – bili su veći u skupini oboljelih od RA (tablica 2.).

Kronični parodontitis bio je prisutan u obje skupine, no sa znatnom statističkom razlikom u intenzitetu. U skupini pacijenata oboljelih od RA bilo je više slučajeva generaliziranog oblika bolesti (tablica 3.).

otics on clinical examination; used mouthwash; or declined to participate. Written informed consent was provided by all participants.

The clinical examinations were performed by one clinician (LMS), who assessed all subjects using a North Carolina-type periodontal probe (Trinity®, São Paulo, SP, Brazil). Six sites per tooth were evaluated (distobuccal, midbuccal, mesiobuccal, distolingual, midlingual, and mesiolingual), except for third molars. The following were recorded: bleeding on probing (BOP) (28); probing depth (PD), which was the distance from the gingival margin to the base of the gingival sulcus or periodontal pocket; clinical attachment level (CAL), which was the distance from the cemento-enamel junction, or another definite chosen landmark, to the base of the sulcus or periodontal pocket (29); visible dental plaque; and number of teeth present. The number of teeth lost was counted directly; third molars were excluded.

The periodontal condition was diagnosed by considering the extension and severity of disease (chronic periodontitis) and was classified based on the American Academy of Periodontology criteria, according to extension (localized, ≤30% of sites affected; generalized, >30% of sites affected) and severity (slight, 1-2 mm CAL; moderate, 3-4 mm CAL; severe, ≥5 mm CAL) for the entire dentition.

Statistical analysis

Quantitative data were analyzed based on mean, median, and standard deviation. Periodontal condition and tooth loss were not normally distributed based on the Kolmogorov-Smirnov and Shapiro-Wilks tests. Thus, we used the Mann-Whitney non-parametric test to analyze associations between the variables. A 95% confidence interval was used, with p-values <0.05 indicating statistical significance. All analyses were performed using the SPSS statistical package (13.0; SPSS Inc., Chicago, IL, USA).

Results

There were 45 (84.9%) and 49 (92.4%) females in the RA and control groups, respectively. The mean age (± SD) was 46.8 (± 8.5) years in the RA group and 47.3 (± 7.7) years in the control group. The education level was similar between the groups. All patients in the RA group were taking medications. The patient characteristics are shown in Table 1.

In each group, older age was associated with a higher number of teeth lost and with greater PD, although the mean number of teeth lost and mean PD did not differ significantly between the RA and control groups. BOP and CAL were significantly different between the two groups (p < 0.001 for each); with a greater BOP and higher mean CAL in the RA group (Table 2).

Chronic periodontitis was present in both groups, but with a statistically significant difference in extent between the groups. RA patients showed more cases of generalized disease (Table 3).

Tablica 1. Obilježja pacijenata u skupini s reumatoidnim artritisom (RA-om) i u kontrolnoj skupini
Table 1 Patient characteristics in the rheumatoid arthritis (RA) and control groups

Obilježja • Variable	Skupina s RA-om • RA group n (%)	Kontrolna skupina • Control group n (%)
Žene • Female	45 (84.9)	49 (92.4)
Muškarci • Male	8 (15.1)	4 (7.5)
Dob (godine) • Age (years)		
30-39	12 (22.6)	13 (24.6)
40-49	23 (43.4)	19 (35.8)
50-59	15 (28.3)	12 (22.6)
≥60	3 (5.7)	9 (17.0)
Razina obrazovanja • Education level		
- manja od 8-godišnjeg školovanja • <8 years of school	33 (62.3)	23 (43.4)
- 8-godišnje školovanje • 8 years of school	17 (32.1)	10 (18.8)
- viša od 8-godišnjeg školovanja • >8 years of school	3 (5.6)	20 (37.7)
Dohodak u obitelji • Family income		
<1 × mw*	1 (1.9)	0 (0)
>1 i • and <3 × mw	40 (75.5)	45 (85.0)
≥3 × mw	12 (22.6)	8 (15.0)

* mw – minimalna zarada na mjesec od oko 258 američkih dolara • minimum wage per month, about $258.00 US.

