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# PREVALENCIJA LEZIJA ORALNE MUKOZE KOD INSTITUCIONALIZOVANIH STARIJIH OSOBA

## PREVALENCE OF ORAL MUCOSAL LESIONS AMONG THE INSTITUTIONALIZED ELDERLY PEOPLE

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### Sažetak

**Uvod:** Prisustvo mukoznih promena i varijacija prilično je rasprostranjeno među odraslim osobama u ustanovama.

**Cilj:** Cilj ovog rada bio je da se utvrdi prevalencija promena na oralnoj sluzokoži kod starijih lica smeštenih u ustanove za odrasle osobe.

**Materijal i metode:** Predstavljani podaci dobijeni su istraživanjem koje je sprovedeno u periodu od maja do jula 2018. godine u staračkom domu „Majka Tereza“ u Skoplju, u Republici Severnoj Makedoniji. Istraživanje je obuhvatilo ukupno 70 ispitanika starijih od 65 godina i bilo je usmereno na prisustvo promena na sluzokoži. Prilikom opisa promena na oralnoj sluzokoži koristili smo dva različita pojma – lezija ili patološka promena i varijacija normalne sluzokože.

**Rezultati:** Ispitivanjem prevalencije lezija oralne sluzokože utvrđeno je da svi ispitanici imaju bar jednu oralnu promenu u usnoj duplji. Prosečan broj oralnih promena kod ispitanika starijih osoba u ustanovama bio je  $2,24 \pm 0,69$ . Na oralnoj sluzokoži 70 ispitanika dijagnostikovane su ukupno 157 promene. U grupi normalnih varijacija sluzokože dominirali su Status Fordyce (35,71%) i obloženi jezik (28,57%). U grupi patoloških promena prevladavale su lezije povezane sa nošenjem protetičkih sredstava, tj. ulcerozne promene izazvane protetikom (15,71%) i stomatitis protetica (10%).

**Zaključak:** U ispitanjima potvrđeno je stopostotno prisustvo oralnih promena. Većinu su činile varijacije oralne sluzokože. Međutim, važnije patološke lezije bile su one povezane sa nošenjem protetičkih aparata. Takođe, veoma je važno istaći da patološke lezije zahtevaju stalno praćenje.

**Ključne reči:** institucionalizovane starije osobe, oralne lezije, gerontostomatologija, oralne promene

### Abstract

**Background:** The presence of mucosal changes and variations is quite high among institutionalized adults.

**Aim:** The present study aimed to determine the prevalence of oral mucosal changes among the institutionalized elderly.

**Material and method:** The presented data originate from research done in the period from May–July 2018 in “Mother Teresa” nursing home in Skopje, Republic of North Macedonia. The investigation included a total number of 70 subjects older than 65 years and it was focused on the presence of mucosal changes. In describing the changes in oral mucosa we have used two differentiated terms—lesion or pathological change and variation from normal.

**Results:** During the examination of the prevalence of oral mucosal lesions we have found that all the subjects have at least one oral change in their oral cavity. The average number of oral changes among the examined institutionalized elderly is  $2,24 \pm 0,69$ . Total number of diagnosed changes on oral mucosa among all 70 subjects was 157. In the group of normal mucosa, variations dominate status fordyce (35.71 %) and coated tongue (28,57%). In the group of pathological changes, there is a domination of the lesions associated with the wearing of prosthetic devices—ulcerous changes caused by the prosthetic devices (15.71%) and stomatitis protetica (10%).

**Conclusion:** In the investigated population, there is a one hundred percent presence of oral changes. Most of them are variations of the oral mucosa. But more important pathological lesions are those associated with wearing prosthetic devices. Also, it is very important to stress that pathological lesions require constant monitoring.

**Key words:** institutionalized elderly, oral lesions, gerontological dentistry, oral changes

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## Uvod

Starenje je biološki proces koji ima svoju dinamiku i svoje karakteristike. Ovaj proces je progresivan i nepovratan i odgovoran za modifikaciju strukture i funkcije svih tkiva, uključujući i oralna tkiva.

Poodmaklo doba donosi ozbiljne probleme sa zubima. Hronične bolesti organizma i najčešće oralne bolesti imaju zajedničke faktore rizika. Ovu činjenicu treba imati na umu prvenstveno zbog njihove povezanosti, ali i zbog toga što većina starijih ljudi ima zdravstvene probleme koji mogu uticati na oralno zdravlje.

