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IZVORNI ZNANSTVENI RAD
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Prevalencija simptoma i znakova temporomandibularnih poremećaja u bolesnika s posttraumatskim stresnim poremećajem

The Prevalence of Symptoms and Signs of Temporomandibular Dysfunctions in Patients with the Posttraumatic Stress Disorder

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Sažetak

Svrha rada: Svrha studije bila je usporediti prevalenciju simptoma / znakova temporomandibularnih poremećaja (TMP/TMD-a) između skupine oboljelih od posttraumatskoga stresnog poremećaja (PTSP-a) i kontrolne skupine, te ustanoviti razliku u vrijednostima Helkimova anamnestičkog indeksa disfunkcija(Ai-a) i Helkimova kliničkog disfunkcijskog indeksa (Di-a) između zdravih ljudi i pacijenata s dijagnozom PTSP-a. **Ispitanici i postupci:** U prvoj skupini bilo je 38 pacijenata obaju spolova u dobi od 30 do 60 godina, a dijagnozu PTSP-a postavio im je psihijatar. U kontrolnoj skupini bila su 32 muška i ženska ispitanika, također u dobi od 30 do 60 godina. Od svih je uzeta anamneza u skladu s Helkimovim anamnestičkim indeksom disfunkcija i obavljen klinički pregled, također u skladu s tim kliničkim disfunkcijskim indeksom. **Rezultati:** Razlike su ustanovljene kod sljedećih simptoma TMP-a: zvuka u području temporomandibularnog zgloba te umora u području čeljusti i ukočenosti čeljusti, a znakovi TMP-a bili su manja pokretljivost mandibule, smanjena funkcija temporomandibularnih zglobova i bolovi u mišićima. Na temelju izračunavanja Hi-kvadrat testa za vrijednosti Helkimova anamnestičkog indeksa disfunkcija i Helkimova kliničkog disfunkcijskog indeksa, u objema skupinama dokazane su statistički znatne razlike. **Zaključak:** Rezultati ove studije potvrdili su da PTSP utječe na simptome i znakove TMP-a, o čemu je prijeko potrebno voditi računa tijekom liječenja oboljelih od PTSP-a te onih koji pate od TMP-a.

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Ključne riječi
Temporomandibularni zglob, poremećaji

Uvod

Temporomandibularni poremećaji (TMP) označuju bolesti mišića i čeljusnog zgloba, te muskuloskeletne bolesti i često su dio neke sistemske bolesti ili generalizirane fibromijalgije, odnosno nekoga reumatoidnog artritisa. Moramo istaknuti da strah, napetost i stres imaju velik utjecaj na orofacijalni sustav (1). Zbog toga neki autori smatraju da su TMP-i psihofiziološke bolesti koje primarno djeluju na funkciju mišića i čeljusnog zgloba s mogućnošću alteracije zubala (2). Nakon što neki uzročnik prijeđe razinu individualne fiziološke tolerancije mastikatornog sustava on počinje pokazivati određene znakove promjene. One se najčešće događaju na temporomandibularnim zglobovima (TMZ-u), na strukturama zuba i samim zubima. (3)

Najčešći simptomi temporomandibularnih poremećaja/disfunkcija (TMP/TMD-a) jesu: zvuk u području temporomandibularnih zglobova, ukočenost čeljusti, umor u području čeljusti, teškoće pri otvaranju usta, "zaključavanje" donje čeljusti, bolovi u temporomandibularnim zglobovima ili u području mastikatornih mišića te bolovi kod pokreta mandibule i luksacije donje čeljusti. Najčešći znaci temporomandibularnih disfunkcija su manja pokretljivost mandibule, smanjena funkcija temporomandibularnih zglobova, bolovi tijekom pokreta mandibule, bolovi u mišićima i bolovi u području temporomandibularnih zglobova. (4)

Uzročnici TMP-a složeni su i mnogobrojni. Mnogi čimbenici mogu pridonijeti tome poremećaju. U mnogobrojnim se studijama razmatraju utjecaji psihosocijalnih stresova, parafunkcija i drugih psiholoških procesa te ponašanje kod bolova izazvanih temporomandibularnim poremećajem. Na primjer, stres zbog rata povezuje se s takvim tegobama (5), a čak i sasvim blagi stresovi, kao što su jednostavne računske operacije i rješavanje anagrama od pet slova, mogu pojačati aktivnost mastikatornog mišića koja se smatra povezanom s temporomandibularnim poremećajima (6, 7).

Sličan odnos između stresa i temporomandibularnih disfunkcija vrijedi za djecu, mladež i odrasle (8-10). Američka asocijacija psihijatara (11) definira posttraumatski stresni poremećaj (PTSP) kao oblik patološkog odgovora na stres u kojemu pacijent u mislima i snovima redovito analizira doživljene traume te je zato stalno napet. Kao rezultat povećane motoričke aktivnosti i raskida neurotransmitera koji prate PTSP, osobito s obzirom na noradrenalin, serotonin, endogene opijate i hipotalamično-hipofizno-adrenalnu os (12, 13, 14), mogu se očekivati manifestacije

Introduction

Temporomandibular dysfunction (TMD) denotes diseases of the muscles and the mandibular joint, muscular and skeletal diseases, and frequently also parts of systemic diseases of a generalized fibromyalgia, or a form of rheumatoid arthritis. In addition, fear, tension and stressful situations contribute to the overall condition of the masticatory system. (1) Some authors believe that TMD includes pathological diseases primarily affecting the function of muscles and the mandibular muscle, with a possible alteration to the tooth surface. (2) After a cause has crossed the level of individual physiological tolerance of the masticatory system, the system itself starts to respond with certain signs of change. Changes usually happen on the temporomandibular joints (TMJ), supportive tooth structures, and the teeth themselves. (3)

The most frequent symptoms of TMD are found in the area of the temporomandibular joint, a sensation of fatigue in the jaw area, a sensation of stiffness of the jaw upon waking up or when opening the mouth, luxation or locking of the mandible when opening the mouth, pain when opening the mouth, and pain in the region of the temporomandibular joint or in the area of the masticatory muscles (cheeks). The most frequent signs of TMD include restricted mandibular movement, lower TMJ function, painful mandibular movement, muscle pain, and pain in the TMJ. (4)

TMD causes are complex and multi-factorial. Numerous factors may lead to TMD. The influence of psychosocial stressors, parafunctions and other psychological and behavioral processes onTMD pain has been examined in a number of studies. For example, war-related stress has been linked to TMD (5), and stressors as mild as performing mental arithmetic and solving five-letter anagrams can also increase masticatory muscle activity thought to be associated with TMD. (6, 7) Similar relationships between stress and TMD have been reported in children, adolescents and adults. (8, 9, 10) The American Psychiatric Association (11) defines posttraumatic stress disorder (PTSD) as a form of pathological response to stress, in which the patient, through intrusive thoughts and dreams, regularly experiences the trauma suffered, and is consequently placed in a state of permanent increased tension.