Tablica 2. Prosječna i srednja vrijednost te standardna devijacija (SD) indeksa BOP-a, PD-a i CAL-a, te broj izgubljenih zuba u skupini oboljelih od RA i onoj kontrolnoj
Table 2 Mean, median, and standard deviation (SD) of BOP, PD, CAL, and number of teeth lost in the RA and control groups.

Parametri • Parameter	Skupina s RA-om • RA group	Kontrolna skupina • Control group	p - vrijednost* • P value*
BOP (%)			
Minimalni • Mean	73.4	45.6	
Srednji • Median	78.0	44.0	<0.001
SD	17.7	20.5	
PD (mm)			
Minimalni • Mean	2.6	2.5	
Srednji • Median	2.4	2.5	0.91
SD	0.5	0.6	
CAL (mm)			
Minimalni • Mean	1.7	1.3	
Srednji • Median	1.7	1.2	<0.001
SD	0.4	0.8	
Broj izgubljenih zuba • Number of teeth lost			
Minimalni • Mean	12.3	11.2	
Srednji • Median	11.0	4.7	0.57
SD	6.6	10	

* Mann-Whitneyev test, 95 % točnosti • Mann-Whitney test, 95% significance level.
Moguća pogreška u obje skupine (Shapiro – Wilksov test, $p < 0,05$) • Normality of the data was rejected in both groups (Shapiro-Wilks, $p < 0.05$)

Tablica 3. Distribucija dijagnoze parodontitisa u skupini oboljelih od RA i u kontrolnoj skupini
Table 3 Distribution of periodontitis diagnosis in the RA and control groups

Dijagnoza parodontitisa • Periodontitis Diagnosis	Skupina s RA-om • RA group n (%)	Kontrolna skupina • Control group n (%)	p - vrijednost* • P value*
Lokalizirana • Localized	1 (1.9)	23 (43.4)	<0.001
Generalizirana • Generalized	52 (98.1)	30 (56.6)	

* Chi-usklađen test, 95 % točnosti • Chi-squared test, at 95% significance.

Rasprava

Pacijenti s dugotrajnim RA-om imali su viši stupanj parodontnih bolesti i manjkalo im je više zuba (17). U ovom istraživanju ocjenjivalo se zdravlje parodonta i gubitak zuba kod pacijenata s dijagnosticiranim RA-om u usporedbi sa zdravim sudionicima istraživanja, a u obzir su uzeti i dob,

Discussion

Patients with longstanding active RA have been reported to have a substantially increased frequency of periodontal disease, including tooth loss (17). The present study evaluated periodontal condition and tooth loss in RA patients in comparison with healthy subjects, and their association with

spol, prihodi u kućanstvu te školovanje. Dokazana je razlika u stanju parodonta, ali ne i u gubitku zuba između pacijenata s RA-om i zdravih sudionika.

Neka klinička istraživanja upućuju na povezanost parodontitisa i/ili gubitka zuba i RA (39 – 38), iako ni u jednom nije potvrđena povezanosti tih dviju bolesti (22). U većini studija bila je razmjerno niska rasprostranjenost u kontrolnim skupinama (15, 19, 23, 24, 35, 39) u kojima su sudionici često bili dobrovoljci iz ustanova gdje se obavljalo istraživanje (npr. bolničko ili fakultetsko osoblje) (38, 39) ili su to bili pacijenti koji su dolazili liječiti se u određenu kliniku (16,17,19,23,24,33). Kako se većina pacijenata liječi u ambulantama primarne zdravstvene zaštite, oni koji odlaze u klinike ili bolnice ne mogu predstavljati opću populaciju iz koje potječu pacijenti s reumatoidnim artritisom, a bili su uključeni u dosadašnje studije. Takva vrsta odabira mogla je biti odgovorna za pogrešku u procjeni o povezanosti reumatske bolesti i parodontitisa, odnosno gubitka zuba (40).