U pogledu kvaliteta života, oralno zdravlje uslovljavaju mnogi faktori: karijes i njegove komplikacije, koreni zuba koji nisu lečeni i izvađeni, bolesti oralne sluzokože i brojne oralne infekcije, prekancerozna stanja i benigni i maligni tumori, bol u temporo-mandibularnom zglobu, kserostomija i, naravno, totalna ili parcijalna anodoncija<sup>1</sup>.

U savremenoj stomatologiji postoji sve veća potreba za rešavanjem svih problema vezanih za oralno zdravlje i higijenu kod starijih. Treba istaći da su razne promene i promene mekih i tvrdih tkiva usne šupljine povezane sa različitim uticajima na oralnu šupljinu, ali i na opšte zdravlje ovih pojedinaca.

Sa starenjem nastaju neizbežne promene u celom organizmu, tako da ni usna duplja ni status zuba nisu pošteđeni.

Prisustvo lezija na sluzokoži kod institucionalizovanih odraslih osoba prilično je rasprostranjeno; najčešće su prisutne lezije oralne sluzokože izazvane nošenjem proteza – protetički stomatitis (*stomatitis protetica*) i protetička hiperplazija. Najčešće promene oralne sluzokože koje nisu povezane sa nošenjem proteza predstavljaju sublingvalne varikoze i prisustvo obloženog jezika<sup>2</sup>.

Angularni heilitis (*cheilitis angularis*) koji se razvija kod starijih ljudi ima mešovitu etiologiju i može biti posledica neodgovarajućih međuokluzalnih odnosa ili smanjene sekretorne funkcije pljuvačnih žlezda. Može se manifestovati jednostrano ili bilateralno i najtipičnija je promena kod starijih osoba sa protezama. Starije osobe sa angularnim heilitisom imaju bolove koji se pojačavaju u toku jela, a posebno prilikom skidanja i postavljanja zubnih proteza<sup>3</sup>.

Mujica et al.<sup>4</sup> naveli su da je 57% ispitanika imalo jednu ili više oralnih lezija povezanih sa nošenjem zubnih proteza, traumom, odnosno uzrokovanih upotrebom duvana.

## Introduction

Ageing is a biological process which has its dynamics and characteristics. This process is progressive and irreversible, and it is responsible for modifying the structure and function of all tissues, including oral tissues.

The advanced age brings serious dental problems. Chronic diseases of the organism and the most common oral diseases present common risk factors. This fact is necessary to know primarily because of their relationship, but also because most elderly people have some health problems that may impact oral health.

Oral health in the context of quality of life is conditioned by many factors such as dental caries and its complications, untreated and non-extracted dental roots, diseases of the oral mucosa and numerous oral infections, precancerous conditions and benign and malignant tumours, pain in the temporomandibular joint, xerostomia and of course the total or partial anodontia<sup>1</sup>.

In modern dentistry, there is an increased need to solve all problems associated with oral health and hygiene in the elderly, where various changes and alterations of oral soft and hard tissues are associated with different effects on oral, as well as on the general health of these individuals.

With increasing age, unavoidable changes involve the entire organism, and the oral cavity and dental status are not spared from these changes.

The presence of mucosal lesions among institutionalized adults is quite high and the most frequent lesions of the oral mucosa are those induced by wearing dentures—prosthetic stomatitis (*stomatitis protetica*) and prosthetic hyperplasia. The most common changes in the oral mucosa that are not associated with wearing dentures are sublingual varices and the presence of a coated tongue<sup>2</sup>.

Angular cheilitis (*cheilitis angularis*) that develops in older people has mixed etiology and may be caused by inappropriate inter-occlusal relations or the reduced secretory function of salivary glands. It can be manifested unilaterally or bilaterally, and it is the most typical change in older persons with prostheses. Older people with angular cheilitis have pain that is aggravated by eating and especially the manipulation of removal and placement of dental prostheses<sup>3</sup>.

According to Mujica et al.,<sup>4</sup> 57% of subjects possessed one or more oral lesions associated with the wearing of dental prostheses, trauma or caused by the use of tobacco.

Lezije kod osoba starosti od 60 godina do 74 godine bile su značajno češće kod osoba u ustanovama; pojedini su imali više od četiri oralne lezije. Najčešće zabeležene lezije u ovom istraživanju bile su protetički stomatitis (*stomatitis protetica*), oralna leukoplakija, prisustvo hemangioma, oralne melanotične makule, traumatski fibrom, inflamatorna fibrozna hiperplazija i angularni heilitis (*cheilitis angularis*).