As a result of increased motor activity and the neurotransmitter disruptions which accompany PTSD, particularly with regard to noradrenalin, serotonin, endogenic opiates, and the hypothalamic-pituitary-adrenal axis (12, 13, 14), marked manifestations of symptoms and signs of TMD can be expected. (5)

simptoma i znakova TMP-a (5). Hipotalamus, to jest retikularni sustav, a osobito limbički, primarno su odgovorni za emocionalno stanje pojedinca. Ti centri različito utječu na mišićnu aktivnost, a jedan od utjecaja je gama-eferentni put. Stres djeluje na tijelo aktiviranjem hipotalamusa koji odmah priprema organizam na reakciju. Hipotalamus, zbog složenih neuralnih puteva, povećava aktivnost gama-eferentnih vlakana, što uzrokuje kontrakciju intrafuzalnih mišićnih vlakana. To djeluje na mišiće tako da i njihovo najmanje istezanje može prouzročiti refleksnu kontrakciju. Ukupan učinak je porast mišićnoga tonusa. Veća razina emocionalnog stresa ne povećava samo tonus mišića glave i vrata, nego i nefunkcionalnu mišićnu aktivnost kao što je bruksizam ili stiskanje zuba (15). Istaknimo da simpatička aktivnost, tj. simpatički živčani sustav, ima zadatak usmjeriti produženu aktivnost žvačnog sustava na određena tkiva kao što su mišići. Pokazalo se da simpatička aktivnost može povećati mišićni tonus i završiti bolnim stanjem, utječući pritom na simptome i znakove temporomandibularnih disfunkcija (16, 17). Emocionalni stres može djelovati na simptome i znakove temporomandibularnih disfunkcija smanjujući pacijentovu fiziološku toleranciju. To se najvjerojatnije događa zbog povećanja simpatičkog tonusa, što je simpatički odgovor, a on ima važnu ulogu u kroničnoj boli (5).

Svrha je istraživanja bila usporediti prevalenciju simptoma / znakova temporomandibularnih poremećaja (TMP/TMD-a) između skupine ispitanika oboljelih od posttraumatskoga stresnog poremećaja (PTSP-a) i kontrolne skupine; b) ustanoviti razlike u vrijednostima Helkimova anamnestičkog indeksa disfunkcija (Ai-a) i Helkimova kliničkog disfunkcijskog indeksa (Di-a) između zdravih sudionika i pacijenata s dijagnozom PTSP-a.

Ispitanici i postupci

Ispitivanjem su bile obuhvaćene dvije skupine. U prvoj je bilo trideset i osam ispitanika s ratnim traumama - žrtava mučenja obaju spolova u dobi od 30 do 60 godina, a liječili su se u Centru za žrtve rata u Sarajevu. Svima su psihijatri Psihijatrijske klinike Kliničkog centra Sveučilišta u Sarajevu postavili dijagnozu PTSP-a. U postupku određivanja dijagnoze koristili su se Harvardskim traumatskim upitnikom kako bi potvrdili PTSP.

U kontrolnoj skupini bila su slučajno odabrana trideset i dva pacijenta obaju spolova u dobi od 30 do 60 godina, a dolazili su se liječiti u Kliniku za stomatološku protetiku Stomatološkog fakulteta u Sarajevu. Oni su pristali na razgovor sa psihijatrom

The hypothalamus, i.e. the reticular, and particularly the limbic system, are primarily responsible for an individual's emotional state. These centers affect muscular activity in a number of ways, one of which is the gamma-efferent path. Stress affects the body by activating the hypothalamus, which in turn prepares the body for a reaction. Through complex neurological pathways, the hypothalamus increases the activity of gamma-efferent fibers, causing the contraction of intrafusal fiber in the muscle spindle. This sensitizes the muscle spindle enough that a minor extension may cause a reflex contraction. The overall effect is increased muscle tone. An increased level of emotional stress increases the muscle tone not only in the head and neck muscles, but can also increase the level of non-functional muscle activity, such as bruxism and teeth clenching. (15) The sympathetic system activity, i.e. the sympathetic system, also plays a role. Extended activity of the sympathetic masticatory system may affect certain fibers, such as muscles. Sympathetic activity has been proved to increase muscle tone, leading to a sensation of muscular pain, affecting the symptoms and signs of temporomandibular dysfunction. (16, 17) Emotional stress can also affect the signs and symptoms of temporomandibular dysfunctions by decreasing the patient's physiological tolerance. This is possibly caused by an increase in the sympathetic tone, rendering the sympathetic response, which plays an important role in chronic pain. (5)

The aims of this research are: to compare the prevalence of TMD symptoms/ signs in PTSD group and non-PTSD matched control; to determine differences in values of Helkimo Anamnestic Dysfunction Index (Ai) and Helkimo Clinical Dysfunction Index (Di) between healthy and PTSD patients.

Material and methods

The study included two groups of patients. The first group included thirty-eight subjects of both sexes, aged between 30 and 60, survivors of war trauma and torture, treated at the Centre for War Torture Victims in Sarajevo. All the patients were diagnosed with PTSD by the psychiatrists of the Psychiatric Clinic, University Hospital Sarajevo. During the investigation psychiatrists carried out psychiatric diagnosis by means of the Harvard trauma questionnaire, in order to confirm PTSD.

The second group, the control, was established as a random sample of thirty-two patients of both sexes, aged 30 to 60, and treated by the Dental Prosthetics Clinic of the School of Dental Medicine,

i testiranje odgovarajućim instrumentima istraživanja, kako bi bilo sigurno da nemaju simptome posttraumatskoga stresnog poremećaja.

Nakon toga je od svih sudionika iz obiju skupina uzeta anamneza u skladu s Helkimovim anamnestičkim indeksom disfunkcija i obavljen klinički pregled također u skladu s Helkimovim kliničkim disfunkcijskim indeksom. Na osnovi anamnestičkih podataka stručnjaci su dobili podatke o simptomima temporomandibularne disfunkcije, a kliničkim ispitivanjem utvrđeni su znakovi tih poremećaja.

Anamnestičko ispitivanje prema Helkimovu anamnestičkom indeksu disfunkcija obavljeno je na temelju upitnika te su ispitanici odgovarali s „da“ ili „ne “.

Prema dobivenim podacima pacijenti su bili klasificirani u „anamnestičko disfunkcijske indekse Ai: 0, I i II“, (Tablica 1.).

Bilo je obavljeno i kliničko ispitivanje stomatognatog sustava u skladu s Helkimovim kliničkim indeksom disfunkcija. Riječ je o indeksu koji je za klinički vidljivu disfunkciju stomatognatog sistema oblikovan na osnovi pet znakova TMP-a: smanjenoj granici pokretljivosti mandibule (Tablica 2.), smanjenoj funkciji TMZ-a (procjenu šumova, pucketanja i trenja u zglobu obavljao je ispitivač, ali se nije koristio stetoskopom), bolova kod pokreta mandibule, bolova u mišićima (sljedeća područja bila su rutinski palpirana: m. masseter profundus, m. masseter superficialis, m. temporalis-pars anterior, medialis, posterior te insercija na koronoidnom nastavku, m. pterygoideus lateralis, m. pterygoideus medialis) te bolova u TMZ-u. Odlučujući u skladu s trostupanjskom ljestvicom akutnosti, svakom od navedenih pet znakova dodijeljeno je : 0 bodova ako nema simptoma; 1 bod za blagi simptom; 5 bodova za akutni simptom.

Dakle, TMP je definiran kao prisutnost jednoga od pet navedenih znakova.

Rezultati dodijeljeni za pet simptoma su zajednički. Tako je svaki pojedinac imao ukupan rezultat disfunkcija u rasponu od 0 do 25 bodova. Što je taj rezultat bio veći, to je poremećaj bio akutniji i ozbiljniji.