U ovoj studiji kontrolna je skupina bila sastavljena od sudionika koji su prema socijalno-demografskim čimbenicima, osim razine obrazovanja, bili slični onima u skupini s RA-om. Žene su bile većina u objema skupinama, što se podudaralo s jednom prijašnjom studijom (11). Nisu postojale razlike u obiteljskim dohocima, CAL-u ili BOP-u, što je također bilo u skladu s ranijim podacima (3).

Nije bilo razlika u gubitku zuba između skupine s RA-om i one kontrolne, što nije u skladu s dosadašnjim rezultatima ostalih istraživanja (18, 22, 34, 40) prema kojima su pacijenti u skupini s RA-om imali veći gubitak zuba. To se može pripisati razlikama u dobi pacijenata, različitim metodama istraživanja ili prosječnom vremenu dijagnosticiranja.

Nakon dijagnoze RA slijedi terapija imunoregulatorima, steroidima, nesteroidnim protuupalnim lijekovima ili njihovim kombinacijama. Ti lijekovi mogu utjecati na proizvodnju prostaglandina E2 i na kemotaksu neutrofila na mjestu upale, a to može utjecati na upalu tkiva i gubitak kostiju (9) te se očituje kao gingivitis ili parodontitis (41– 44). Nakon dijagnosticiranja RA trebalo bi pregledati stanje parodonta u skladu s glavnom dijagnozom (20).

Veza između RA i parodontitisa povezana je s imunosnoupalnim profilom, stimulacijom makrofaga, upalnim citokinima i metaloproteinazama koje mogu utjecati na nastanak parodontitisa i gubitak koštane strukture (5, 19). U ovom istraživanju BOP je, kao važan indeks u procjeni stanja parodonta, pokazivao veće vrijednosti u skupini s RA-om, a to upućuje na činjenicu da je bilo mnogo lošije nego u kontrolnoj skupini. To je u skladu s dosadašnjim istraživanjima (20, 24).

Mikrovaskularne promjene parodonta kod pacijenata s RA-om mogu biti povezane s parodontitisom (45). U nekoliko studija istaknuta je povezanost CAL-a i PD-a s RA-om (13, 16, 22, 40, 46). Unatoč svemu, u navedenim istraživanjima nije postavljena dijagnoza parodontitisa, iako je vrlo važna za planiranje terapije i spoznaje o intenzitetu i rasprostranjenosti bolesti.

Većina kliničkih i epidemioloških studija upućuje na povećanu rasprostranjenost parodontitisa i gubitka zuba kod pacijenata s RA-om, ali je i dalje nejasno kolika je (47). U

age, gender, family income, and education level. A difference in periodontal conditions, but not tooth loss, was found between the RA patients and the healthy control subjects.

Some clinical studies have suggested an association between the occurrence of periodontitis and/or tooth loss and RA (30-38), although one study observed no association between these diseases (22). Most of the studies were relatively low-prevalence, case-control studies (15, 19, 23, 24, 35, 39) in which the control subjects were often volunteers recruited from the staff at the study centers (*e.g.*, university or hospital staff) (38, 39) or were patients attending dental clinics (16, 17, 19, 23, 24, 33). As most oral care is administered in the primary care sector, patients attending dental clinics or hospitals are unlikely to represent the general population, which was the source population for patients with rheumatic disease who were included in earlier studies. This selection bias might have resulted in either overestimating or underestimating the association between rheumatic disease and periodontitis/tooth loss (40).

In the present study, the controls were recruited among the companions of the RA patients, and sociodemographic factors, except education level, were similar between the RA and control groups. Females were more prevalent in both groups, in accordance with another study (11). There was no difference in family income, CAL, or BOP, which is consistent with previous data (3).

There was no difference in tooth loss between the RA and control groups in the present study, which is in contrast to other reports (18, 22, 34, and 40) in which RA patients showed more tooth loss. This difference may be due to the different ages of the subjects, different methodologies used, or the mean time of diagnosis in the RA group.