Prema Nevalainenu et al.<sup>5</sup>, kod 51% ispitanika sa bimaxilarnom anodoncijom i prisutnim totalnim protezama primećene su oralne promene, dok su kod 31% onih koji imaju mobilne proteze i malo prirodnih zuba uočene promene na sluzokoži. U ovoj studiji, tri najčešće lezije povezane sa nošenjem mobilnih proteza bile su promene u pokrivenosti jezika (atrofični glositis), angularni heilitis (*cheilitis angularis*) i sublingvalne varikoze. Mada je većina lezija benigne prirode, one imaju potencijal da postanu maligne, posebno ako postoje lokalni ili sistemski predisponirajući faktori.

Orofaringealna kandidijaza najčešća je oportuna infekcija usne duplje kod starijih osoba, a uzrokovana je prekomernim rastom gljivica iz *Candida* spp. Najčešće kliničke manifestacije ove bolesti jesu protetički stomatitis, atrofični glositis i akutni angularni heilitis. Prevalencija ove bolesti kod starijih osoba u ustanovama iznosila je između 13% i 47%. Faktori predispozicije za kandidijazu mogu biti lokalni i sistemski. Lokalni faktori uključuju kontinuirano nošenje proteze, smanjeno lučenje pljuvačke i lošu oralnu higijenu<sup>6</sup>. U grupu sistemskih faktora spadaju prekomerna upotreba antibiotika i drugih lekova, neuhranjenost, dijabetes, imunosupresija i maligniteti. Laurent et al.<sup>7</sup> preporučuju svakodnevno pranje i dezinfekciju proteza i njihovo skidanje noću, naročito kod starijih osoba sa protezama smeštenih u ustanove.

*Candida* spp. imaju sposobnost da se ugrade u akrilatnu komponentu i ćelije epitela usne šupljine. Prema Ivanovskom et al.<sup>8</sup>, ova njihova odlika očigledna je kada se povećava unos ugljenih hidrata i u slučajevima neadekvatne oralne higijene. Kada se uzmu u obzir ova dva lokalna predisponirajuća faktora (smanjene lokalne odbrambene sposobnosti organizma i smanjeno lučenje pljuvačke), što je slučaj kod starijih osoba, mogućnost infekcije kandidijazom mnogo je veća.

Kod starijih ljudi, uprkos povećanom riziku od hroničnih oboljenja u usnoj duplji, uključujući zubne infekcije (kao što su karijes i hronični parodontitis), uprkos velikom broju

Lesions in people aged 60 to 74 years were significantly more common in institutionalized people, and some of them had more than 4 different oral lesions. The most frequently observed lesions according to this research were prosthetic stomatitis (*stomatitis protetica*), oral leukoplakia (*leucoplakia*), the presence of hemangioma, oral melanotic macula, traumatic fibroma, inflammatory fibrous hyperplasia and angular cheilitis (*cheilitis angularis*).

According to Nevalainen et al.,<sup>5</sup> in 51% of the subjects with bimaxillary anodontia and present total dentures, oral changes were noticed, while in 31% of those who own mobile prostheses and few natural teeth, mucosal changes were observed. In this study, the three most common lesions associated with wearing mobile dentures were changes in tongue coverage (atrophic glossitis), angular cheilitis (*cheilitis angularis*) and sublingual varices. Most of the lesions are benign in nature, but they have the potential to become malignant, especially if there are local or systemic predisposing factors.

Oropharyngeal candidiasis is the most common opportune infection of the oral cavity in the elderly. It is caused by excessive growth of the fungi from *Candida* spp. The most common clinical presentations of this disease are prosthetic stomatitis, atrophic glossitis and acute angular cheilitis. The prevalence of this disease in the institutionalized elderly is from 13% to 47%. Predisposing factors for candidiasis can be local and systemic. Local factors include continuous prosthesis wearing, reduced salivary secretion and poor oral hygiene<sup>6</sup>. The group of systemic factors includes overuse of antibiotics and other drugs, malnutrition, diabetes, immunosuppression and malignancies. Recommendation by Laurent et al.<sup>7</sup> is daily washing and disinfecting dentures and extracting them at night, especially among institutionalized elderly people with prostheses.