Ovisno o dobivenim vrijednostima ispitanici su klasificirani na sljedeći način:

Di 0 = Helkimov disfunkcijski indeks 0 = 0 bodova = klinički bez simptoma

Di I = Helkimov disfunkcijski indeks 1 = 1 do 4 boda = blaga disfunkcija

Di II = Helkimov disfunkcijski indeks 2 = 5 do 9 bodova = umjerena disfunkcija

Di III = Helkimov disfunkcijski indeks 3 do 5 = 10 do 25 bodova = akutna/ozbiljna disfunkcija.

University of Sarajevo. With their consent, subjects in the control group underwent psychiatric interviews and tests with relevant research instruments, in order to confirm that these patients presented no symptoms of PTSD.

Furthermore, both groups of patients had their history taken using the Helkimo anamnestic dysfunction index, and clinical examinations were conducted in compliance with the Helkimo clinical dysfunction index. Case histories rendered the information on symptoms of TMD and clinical tests determined the signs of these disorders.

Anamnestic tests using the Helkimo anamnestic dysfunction index was performed using yes-no questionnaires.

The information thus obtained allowed the patients to be classified as anamnestically dysfunctional indexes Ai: 0, I and II. (Table 1)

After that, a clinical test of their masticatory system was conducted in compliance with the Helkimo clinical dysfunction index. This is an index which examines the clinically visible dysfunction of the stomatognatic system on the basis of five signs of TMD: restricted maximum movement of the mandible (Table 2.), restricted TMJ function (the presence of murmur, crackle and traction in the joint was assessed by the examiner without using a stethoscope), painful mandibular movement, muscle pain (the following bilateral areas were subject to routine palpatory examination: *m. masseter profundus, m. masseter superficialis, m. temporalis-pars anterior, medialis, posterior*, and insertion at the coronoid process, *m. pterygoideus lateralis, m. pterygoideus medialis*), and painful TMJ. Scores were determined in compliance with a three-level scale of acuteness, the following score was assigned: 0 points for absence of symptoms, 1 point for mild pain, 5 points for an acute symptom. TMD was defined as the presence of one of the five signs cited. Scores assigned for the five symptoms were summed up. Each individual had a total dysfunction score ranging from 0 to 25 points. The higher the score, the more acute/serious the disorder.

Depending on the values obtained, the subjects were classified as follows:

Di 0 = Helkimo dysfunction index 0 = 0 points = no clinical symptoms,

Di I = Helkimo dysfunction index 1 = 1 – 4 points = mild dysfunction,

Di II = Helkimo dysfunction index 2 = 5 – 9 points = moderate dysfunction,

Di III = Helkimo dysfunction index 3 – 5 = 10 – 25 points = acute/serious dysfunction.

Rezultati su statistički analizirani u programu SPSS-a. Za varijable s vrijednostima izraženima u kategorijama i frekvenciji, izračunata je velika razlika između skupina i to uporabom Fisherova egzaktnog testa i Hi-kvadrat testa.

The results were statistically analyzed in the program SPSS. For the variables whose values were expressed in categories and frequencies, we calculated and tested the significance of the difference between groups, and this was carried out by Fisher's exact test chi-square test.

Tablica 1. Anamnestički upitnik
Table 1 Statistically significant differences are marked amber in the table.

Ime i prezime • Name and surname:			
Datum rođenja • Date of birth:			
Spol • Gender:		M	Ž • F
Zanimanje • Occupation:			
Adresa i broj telefona • Address and phone:			
1.	Imate li zvuk u području temporomandibularnih zglobova • Do you have a sound in the area temporomandibular joints	DA • YES	NE • NO
2.	Je li vam ukočena vilica kad se probudite ili možda teško pokrećete donju vilicu • Do you have jaw rigidity during awakening or slow movement of mandible	DA • YES	NE • NO
3.	Imate li osjećaj umora u području čeljusti • Do you feel fatigue in the jaw area	DA • YES	NE • NO
4.	Imate li poteškoće kod otvaranja usta • Do you have difficulty when opening the mouth	DA • YES	NE • NO
5.	Imate li zaključavanje vilica tijekom otvaranja usta • Do you have locked mandible during opening the mouth	DA • YES	NE • NO
6.	Imate li bolove u TMZ-u ili u području žvačnih mišića • Do you have pain in the TMJ or in the area of masticatory muscles	DA • YES	NE • NO
7.	Imate li bolove dok pokrećete donju vilicu • Do you have pain during movement of the mandible	DA • YES	NE • NO
8.	Imate li iščašenje donje vilice • Do you have luxation of the mandible	DA • YES	NE • NO

Legenda • Legend:
Ai 0 odnosio se na pacijente koji prema anamnezi nisu imali nikakve simptome disfunkcije u mastikatornom sistemu. Ti pojedinci nisu prijavili ni jedan od simptoma navedenih pod AiI i AiII. •
Ai0 comprised individuals who according to anamnesis were free of any simpthoms of dysfunction in masticatory sistem.They had not reported any of symptoms in AiI and AiII.
Ai I odnosio se na pacijente s blagim simptomima disfunkcija: imali su zvukove u području temporomandibularnog zgloba, osjećaj umora u području čeljusti, osjećaj ukočenosti čeljusti nakon buđenja ili pokretanja donje čeljusti. Nije bio prijavljen ni jedan od navedenih simptoma pod AiII. •
AiI comprised individuals with mild symptoms of dysfunction. They had reported that they had one or more of following symptoms: TMJ sounds, feeling of fatigue of the jaws, feeling of stiffness of the jaws on awakening or on movements of the lower jaw. None of the symptoms given under AiII were reported.
Ai II odnosio se na pacijente za koje se ustanovilo da imaju akutne simptome disfunkcija. Dok su davali anamnestičke podatke opisali su kao česte jedan ili više simptoma: poteškoće kod otvaranja usta, zaključavanje, luksacija, bolovi kod pokreta mandibule, bolovi u predjelu temporomandibularnog zgloba ili mastikatornih mišića (obrazi). •
AiII comprised individuals judged as having severe symptoms of dysfunction. When reporting their hystory they had described one or more of the following symptoms as common: difficulties in opening the mouth wide, locking, luxacions, pain on movement of mandible, pain in region of TMJ or of the masticatory muscle (cheeks).

Tablica 2. Indeks pokretljivosti mandibule
Table 2 Mandibular mobility index.

A. Maksimalno otvaranje usta* • A. Maximal opening of mouth*	
> 40 mm	0
30-39 mm	1
< 30 mm	5
B. Maksimalni lateralani pokret udesno • B. Maximal lateral movement to the right	
≥ 7 mm	0
4-6 mm	1
0-3 mm	5
C. Maksimalni lateralani pokret ulijevo • C. Maximal lateral movement to the left	
≥ 7 mm	0
4-6 mm	1
0-3 mm	5
D. Maksimalna protruzija • D. Maximal protrusion	
≥ 7 mm	0
4-6 mm	1
0-3 mm	5
E. Zbroj A + B + C + D • E. Sum A + B + C + D	
F. Indeks pokretljivosti u skladu s ljestvicom • F. Mobility index according to code	

Legenda • Legend:
0 bodova = indeks pokretljivosti **0** = normalna pokretljivost mandibule •
0 points = Mobility index **0** = normal mandibular mobility
1-4 boda = indeks pokretljivosti **1** = neznatno smanjena pokretljivost mandibule •
1-4 points = Mobility index **1** = slightly impaired mobility
5-20 bodova = indeks pokretljivosti **5** = ozbiljno smanjena pokretljivost mandibule
5-20 points = Mobility index **5** = severely impaired mobility
* Maksimalni razmak između vrhova inciziva + vertikalni preklop •
* Max.distance between edges of incisors + vertical overbite

Rezultati

Istraživanje je odgovorilo na pitanje postoje li razlike u frekvenciji pojedinih simptoma između ispitanika s posttraumatskim stresnim poremećajem i zdravih sudionika.