Therapy, including the use of immunoregulators, steroids, non-steroidal anti-inflammatories, and combinations of these, typically begins following the diagnosis of RA. These drugs can affect prostaglandin E2 production and neutrophil chemotaxis at inflammation sites, and could influence tissue inflammation and bone loss (9), which may be reflected in gingivitis and periodontitis (41-44). Given a diagnosis of RA, periodontal conditions should be examined further in this regard (20).

The link between RA and periodontal disease may be related to the immune-inflammatory profile, macrophage stimulation, inflammatory cytokines, or metalloproteinases, which could be involved in bone and connective tissue loss in periodontitis (5, 19). BOP, an important aspect of a periodontal evaluation, was greater in the RA group in the present study, indicating that periodontal conditions were worse in this group than in the control group, which is in agreement with other reports (20, 24).

Microvascular alterations in the periodontium of RA patients may be related to the presence of periodontal disease (45). Several studies have reported an association of CAL and PD with RA (13, 16, 22, 40, 46). However, a periodontal diagnosis was not made in those studies, and a diagnosis is important in planning therapy and providing information on the severity and extent of the disease.

Most clinical and epidemiological studies have indicated an increased prevalence of periodontitis and tooth loss in pa-

ovoj studiji ističe se da pacijenti s RA-om imaju lošije stanje parodonta u usporedbi sa zdravim sudionicima u istraživanju, iako među skupinama nije postojala razlika u gubitku zuba.

Ovo istraživanje ima ograničenja. Kao prvo, mali prihodi i nedovoljno obrazovanje pacijenata uključenih u istraživanje onemogućili su širu primjenu rezultata na populaciju. Broj sudionika u skupinama također je bio malen. Potrebne su usporedne studije kako bi se ustanovila vremenska povezanost između RA i parodontitisa/gubitka zuba (38).

Zaključak

Možemo reći da ovo istraživanje upućuje na povezanost između RA i lošijeg stanja parodonta. Potrebna su daljnja istraživanja kako bi se ustanovilo je li ta povezanost uzročna ili je samo rezultat patogeneze.

tients with RA, but the strength of the association remains unclear (47). The present study shows that RA patients had worse periodontal conditions compared with healthy controls, although there was no difference in tooth loss between the two groups.

This study had some limitations. First, the low income and education levels of the study subjects prevent the results from being generalized. Also, the number of subjects in each group was small. Longitudinal studies are necessary to establish the temporal relationship between RA and periodontitis/tooth loss (38).

Conclusion

In conclusion, the results of this study indicate a correlation between RA and poorer periodontal condition, but further studies are necessary to demonstrate whether this association is causal or is the result of a similar mechanism of pathogenesis.

Abstract

Aim: Periodontal disease and rheumatoid arthritis (RA) have similar underlying pathological processes. Chronic inflammation and immune dysfunction are central to both diseases, and both are modulated by cytokines, as mediators of inflammation. This study evaluated the periodontal condition and tooth loss in RA patients and compared them with systemically healthy patients. **Material and Methods:** In total, 106 subjects participated: 53 with RA and 53 healthy controls, paired by gender and age. We recorded socioeconomic data and information about oral and systemic health. Clinical examinations were performed at six sites per tooth. Bleeding on probing (BOP), probing depth (PD), clinical attachment level (CAL), and total number of teeth were recorded. The diagnosis of the periodontal condition followed the American Academy of Periodontology criteria. RA was diagnosed according to the American College of Rheumatology guidelines. **Results:** The RA group exhibited a significantly higher percentage of BOP and a significantly higher CAL compared with the control group ($p < 0.001$ for each). There was no difference in tooth loss between the groups. **Conclusion:** The RA patients exhibited worse periodontal conditions than systemically healthy patients.

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Key words
Rheumatoid Arthritis; Periodontal Disease; Tooth Loss; Cytokines

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