*Candida* spp. can incorporate in the acrylate component and the oral epithelial cells. According to Ivanovski et al.<sup>8</sup> this feature is apparent when intake of carbohydrates is increased and in cases with inadequate oral hygiene. When these two local predisposing factors are noticed—reduced local defence capabilities of the body and reduced secretion of saliva, as is the case in the elderly, the potential for candidiasis infection is much greater.

Older people despite having an increased risk of chronic diseases in the oral cavity,

izvađenih zuba, postoji povećana učestalost benignih lezija sluzokože i raka usne šupljine. Laurent et al.<sup>7</sup> su potvrdili da su najčešće oralne bolesti u starijoj populaciji kserostomija i oralna kandidijaza, obično klinički predstavljene kao pseudomembranozna kandidijaza i eritematozne lezije predstavljene kao protetički stomatitis ili angularni heilitis.

Starenje je kod pojedinih osoba povezano sa smanjenom osetljivosti na ukus. Gubitak čula ukusa ne samo da ukazuje na promenu u kvalitetu života nego dovodi i do gubitka telesne težine i drugih ozbiljnih zdravstvenih problema u institucionalizovanoj odrasloj populaciji.<sup>9</sup>

S obzirom na prethodno navedene činjenice o oralnom zdravlju, prisustvo brojnih oralnih tegoba, povećane potrebe i loše oralno zdravlje starijih u ustanovama, cilj ovog rada bio je da se utvrdi prevalencija promena na oralnoj sluzokoži kod institucionalizovanih starijih osoba.

### ***Materijali i metode***

Podaci koji se predstavljaju dobijeni su na osnovu pregleda koji su obavljani u periodu od maja do jula 2018. godine na odeljenju „Majka Tereza“ Gerontološkog instituta „13. novembar“ u Skoplju, u Republici Severnoj Makedoniji.

Istraživanjem je bilo obuhvaćeno ukupno 70 ispitanika starijih od 65 godina. Većinu u ovim ustanovama čine funkcionalno zavisne osobe, a dominiraju hronične bolesti. Ovaj multimorbiditet dovodi do ozbiljnog invaliditeta ili do zavisnosti od pomoći drugih. S druge strane, većini ovih ljudi potrebna je dugotrajna nega.

Sa ciljem objektivne procene stanja oralnog zdravlja kod institucionalizovanih starijih lica, urađen je oralni pregled koji je podrazumevao utvrđivanje prisustva promena na oralnoj sluzokoži. Ispitivanje se odnosilo na prisustvo mukoznih promena i njihovu povezanost sa postojećim protetičkim aparatima.

Prilikom opisa promena na oralnoj sluzokoži koristili smo dva različita pojma:

- lezija ili patološka promena;
- varijacija normalnog.

Ako je promena uzrokovana specifičnim i određenim patološkim procesom specifične etiologije, ako je potrebno lečenje i ako se ne leči i ima lošu prognozu, lezija se označava kao oralna lezija. Promene bez kliničkih pojava koje ne zahtevaju lečenje svrstavaju se u grupu varijacija normalne oralne sluzokože.

including dental infections (such as caries and chronic periodontitis), and a high number of extracted teeth, have an increased incidence of benign mucosal lesions and oral cancer. Laurent et al.<sup>7</sup> confirmed that the most common oral diseases among the elderly are xerostomia and oral candidiasis, commonly clinically presented as pseudo-membranous candidiasis, erythematous lesions presented as prosthetic stomatitis or angular cheilitis.

Ageing in some older individuals is associated with reduced sensitivity to taste. The loss of sense of taste indicates not only on the changes the quality of life, but also leads to loss of weight and other serious health problems in the institutionalized adult population.<sup>9</sup>

Taking into consideration previously mentioned facts about oral health, the presence of numerous oral problems and increased needs and poor oral health among the institutionalized elderly, the aim of this paper was established—to determine the prevalence of oral mucosal changes among the institutionalized elderly.

### ***Material and method***

The presented data originate from research done in the period from May to July 2018 in the department “Mother Teresa”, within the Gerontology Institute “13<sup>th</sup> November” Skopje, Republic of North Macedonia.

The investigation included a total number of 70 subjects older than 65 years. In these institutions, most institutionalized persons are functionally dependent individuals, and chronic diseases are dominant. This multimorbidity leads to serious disability or dependence on foreign assistance, and on the other hand, most of these people need long-term care.