Od svih subjektivnih simptoma svi ispitanici – i oni s PTSP-om (58%) i oni zdravi (31%) – isticali su zvuk u području TMZ-a.

Ukočenost čeljusti ustanovljena je kod 6% ispitanika bez PTSP-a i kod 32% ispitanika s PTSP-om. Na umor u području čeljusti žalilo se 3% ispitanika bez PTSP-a i 42% onih s PTSP-om. Teškoće pri otvaranju usta isticalo je 3% ispitanika bez PTSP-a i 18% oboljelih od PTSP-a.

Bolove kod pokreta mandibule, «zaključavanje» i/ili luksaciju donje čeljusti nije prijavio ni jedan ispitanik. Bolova u TMZ-u ili u području mastikatornih mišića nije bilo kod ispitanika bez PTSP-a, a na njih se žalilo 11% ispitanika s PTSP-om (Tablica 3.).

Usporedbom učestalosti pojedinih simptoma u objema skupinama ispitanika, ustanovljene su statistički velike razlike kad je riječ o sljedećim simptomima: zvuku u području temporomandibularnog zgloba, umoru u području čeljusti i ukočenosti čeljusti. Sve je to bilo češće kod ispitanika s posttraumatskim stresnim poremećajem, (Tablica 3.) .

U skladu s Helkimovim anamnestičkim indeksom disfunkcija ustanovljeno je da 69% ispitanika

Results

Subjective symptoms were addressed in the research by determining the differences in the frequency of certain symptoms between the PTSD-affected group and the healthy group.

Out of all the subjective symptoms, the presence of sound in the area of TMJ was reported by the majority of non-PTSD-affected patients (31%), as well as by the PTSD-affected ones (58%).

Jaw rigidity was confirmed in 6% subjects with no PTSD, and in 32% of subjects with PTSD. Fatigue of the jaw was confirmed in 3% of subjects with no PTSD and in 42% of subjects with PTSD.

Difficulties in opening of the mouth were confirmed in 3% of subjects without PTSD and in 18% of subjects with PTSD.

Locking and/or luxation of the jaw was not reported by any of the subjects.

Pain in the TMJ or the area of masticatory muscles was not confirmed in any of the subjects without PTSD, but it was confirmed in 11% of the subjects with PTSD (Table 3).

A comparison of frequency of individual symptoms in the two groups revealed significant differences to the following symptoms: sound in the area of the temporomandibular joint, fatigue of the jaw, and rigidity of the jaw. All the differences show an

Tablica 3. Učestalost simptoma TMP-a prema Helkimovu anamnestičkom indeksu disfunkcija (Ai) s obzirom na skupinu ispitanika. Rezultati Fisherova egzaktnog testa tijekom ispitivanja razlika među skupinama ispitanika s obzirom na frekvenciju subjektivnih simptoma

Table 3 Frequency of symptoms of TMD according to the Helkimo anamnestic dysfunction index (Ai) by subject group. Results of Fisher's exact test applied to differences between the subject groups in relation to frequency of subjective symptoms.

	Skupina • Group				Fisherov egzaktni test • Fisher's Exact Test
	Zdravi • Healthy		PTSP • PTSD		
	N	%	N	%	Egzaktno Sig. (2-strano) • Exact Sig. (2-sided)
Zvuk u području TMZ-a • Sound in the TMJ area	10	31	22	58	0.032
Ukočenost čeljusti • Jaw rigidity	2	6	12	32	0.014
Umor u području čeljusti • Fatigue in the jaw area	1	3	16	42	0.01
Teškoće kod otvaranja usta • Difficulty when opening the mouth	1	3	7	18	0.063
Zaključavanje donje čeljusti • Locked mandible	0	0	0	0	
Bolovi u TMZ-u ili u području mastikatornih mišića • Pain in the TMJ or in the area of masticatory muscles	0	0	4	11	0.120
Bolovi tijekom pokreta mandibule • Pain during mandible movement	0	0	0	0	-
Luksacije donje čeljusti • Luxation of the mandible	0	0	0	0	-
Ukupno ispitanika • Total subjects	32	100	38	100	-

bez PTSP-a i 34% s PTSP-om nisu imali nikakvih subjektivnih simptoma TMP-a, što znači da im je Helkimov anamnestički indeks bio nula - Ai0. Dvadeset i osam posto ispitanika bez PTSP-a i 37% s PTSP-om imali su blage subjektivne simptome, što znači da im je Helkimov anamnestički indeks iznosio jedan - Ai I.

Tri posto ispitanika bez PTSP-a i 29% s PTSP-om imali su akutne subjektivne simptome TMP-a, što znači da su imali Helkimov anamnestički indeks dva - Ai II, (Tablica 4.).

Naknadnim izračunavanjem Hi-kvadrat testa za kategorijalne vrijednosti varijable Helkimova amnestičkog indeksa Ai 0, I, II, ustanovljeno je da među ispitanicima kontrolne skupine nema statistički značajno više ispitanika s anamnestičkim indeksom 0 (to jest onih bez simptoma) negoli među ispitanicima s PTSP-om. Kad je riječ o Helkimovu anamnestičkom indeksu Ai I (blagi simptomi), nema statistički velike razlike među različitim skupinama. Kod ispitanika s PTSP-om bilo je statistički znatno više ispitanika s Helkimovim anamnestičkim indeksom Ai II (onih s akutnim simptomima) nego među zdravima (Tablica 4.).

increased frequency of the symptoms in subjects with PTSD. (Table 3)

Pursuant to the Helkimo anamnestic dysfunction index, it was found that 69% of the subjects without PTSD and 34% with PTSD had no subjective TMD symptoms, meaning that their Helkimo anamnestic dysfunction index was zero, Ai 0. 28% of the subjects with PTSD and 37% of the subjects with PTSD had mild subjective symptoms, meaning that they had the Helkimo anamnestic dysfunction index one, Ai I. 3% of the subjects without PTSD and 29% of those with PTSD had acute subjective TMD symptoms, meaning that they fell within Helkimo anamnestic dysfunction index two, Ai II. (Table 4)

An additional calculation of the chi-square test for the category-based values of the variable of the Helkimo anamnestic dysfunction index, Ai 0, I, II yielded the following: among the control group, there was no statistically greater prevalence of subjects falling within Helkimo anamnestic dysfunction index Ai 0 (those without symptoms) than among subjects with PTSD. As for Helkimo anamnestic dysfunction index Ai I (those with mild symptoms), there is no statistically significant difference

Tablica 4. Razlike između ispitanika bez PTSP-a i onih s PTSP-om u odnosu prema vrijednostima Helkimova anamnestičkog indeksa disfunkcija (Ai-a). Rezultati Hi-kvadrat testa tijekom ispitivanja razlika između skupina ispitanika s PTSP-om i onih bez PTSP-a, s obzirom na Helkimov anamnestički indeks (Ai).