To make an objective assessment of the situation of oral health in the institutionalized elderly, adequate clinical examination was performed—an oral examination that included a determination of the presence of oral-mucosal changes. The survey refers to the presence of mucosal changes, and their linkages with existing prosthetic devices.

In describing the changes in oral mucosa, we have used two differentiated terms-

- lesion or pathological change, and
- variation of normal.

If a change is caused by a specific and definite pathologic process with a specific etiology, requires treatment, and has a poor prognosis if left untreated, the lesion is

Promene na oralnoj sluzokoži takođe su podeljene na osnovu njihovog odnosa prema nošenju protetičkih sredstava. Lezije se mogu smatrati povezanim sa nošenjem proteza samo ako su lokalizovane na oralnoj sluzokoži ispod baze proteze i ako ne postoji drugo objašnjenje za njihov poseban izgled ispod baze proteze.

Dijagnoza oralnosluzokožne promene zasnivala se samo na vizuelnom pregledu ili na parakliničkim testovima. Biopsija nije bila korišćena kao dijagnostička procedura.

Podaci dobijeni na osnovu anamneze i kliničkog pregleda bili su prikupljeni i statistički obrađeni u skladu sa tim.

Za statističku obradu koristili smo poseban softver za statističku obradu podataka – Statistica 7.1.

Rezultati su predstavljeni u tabelama i grafikonima.

## Rezultati

Prilikom ispitivanja rasprostranjenosti lezija oralne sluzokože i drugih stanja, utvrdili smo da svi ispitanici imaju bar jednu oralnu promenu u usnoj duplji. Kod približno polovine ispitanika uočeno je prisustvo dveju promena na oralnoj sluzokoži (47.14 % ispitanika). Prosečan broj oralnih promena kod ispitanih starijih osoba u ustanovama bio je  $2,24 \pm 0,69$ .

Na oralnoj sluzokoži 70 ispitanika dijagnostikovane su ukupno 157 promene.

Oralne promene su podeljene u dve velike grupe: varijacije oralne sluzokože i patološke promene oralne sluzokože. Kod starijih osoba u ustanovama preovladavale su varijacije normalne sluzokože (Slika 1).

classified as an oral lesion. Changes without clinical expression that do not require treatment are classified as variations from normal oral mucosa.

Changes in the oral mucosa are also divided according to their relation to the wearing prosthetic devices. They are considered to be related to denture wearing only if they are localized in the oral mucosa under prosthetic base and if there is no other explanation for their particular appearance under the denture base.

The diagnosis of oral-mucosal change is based only on visual inspection or paraclinical diagnostic tests, but biopsy as a diagnostic procedure was not used.

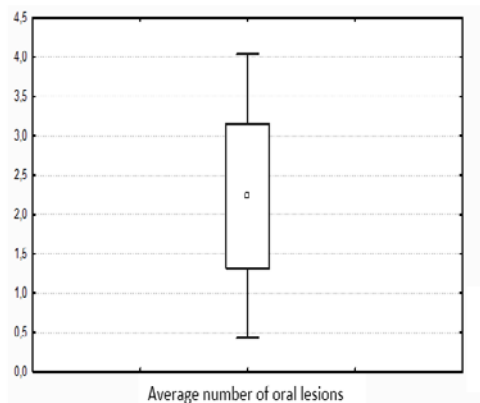
The data obtained from the history and clinical examination were statistically processed using special software Statistica 7.1 for statistical data processing. Results are presented using tables and figures.

## Results

During the research on the prevalence of oral mucosal lesions and other conditions, it was found that all the subjects had at least one oral change in their oral cavity. In approximately half of the subjects, the presence of two changes in the oral mucosa (47.14% of the subjects) was observed. The average number of oral changes among the examined institutionalized elderly was  $2,24 \pm 0,69$ .

Total number of diagnosed changes in oral mucosa among all 70 subjects was 157.

Oral changes were divided into two major groups: variations of the oral mucosa and pathological changes of the oral mucosa. In the institutionalized elderly more prevalent were variations of the normal mucosa (Figure 1).



**Slika 1.** Prosečan broj lezija oralne mukoze kod starijih osoba  
**Figure 1.** Average number of oral-mucosal lesions in the elderly

Najčešće su bile prisutne promene povezane sa dugotrajnom upotrebom proteza ili protetičkih sredstava neodgovarajućih dimenzija (67.50% ispitanika koji nose proteze žali se na izvesne poteškoće prilikom nošenja). Najmanje je bilo potvrda aftoznih promena i hemangioma (5.71% i 2.86%, redom).

Kod ispitanih starijih osoba zabeleženo je više od dvadeset različitih promena oralne sluzokože. Najčešće oralne promene bile su: *Status Fordyce* (35.71%), obložen jezik (28.57%), sublingvalne varikoze (20.00%), *lingua plicata* (20.00%), angularni heilitis (17.14%), pigmentacija oralne sluzokože (17.14%), atrofične promene jezičnog obuhvata (12.86%), dekubitalne ulcerozne promene oralne sluzokože (15.71%), protetička ili traumatska hiperplazija (8.57%) i *stomatitis protetica* (10.00%) (Tabela 1).

U grupi normalnih varijacija sluzokože dominirali su *Status Fordyce* (35.71%) i obloženi jezik (28.57%).

U grupi patoloških promena preovladavale su lezije povezane sa nošenjem protetičkih sredstava – dekubitalno-ulcerozne promene izazvane nošenjem protetičkih sredstava (15.71%) i *stomatitis protetica* (10%). Od preostalih pomenutih promena najčešće su bile atrofična jezična pokrivenost (12.86%) i aftozna promena (5.71%).

Kod jednog (1.43%) ispitanika konstatovano je prisustvo pareze n. *facialis*. Osim pareze, kod ovog pacijenta otkriveni su *Status Fordyce*, obloženi jezik i angularni heilitis.

Most commonly present changes associated with long-term use of prostheses or inadequately dimensioned prosthetic devices (67.50% of subjects who wore prostheses complained of some difficulty wearing them), while having aphthous changes and haemangiomas (5.71% and 2.86%, respectively).

More than twenty different changes of the oral mucosa were found among the surveyed elderly. Most common oral change were: *Status fordyce* (35.71%), coated tongue (28.57%), sublingual varices (20.00%), *lingua plicata* (17.14%), angular cheilitis (20.00%), pigmentation of the oral mucosa (17.14%), atrophic changes of tongue coverage (12.86%), and decubital ulcerous changes of oral mucosa (15.71%), prosthetic or traumatic hyperplasia (8.57%) and *stomatitis protetica* (10.00%) (Table 1).

In the group of normal mucosa variations dominated *status fordyce* (35.71%) and coated tongue (28.57%).

In the group of pathological changes dominated the lesions associated with wearing prosthetic devices—decubital-ulcerous changes caused by the wearing of prosthetic devices (15.71%) and *stomatitis protetica* (10%), while from the remaining changes most frequent were atrophy of tongue coverage (12.86%) and aphthous change (5.71%).

In one (1.43%) of the subjects, the presence of paresis of n. *facialis* was noted. Apart from paresis, *status fordyce*, coated tongue and angular cheilitis were detected in this patient as well.

**Tabela 1.** Prevalencija promena oralne mukoze kod starijih osoba smeštenih u institucijama

**Table 1.** Prevalence of oral mucosal alterations among the institutionalized elderly

Oral mucosa alterations	No.	Percentage of examined population	Percentage of the total number of lesions
<b>Lesions</b>			
➤ Angular cheilitis	12	17.14 %	7.64 %
➤ Decubital ulcers	11	15.71 %	7.01 %
➤ Atrophic glossitis	9	12.86 %	5.73 %
➤ Traumatic hyperkeratosis	8	11.43 %	5.09 %
➤ Stomatitis protetica	7	10.00%	4.46 %
➤ Prosthetic hyperplasia	6	8.57 %	3.82 %

➤ <i>Apthous changes</i>	4	5.71 %	2.55 %
➤ <i>Herpes labialis</i>	2	2.86 %	1.27 %
➤ <i>Hemangioma</i>	2	2.86 %	1.27 %
➤ <i>Lichen planus</i>	1	1.43 %	0.64 %
Total	62		
<b>Variations</b>			
➤ <i>Status Fordyce</i>	25	35.71%	15.92 %
➤ <i>Coated tongue</i>	20	28.57 %	12.74 %
➤ <i>Sublingual varices</i>	14	20.00%	8.92 %
➤ <i>Lingua plicata</i>	14	20.00 %	8.92 %
➤ <i>Oral pigmentations</i>	12	17.14 %	7.64 %
➤ <i>Torus palatinus</i>	4	5.71 %	2.55 %
➤ <i>Hyperplasia gll. labiorum</i>	4	5.71 %	2.55 %
➤ <i>Lingua geographica</i>	3	4.29 %	1.91 %
➤ <i>Short lingual frenulum</i>	1	1.43 %	0.64 %
Total	95		100.00 %

## Diskusija

Podaci o prisustvu oralnih promena kod starijih osoba u ustanovama do kojih se došlo u ovom istraživanju ukazuju na to da je stanje lošije od onog posvedočenog u brojnim studijama koje su se sprovodile u visokorazvijenim zemljama.