Table 4 Differences between subjects without PTSD and subjects with PTSD in relation to values of the Helkimo anamnestic dysfunction index, (Ai). Results of the chi-square test applied to test the differences between subjects with PTSD and subjects without PTSD in relation to the Helkimo anamnestic dysfunction index, (Ai).

Helkimov anamnestički indeks disfunkcija(Ai) • Helkimo anamnestic dysfunction index (Ai)	Skupina • Group				Hi-kvadrat test • Chi-square test
	Zdravi • Healthy		PTSP • PTSD		
	N	%	N	%	p
0	22	69	13	34	.128
1	9	28	14	37	.297
2	1	3	11	29	.004
Ukupno ispitanika • Total	32	100	38	100	-

Kako bi se ispitale razlike između dviju skupina u odnosu prema Helkimovu anamnestičkom indeksu disfunkcija, izračunat je Hi-kvadrat test koji se pokazao statistički značajnim, (p=0,003).

Na isti način kao i za subjektivne simptome, ispitana je razlika u frekvenciji znakova temporomandibularnih disfunkcija (objektivnih simptoma), s obzirom na to pripadaju li ispitanici skupini s PTSP-om ili kontrolnoj.

Helkimov klinički disfunkcijski indeks izračunat je na temelju pet znakova. To su: smanjena granica pokretljivosti mandibule, smanjena funkcija TMZ-a, bolovi tijekom pokreta mandibule, bolovi u TMZ-u i bolovi u mišićima.

between the groups. As for subjects with PTSD, a larger number of subjects falls into Helkimo anamnestic dysfunction index Ai II (i.e. those with acute symptoms) than among the healthy ones, (Table 4).

In order to test the differences between the two groups of subjects in terms of the Helkimo anamnestic dysfunction index, a chi-square test was calculated, which proved to be statistically significant, (p=0,003)

As with the subjective symptoms, the difference in the frequency of signs of TMD (objective symptoms) was tested for the group with PTSD and the group without PTSD.

Normalnu pokretljivost mandibule imalo je 72% ispitanika bez PTSP-a i 29% onih s PTSP-om. Blago smanjena pokretljivost zabilježena je bila kod 28% ispitanika bez PTSP-a i 63% s PTSP-om. Ozbiljno smanjenu pokretljivost mandibule nije imao ni jedan ispitanik bez PTSP-a, a pronađena je kod 8% ispitanika s PTSP-om.

Normalnu funkciju TMZ-a imalo je 84% ispitanika bez PTSP-a i 58% njih s PTSP-om, blago smanjena je bila kod 16% ispitanika bez PTSP-a i kod 42% oboljelih od toga poremećaja. Ni jedan ispitanik, bez obzira na skupinu, nije imao akutno smanjenu funkciju TMZ-a.

Bolove u mišićima nije imao nitko iz kontrolne skupine, dok se na njih žalilo 34% ispitanika s PTSP-om. Ti su se bolovi javljali u jednom do triju područja palpacije.

Neosjetljivost TMZ-a na palpaciju ustanovljena je kod 97% ispitanika bez PTSP-a i kod 76% onih s PTSP-om. Osjetljivost na palpaciju lateralno u odnosu prema TMZ-u javila se kod 3% ispitanika bez PTSP-a, ali i kod 16% ispitanika s PTSP-om.

Osjetljivost na palpaciju TMZ-a preko vanjskoga slušnog kanala bila je zabilježena kod 8% ispitanika s PTSP-om. Bolove kod pokreta mandibule nije imao ni jedan ispitanik bez PTSP-a, a odsutnost bolova ustanovljena je i kod 90% onih s PTSP-om. Bolovi tijekom jednog pokreta mandibule javili su se kod 5% ispitanika s PTSP-om, a isti postotak sudionika imao je bolove kod dva ili više pokreta mandibule (Tablica 5.).

Kad je riječ o objektivnim simptomima, statistički se velika razlika među skupinama može pripisati sljedećim znakovima TMP-a: smanjenoj pokretljivosti mandibule, smanjenoj funkciji temporomandibularnih zglobova i bolovima u mišićima (Tablica 5.).

Helkimov klinički disfunkcijski indeks određen je u skladu s ukupnim brojem bodova disfunkcija i klasifikacijom disfunkcija u svakoj skupini. Tako 18% ispitanika s PTSP-om nije imalo kliničke znakove disfunkcija (Di 0) u usporedbi s 56% sudionika u kontrolnoj skupini.

Blage (DI I) znakove disfunkcija imao je 61% ispitanika s PTSP-om, a umjerene (DI II)) 21% . Nitko od ispitanika s PTSP-om nije imao ozbiljne kliničke znakove disfunkcija (Di III). U kontrolnoj skupini 44% ispitanika imalo je blage kliničke znakove disfunkcija. Nitko iz te skupine nije imao umjerene i ozbiljne poremećaje. (Tablica 6.) Naknadne analize Hi-kvadrat testa pojedinih kategorijalnih vrijednosti varijabli disfunkcijskog indeksa - Di 0, 1, II, poka-

The Helkimo Clinical dysfunction index is calculated on the basis of five signs. The following are analyzed: impaired range of mandibular movement, impaired TMJ function, pain during the mandibular movement, TMJ and muscle pain.

Normal mandibular movement was confirmed for 72% of the subjects without PTSD and 29% subjects with PTSD. Mildly restricted movement was confirmed for 28% of the subjects without PTSD and 63% of those with PTSD, whereas seriously restricted mandibular movement was confirmed for no subjects without PTSD, but was confirmed for 8% of the subjects with PTSD.

Normal TMJ function was found in 84% of the subjects without PTSD and 58% of the subjects with PTSD. Mildly restricted TMJ function was found in 16% of the subjects without PTSD and 42% with PTSD, and no subject from either group presented an acutely reduced TMJ function.

Muscular pain was presented by no subject from the control group, whereas it was found in 34% of the subjects with PTSD. This pain was confirmed in 1 to 3 areas of palpation. Palpation confirmed no-response for TMJ in 97% of the subjects without PTSD and in 76% of the subjects with PTSD. Lateral sensitivity to palpation in relation to TMJ was found in 3% of the subjects without PTSD, but was found in 16% of the subjects with PTSD. Sensitivity to TMJ palpation through the external auditory canal was found in 8% of the subjects with PTSD. Painful mandibular movement was not found in any of the subjects without PTSD, and absence of pain was confirmed for 90% of the subjects with PTSD. 5% of the subjects with PTSD experienced pain in a single movement of the mandible. The same percentage reported pain in two or more movements, (Table 5).

Significant differences between the two groups of subjects may be assigned to the following signs of TMD: decreased movement of mandible, decreased TMJ function and muscle pain, (Table 5).

The Helkimo clinical dysfunction index was determined in accordance with the total number of dysfunction scores and classification in each dysfunction group. 18% had no clinical signs of dysfunction (Di 0), compared with 56% of subjects in the control group.

61% of the subjects with PTSD had mild (Di I), 21% had moderate (Di II), and none had severe clinical signs (Di III). 44% of the subjects in the control group had mild clinical signs of dysfunction. No subjects in the control group had moderate or severe dysfunctions, (Table 6).