Stopostotno prisustvo oralnih promena među starijim osobama u ustanovama obuhvaćenim našom studijom veće je od prevalencije koju su prikazali Kal Dunder i Turska (40,7%)<sup>10</sup>, Rabiei et al. (86,1%)<sup>11</sup> i Ekelund (60%)<sup>12</sup>. Ipak, treba pomenuti da poređenje podataka dobijenih u ovoj studiji sa podacima iz drugih epidemioloških studija nije adekvatno, kako zbog varijacija u metodologiji i klasifikaciji promena, tako i zbog razlika u dijagnostičkim kriterijumima. Smatra se da je ovako visoka učestalost oralnih promena posledica činjenice da se ne pravi razlika između striktno patoloških i nepatoloških lezija.

## Discussion

The presence of oral changes in the institutionalized elderly found in this research is worse in comparison with the data presented in numerous studies in highly developed countries.

A one hundred percent presence of oral changes among the institutionalized elderly in this study is higher than the prevalence presented by Kal Dunder and Turkey<sup>10</sup> (40.7%), Rabiei et al.<sup>11</sup> (86.1%) and Ekelund<sup>12</sup> (60%). A comparison of the data obtained in this study and from other epidemiological studies is inadequate primarily because of the variations in methodology and classification changes as well as differences in diagnostic criteria. This high incidence of oral changes are thought to be due to the fact that no distinction is made on strictly pathological and non-pathological lesions.

Na primer, prisustvo oralnih lezija kod starijih osoba u ustanovama u Danskoj iznosilo je 45% zato što su se procenjivale samo lezije lokalizovane na jeziku<sup>13</sup>.

Minimalna prevalencija od 18,3% oralnih lezija koju su naveli Saintrain et al.<sup>14</sup> pokazuje koliko je značajan uticaj metodologije i različitih kliničkih dijagnostičkih kriterijuma za procenu njihove prevalencije.

Više od polovine naših ispitanika, tačnije 60.51% njih (Tabela 1), imalo je promene sluzokože koje su registrovane kao varijacije normalne oralne sluzokože; one su benigne i ne zahtevaju poseban tretman. Ovaj rezultat se u potpunosti poklapa sa onim do kojeg su došli Ferreira et al.<sup>2</sup>. Šmatra se da su promene uglavnom posledica procesa adaptiranja oralnog tkiva na dejstvo mehaničkih, hemijskih ili termičkih faktora. U manjem broju slučajeva, lezije su uzrokovane sistemskim oboljenjima ili imaju premaligni karakter<sup>15</sup>.

Prema našem mišljenju, visoka zastupljenost obloženog jezika od 28.57% (Tabela 1) u ispitivanoj populaciji rezultat je neadekvatne oralne higijene ispitanika, njihove nepravilne ishrane, a može biti i nuspojava korišćenih lekova. Ova varijacija usne duplje izdvaja se kao najčešća među starijim osobama smeštenim u ustanove u brojnim radovima<sup>16-18</sup>. Slične rezultate predstavili su i Ferreira et al.<sup>2</sup> i Smith et al.<sup>19</sup>. Rezultati do kojih su došli Avcu et al.<sup>20</sup>, Samaranaiake et al.<sup>18</sup> i Campisi i Margiota<sup>21</sup> ukazali su na prisustvo obloženog jezika kod više od polovine ispitanika. Solemdal et al.<sup>22</sup> i Lavahez et al.<sup>23</sup> pomenuli su ređe prisustvo obloženog jezika kod starijih osoba smeštenih u ustanove (ispod 10%).

Kada je posredi *Status Fordyce*, rezultati do kojih se došlo u ovoj studiji (35.71%) (Tabela 1) slični su onima koje su dobili Ferreira et al.<sup>2</sup>; Olivier<sup>24</sup> pak prikazuje skoro dvostruku prevalenciju – 52,7%.