Tablica 5. Frekvencije znakova temporomandibularnih disfunkcija prema Helkimovu kliničkom disfunkcijskom indeksu s obzirom na skupinu ispitanika. Rezultati Hi-kvadrat testa tijekom ispitivanja razlika između skupine ispitanika s obzirom na frekvenciju znakova TMP-a.

Table 5 Frequency of signs of TMD according to the Helkimo clinical dysfunction index (Di) in relation to groups. Results of the chi-square test applied to test the differences between the subject groups in relation to the frequency of signs of TMD.

		Skupina • Group				Hi-kvadrat test • Chi-square
		Zdravi • Healthy		PTSP • PTSD		
		N	%	N	%	p
Indeks pokretljivosti mandibule • Mandibular movement index	Normalna pokretljivost mandibule • Normal mobility of the mandible	23	72	11	29	0.01
	Blago smanjena pokretljivost mandibule • Mildly decreased movement of the mandible	9	28	24	63	
	Ozbiljno smanjena pokretljivost mandibule • Seriously decreased movement of the mandible	0	0	3	8	
Smanjena funkcija TMZ-a • Decreased TMJ function	Odsutnost znakova • No signs	27	84	22	58	0.02
	Blagi znak • A mild sign	5	16	16	42	
Bolovi u mišićima • Muscle pain	Odsutnost znakova • No signs	32	100	25	66	0.01
	Blagi znak • A mild sign	0	0	13	34	
Bolovi u TMZ-u • TMJ pain	Odsutnost znakova • No signs	31	97	29	76	0.05
	Blagi znak • A mild sign	1	3	6	16	
	Akutni znak • An acute sign	0	0	3	8	
Bolovi kod pokretanja mandibule • Painful movement of the mandible	Odsutnost znakova • No signs	32	100	34	90	0.17
	Blagi znak • A mild sign	0	0	2	5	
	Akutni znak • An acute sign	0	0	2	5	

Tablica 6. Frekvencije ispitanika s obzirom na Helkimov disfunkcijski indeks prema skupinama ispitanika. Rezultati Hi-kvadrat testa tijekom ispitivanja razlika između skupina s PTSP-om i bez PTSP-a, s obzirom na Helkimov klinički disfunkcijski indeks(Di).

Table 6 Frequency of subjects in relation to the Helkimo clinical dysfunction index (Di), by group. Results of the chi-square test applied to test the differences between subjects with PTSD and subjects without PTSD in relation to the Helkimo clinical dysfunction index (Di).

Helkimov klinički disfunkcijski indeks (Di) • Helkimo clinical dysfunction index (Di)	Skupina • Group				Hi-kvadrat test • Chi-square test
	Zdravi • Healthy		PTSP • PTSD		
	N	%	N	%	p
Klinički bez simptoma • No clinical symptoms	18	56	7	18	.028
Blaga disfunkcija • Mild dysfunction	14	44	23	61	.139
Umjerena disfunkcija • Moderate dysfunction	0	0	8	21	-
Ukupno ispitanika • Total	32	100.0	38	100	-

zale su velike razlike kad je riječ o ispitanicima koji ne pokazuju simptome, te vidimo da je takvih ispitanika mnogo više među zdravima, nego među ispitanicima s posttraumatskim stresnim poremećajem.

Rezultati Hi-kvadrat testa - nakon ispitivanja razlika između ispitanika s PTSP-om i onih bez toga poremećaja, a s obzirom na disfunkcijski indeks - ne mogu se izračunati, jer svi oni s diskfunkcijskim indeksom dva (Di II) imaju i PTSP, a njih je samo osam (Tablica 6.). Nakon rezultata za Helkimov klinički disfunkcijski indeks izračunat je Hi-kvadrat test kako bismo ustanovili postoje li razlike u disfunkcijskom indeksu između različitih skupina ispi-

Additional analyses of the chi-square test of individual category values of variables of the Helkimo clinical dysfunction index, Di 0, I, II, demonstrated that there are significantly more subjects who present no symptoms in the control group than in the group with PTSD.

The results of the chi-square test used to test the differences between subjects with PTSD and those without PTSD, in light of the Helkimo clinical dysfunction index, cannot be calculated, because there were only 8 subjects with PTSD that fell within Helkimo clinical dysfunction index, Di II, (Table 6).

tanika. Hi-kvadrat test pokazao je statistički značajne razlike između dviju skupina (p=0,001).

Rasprava

Evaluacija funkcijskih mogućnosti stomatognatog sustava obavljena je uporabom Helkimova anamnestičkog indeksa disfunkcija i Helkimova kliničkog indeksa disfunkcija (4).

Mora se istaknuti da se ti indeksi smatraju jako korisnima i, bez obzira na kritike, preporučuju se za epidemiološka istraživanja (18-21), no novim se indeksima pokušalo ukloniti nedostatke Helkimova indeksa. (22, 23)

U ovom su istraživanju Helkimovim anamnestičkim indeksom ustanovljeni simptomi, to jest prevalencija subjektivnih simptoma TMP-a kod skupine s PTSP-om i kod kontrolne skupine. Neke od simptoma TMP-a imalo je 66% ispitanika s PTSP-om i 31% ispitanika iz kontrolne skupine. U objema skupinama ustanovljeno je da je zvuk u području TMZ-a bio najčešći simptom.

Rezultati su potvrdili ranija istraživanja Engermarka i suradnika (24) te Mazenge i sur. (25) koji su ustanovili da je zvuk u području temporomandibularnih zglobova najčešći anamnestički simptom.

Egermark i suradnici (24) te Magnusson i sur. (26) u svojim istraživanjima zaključuju da je zvuk u području temporomandibularnih zglobova važan pokazatelj temporomandibularne disfunkcije.

Magnusson je sa suradnicima (27) zaključio da zvuk u temporomandibularnim zglobovima nije indikacija za medicinski tretman, te je veliko pitanje treba li se zvuk bez bolova smatrati znakom ili simptomom temporomandibularne disfunkcije.

Nurallah i Johanson (28), Okeson (29), Stanišić-Sinobad (30) te, Bumann i Lotzmann (31) navode da se zvuk može pojaviti i bez bolova ili evidentnih bolesti i poremećaja u mišićima ili TMZ-u.

Bolovi su zabilježeni kod 11% ispitanika s PTSP-om, a kod onih iz kontrolne skupine nisu bili prijavljeni, što se može objasniti utjecajem PTSP-a i potkrijepiti podacima iz literature koji upućuju na to da su bolovi često povezani sa stresom (32).

Za simptome TMP-a – zvuk u području TMZ-a, umor u području čeljusti i ukočenost čeljusti - ustanovljena je statistički znatna razlika među skupinama. To znači da su o spomenutim simptomima stati-

After the calculation of the Helkimo anamnestic dysfunction and Helkimo clinical dysfunction indices, the chi-square test was calculated in order to determine any differences in the Helkimo clinical dysfunction index between the two groups of subjects. The chi-square showed statistically significant differences between the two groups, (p=0,001).

Discussion

Evaluation of functional capabilities of the masticatory system was performed using the Helkimo anamnestic dysfunction index and the Helkimo clinical dysfunction index. (4)

It should be noted that the Helkimo index is considered useful and is recommended for epidemiological research (18, 19, 20), despite criticism (21), and the design of new indices without the shortcomings of the Helkimo index. (22, 23)

In this article, the Helkimo anamnestic dysfunction index established the prevalence of subjective symptoms of TMD in both groups.

66% of the subjects with PTSD and 31% of the subjects in the control group had one of the TMD symptoms. Both groups confirmed that sound in the TMJ region was the most frequent symptom.

The results confirmed earlier research, Engermark et al (24) Mazengo et al (25), which showed that sound in the joint area was the most frequent anamnestic symptom.

In their research, Egermark et al (24), and Magnusson et al (26), concluded that sound in the area of temporomandibular joints was a significant predictor of TMD.

Magnusson et al (27) stated that sound in the TMJ was not an indication that medical treatment was required, and there is still uncertainty whether sound, with or without pain, should be considered a sign or a symptom of TMD.

Nurallah and Johanson (28), Okeson (29), Stanišić-Sinobad (30), Bumann and Lotzmann (31), stated that sound may appear with or without the presence of pain or evident diseases and distress in the muscles or the TMJ region.

Pain was found in 11% of the subjects with PTSD, whereas subjects in the control group indicated no pain, which can be explained by the impact of PTSD, substantiated by reference sources indicating that pain is often associated with exposure to stress. (32)

For the symptoms of TMD: sound in the area of TMJ, fatigue in the jaw area and jaw rigidity significant difference was found between the two groups.

stički mnogo češće izvještavali ispitanici s PTSP-om nego oni iz kontrolne skupine. Takav nalaz uglavnom odgovara rezultatima Uhača i suradnika (5) o frekvenciji simptoma.

Statistički znatna razlika između ispitivanih skupina ustanovljena je za kategorijalnu vrijednost varijable Ai II Helkimova anamnestičkog indeksa, a za kategorijalne vrijednosti varijable Ai 0 i Ai i Helkimova anamnestičkog indeksa takva razlika nije ustanovljena. S obzirom na ukupne vrijednosti Helkimova anamnestičkog indeksa ustanovljena je bila statistički značajna razlika između ispitanika s PTSP-om i onih iz kontrolne skupine, što je u skladu s rezultatima Uhača i suradnika.(5).

Helkimovim kliničkim disfunkcijskim indeksom određena je prevalencija znakova TMP-a kod skupine s PTSP-om i kod kontrolne skupine.

Neki znak TMP-a imalo je 82% ispitanika s PTSP-om i 44% onih iz kontrolne skupine. Svi ispitanici s PTSP-om klasificirani su u disfunkcijske indekse Di 0, I, II, a nitko nije bio raspoređen u disfunkcijski indeks Di III. Ti se rezultati vrlo malo razlikuju od rezultata Uhača i suradnika (5).

Kod obiju skupina ustanovljeno je da je blago smanjena pokretljivost mandibule bila najčešći znak TMP-a – javila se kod 63% ispitanika s PTSP-om i 28% onih iz kontrolne skupine. Ajanović (33) u svojem istraživanju zaključuje da je u početnoj fazi ograničena pokretljivost donje čeljusti jedan od najčešćih znakova temporomandibularnih disfunkcija. Ti se rezultati ne slažu s mišljenjem Lundena i njegovih suradnika (34) koji smatraju da su bolovi najčešći znakovi temporomandibularnih disfunkcija, ali su u skladu s rezultatima istraživanja Otuyemija i suradnika (35).

Za znakove TMP-a: smanjenu pokretljivost mandibule, smanjenu funkciju temporomandibularnih zglobova i bolove u mišićima, na temelju izračunavanja Hi-kvadrat testa ustanovljena je bila statistički znatna razlika između ispitivanih skupina, to jest između ispitanika s PTSP-om i onih iz kontrolne skupine. Za bolove kod pokreta mandibule i bolove u TMZ-u ta razlika nije ustanovljena.

Uhač i suradnici (5) nalaze među ispitivanim skupinama statistički značajnu razliku za sve navedene znakove temporomandibularnih disfunkcija.

Zaključak

Oboljeli od PTSP-a uspoređeni su sa zdravim ispitanicima i imali su mnogo više sljedećih simptoma TMP-a: zvuk u području temporomandibularnog zgloba, umor u području čeljusti i ukočenost; Velike su razlike između pacijenata s PTSP-om i

These symptoms were found at a statistically significant greater frequency in patients with PTSD in comparison with patients from the control group. This result corresponds with results found by Uhac et al (5) with regard to frequency of symptoms.

A difference between the two groups was found for the category value of the Ai II variable of the Helkimo anamnestic dysfunction index, while it was not found to be statistically significant for the variables Ai 0 and Ai I of the Helkimo anamnestic dysfunction index. In light of the total values of the Helkimo anamnestic dysfunction index, there is a statistically significant difference between the subjects with PTSD and the control group, which is again in compliance with results reported by Uhac et al. (5)

The Helkimo clinical dysfunction index found a prevalence of signs of TMD in both the group with PTSD and the control group.

82% of subjects with PTSD and 44% of the control group had one of the TMD signs.

All the subjects with PTSD were classified under dysfunction indexes Di 0, I, II, whereas one of the subjects was classified within dysfunction index Di III. These results are slightly different from those reported by Uhac et al. (5)

In both groups, mildly restricted mandibular movement was the most frequent sign of TMD, and was found in 63% of the subjects with PTSD and in 28% of the control group. According to Ajanovic M. (33) limited mobility of the mandible is one of the most frequent signs of TMD in its early stages. These results are not in compliance with the opinion expressed by Lunden et al (34), who stated that pain was the most frequent sign of temporomandibular dysfunction, though the results did correspond with the research results of Otuyemi et al. (35)

For the following signs of TMD - decreased movement of mandible, decreased TMJ function and muscle pain - calculation of the chi-square found a significant difference between the groups, whereas no difference was found for the following signs: painful movement of the mandible and TMJ pain.

Uhac et al (5) found a statistically significant difference between the groups tested in the case of all the signs of TMD cited above.

Conclusion

Patients with PTSD compared with healthy patients have a significantly greater number of the following symptoms of TMD: sound in the area of the temporomandibular joint, fatigue of the jaw and rigidity of the jaw.

zdravih ispitanika u ispitivanju u vezi s Helkimovim disfunkcijskim anamnestičkim indeksom; Pacijenti s PTSP-om uspoređeni sa zdravim ispitanicima imaju znatno više znakova TMP-a: smanjena im je pokretljivost mandibule i funkcija temporomandibularnih zglobova, a javljaju im se i bolovi u mišićima; Velike su razlike između oboljelih od PTSP-a i zdravih, kad je riječ o Helkimovu disfunkcijskom kliničkom indeksu.

There are significant differences between the PTSD and healthy patients in terms of Helkimo anamnestic dysfunction index.

Patients with PTSD compared with healthy patients have a significantly greater number of the following signs of TMD: decreased movement of mandible, decreased TMJ function and muscle pain

There are significant differences between the PTSD and healthy subjects in terms of Helkimo clinical dysfunction index.

Abstract

Objective: The aim of this study was to compare the prevalence of temporomandibular dysfunctions (TMD) symptoms/ signs in posttraumatic stress disorder (PTSD) group and non-PTSD matched control and to determine differences in values of Helkimo anamnestic dysfunction index (Ai) and Helkimo clinical dysfunction index (Di) between healthy and PTSD patients. **Material and methods:** The first group of subjects included 38 patients of both sexes aged 30 to 60 diagnosed with PTSD by their treating psychiatrists. The control group included 32 patients of both sexes, aged 30 to 60. All patients had their case histories taken in compliance with the Helkimo anamnestic dysfunction index and a corresponding clinical examination was performed in compliance with the Helkimo clinical dysfunction index. **Results:** Differences were established in relation to following symptoms of TMD: sound in the temporomandibular joint (TMJ) area, fatigue in the jaw area, rigidity of the jaw and in signs of TMD: decreased movement of mandible, decreased TMJ function and muscle pain. Calculation of the chi-square test for values of the Helkimo anamnestic and Helkimo clinical dysfunction index presented statistically significant differences between the two groups. **Conclusion:** The results of the study confirmed that PTSD affects the appearance of symptoms and signs of TMD. Therefore, it is necessary to bear it in mind in the treatment of patients suffering from PTSD as well as in patients suffering from TMD.

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References

1. Ash MM. Okklusion, Gestern und Heute. Okklusion, Dental Report-I. Stuttgart: Medica Verlang; 1996. p. 1-15.
2. Laskin DM. Etiology of the pain-dysfunction syndrome. J Am Dent Assoc. 1969;79(1):147-53.
3. Okeson PJ. Management of temporomandibular disorders and occlusion. St. Luis: Mosby; 1998. p. 152-70.
4. Helkimo M. Studies on function and dysfunction of the masticatory system. II. Index for anamnestic and clinical dysfunction and occlusal state. Sven Tandlak Tidskr. 1974;67(2):101-21.
5. Uhac I, Kovac Z, Valentić-Peruzović M, Juretić M, Moro LJ, Grzić R. The influence of war stress on the prevalence of signs and symptoms of temporomandibular disorders. J Oral Rehabil. 2003;30(2):211-7.
6. Rao SM, Glaros AG. Electromyographic correlates of experimentally induced stress in diurnal bruxists and normals. J Dent Res. 1979;58(9):1872-8.
7. Tsai CM, Chou SL, Gale EN, McCall WD Jr. Human masticatory muscle activity and jaw position under experimental stress. J Oral Rehabil. 2002;29(1):44-51.
8. Alamoudi N. Correlation between oral parafunction and temporomandibular disorders and emotional status among saudi children. J Clin Pediatr Dent. 2001;26(1):71-80.
9. List T, Wahlund K, Larsson B. Psychosocial functioning and dental factors in adolescents with temporomandibular disorders: a case-control study. J Orofac Pain. 2001;15(3):218-27.
10. Schiffman EL, Fricton JR, Haley D. The relationship of occlusion, parafunctional habits and recent life events to mandibular dysfunction in a non-patient population. J Oral Rehabil. 1992;19(3):201-23.
11. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. Washington DC: American Psychiatric Association; 1994.
12. van der Kolk BA, Greenberg MS, Orr SP, Pitman RK. Endogenous opioids, stress induced analgesia, and posttraumatic stress disorder. Psychopharmacol Bull. 1989;25(3):417-21.
13. Southwick SM, Bremner JD, Rasmusson A, Morgan CA 3rd, Arnsten A, Charney DS. Role of norepinephrine in the pathophysiology and treatment of posttraumatic stress disorder. Biol Psychiatry. 1999;46(9):1192-204.
14. Heim C, Ehlert U, Hellhammer DH. The potential role of hypocortisolism in the pathophysiology of stress-related bodily disorders. Psychoneuroendocrinology. 2000;25(1):1-35.
15. Carlson CR, Okeson JP, Falace DA, Nitz AJ, Curran SL, Anderson D. Comparison of psychologic and physiologic functioning between patients with masticatory muscle pain and matched controls. J Orofac Pain. 1993;7(1):15-22.
16. Grassi C, Passatore M. Action of the sympathetic system on skeletal muscle. Ital J Neurol Sci. 1988;9(1):23-8.
17. Passatore M, Grassi C, Filippi GM. Sympathetically-induced development of tension in jaw muscles: the possi-

ble contraction of intrafusal muscle fibres. Pflugers Arch. 1985;405(4):297-304.
18. Fricton JR, Schiffman EL. Reliability of a craniomandibular index. J Dent Res. 1986;65(11):1359-64.
19. Wänman A. Craniomandibular disorders in adolescents. A longitudinal study in an urban Swedish population. Swed Dent J Suppl. 1987;44:1-61.
20. Salonen L, Helldén L, Carlsson GE. Prevalence of signs and symptoms of dysfunction in the masticatory system: an epidemiologic study in an adult Swedish population. J Craniomandib Disord. 1990;4(4):241-50.
21. van der Weele LT, Dibbets JM. Helkimo's index: a scale or just a set of symptoms? J Oral Rehabil. 1987;14(3):229-37.
22. Levitt SR, Lundeen TF, McKinney MW. Initial studies of a new assessment method for temporomandibular joint disorders. J Prosthet Dent. 1988;59(4):490-5.
23. Pullinger AG, Monteiro AA. Functional impairment in TMJ patient and nonpatient groups according to a disability index and symptom profile. Cranio. 1988;6(2):156-64.
24. Carlsson GE, Egermark I, Magnusson T. Predictors of signs and symptoms of temporomandibular disorders: a 20-year follow-up study from childhood to adulthood. Acta Odontol Scand. 2002;60(3):180-5.
25. Mazengo MC, Kirveskari P. Prevalence of craniomandibular disorders in adults of Ilala District, Dar-es-Salaam, Tanzania. J Oral Rehabil. 1991;18(6):569-74.
26. Magnusson T, Egermarki I, Carlsson GE. A prospective investigation over two decades on signs and symptoms of temporomandibular disorders and associated variables. A final summary. Acta Odontol Scand. 2005;63(2):99-109.
27. Magnusson T, Egermark I, Carlsson GE. A longitudinal epidemiologic study of signs and symptoms of temporomandibular disorders from 15 to 35 years of age. J Orofac Pain. 2000;14(4):310-9.
28. Nourallah H, Johansson A. Prevalence of signs and symptoms of temporomandibular disorders in a young male Saudi population. J Oral Rehabil. 1995;22(5):343-7.
29. Okeson PJ. Management of temporomandibular disorders and occlusion. St. Luis: Mosby; 1998. p. 245-364.
30. Stanišić-Sinobad D. Zglobna veza mandibule sa kranijumom-normalna funkcija i poremećaji. Belgrade: University of Belgrade; 2001.
31. Bumann A, Lotzmann U. TMJ Disorders and orofacial pain. The role of dentistry in a multidiscoplinary diagnostic approach. Stuttgart, New York: Thieme; 2002.
32. Weinberger M, Tierney WM, Booher P, Hiner SL. Social support, stress and functional status in patients with osteoarthritis. Soc Sci Med. 1990;30(4):503-8.
33. Ajanovic M. Relationship between occlusal interferences, symptoms and signs of temporomandibular dysfunction [dissertation]. Sarajevo: University of Sarajevo; 2008.
34. Lundeen TF, Levitt SR, McKinney MW. Evaluation of temporomandibular joint disorders by clinician ratings. J Prosthet Dent. 1988;59(2):202-11.
35. Otuyemi OD, Owotade FJ, Ugboko VI, Ndukwe KC, Olusile OA. Prevalence of signs and symptoms of temporomandibular disorders in young Nigerian adults. J Orthod. 2000;27(1):61-5.