Prisustvo *lingua plicata* varira u različitim studijama i ispitivanjima. Podaci koje su izneli Jankittivong et al.<sup>25,26</sup> i Rabei et al.<sup>11</sup> slični su podacima o prisustvu *lingua plicata* iz ovog istraživanja – 20% (Tabela 1). Mozafari et al.<sup>27</sup> primetili su veću prevalenciju *lingua plicata* (66,5%) nego Triantos<sup>28</sup>, Lavahez et al.<sup>23</sup> i Mallo et al.<sup>29</sup>, koji su naveli nižu prevalenciju varijacija sluzokože.

Sublingvalne varikoze su veoma česte varijacije sluzokože kod starijih osoba<sup>25,30-32</sup>. U različitim studijama predstavljen je širok spektar podataka. Rabei et al.<sup>11</sup> dali su prezentaciju sublingvalnih varikoziteta sličnu onoj iz ovog istraživanja: 20.00% (Tabela 1).

For example, the presence of oral lesions in 45% of the institutionalized elderly in Denmark is because only mucosal lesions localized on the tongue were evaluated<sup>13</sup>.

Minimal prevalence of 18,3% of oral lesions detected by Saintrain et al.<sup>14</sup> indicates a significant impact of the methodology and the different clinical diagnostic criteria for the evaluation of their prevalence.

More than half, precisely 60.51% of the subjects possess mucosal alterations registered as variations of normal oral mucosa, which are benign and do not require special treatment (Table 1). This finding fully coincides with that of Ferreira et al.<sup>2</sup> It is thought that the changes are mainly due to adaptive processes of the oral tissues to the action of mechanical, chemical or thermal factors, while fewer lesions are caused by systemic diseases or have premalignant character<sup>15</sup>.

The high presence of 28.57% of coated tongue in the examined population is believed to be the result of inadequate oral hygiene among subjects, improper diet or may be a side effect of used medications (Table 1). In numerous studies, this variation of the oral cavity is considered as most common among the institutionalized elderly<sup>16-18</sup>. Similar results in their articles were published by Ferreira et al.<sup>2</sup> and Smith et al.<sup>19</sup> Findings presented by Avcu et al.<sup>20</sup>, Samaranaiake et al.<sup>18</sup> and Campisi and Margiota<sup>21</sup> indicate the presence of coated tongue in more than half of the subjects. Solemdal et al.<sup>22</sup> and Lavahez et al.<sup>23</sup> presented a smaller presence of coated tongue among the institutionalized elderly (below 10%).

The presence of 35.71% of *Status Fordyce* shown in this study (Table 1) is similar to the prevalence found by Ferreira et al.<sup>2</sup> while Olivier<sup>24</sup> suggests almost double prevalence—52.7%.

The presence of *lingua plicata* varies in different studies. The data presented by Jankittivong et al.<sup>25,26</sup> and Rabei et al.<sup>11</sup> are similar to the data relating to the presence of *lingua plicata* discovered in this research—20% (Table 1). Mozafari et al.<sup>27</sup> noted a higher prevalence of *lingua plicata* (66.5%), versus Triantos<sup>28</sup>, Lavahez et al.<sup>23</sup> and Mallo et al.<sup>29</sup> who presented a lower prevalence of this mucosal variation.

Sublingual varices are very common mucosal variations in the elderly<sup>25,30-32</sup>. Rabei et al.<sup>11</sup> presented a similar representation of sublingual varices as in this study—20.00% (Table 1) vs. Mozafari et al.<sup>27</sup> and Ferreira et al.<sup>2</sup> who presented prevalence of this alteration more than 50%.



S druge strane, Mozafari et al.<sup>27</sup> i Ferreira et al.<sup>2</sup> ukazali su na to da prevalencija ove promene iznosi više od 50%. Yeatts i Burns<sup>33</sup> i Jankittivong et al.<sup>25</sup> pomenuli su prevalenciju sublingvalnih varikoziteta manju od 5%.

*Torus palatinus* je egzostoza koja može biti različito izražena, sa različitim oblicima i konfiguracijom<sup>34</sup>. U ovom istraživanju je kod 5.71 % (Tabela 1) ispitanika registrovana egzostosa – *torus palatinus*. Na sličnu prevalenciju ovih egzostoza ukazali su Kurniawan et al.<sup>35</sup>. Rezultati do kojih su došli Mumcu et al.<sup>36</sup> pokazali su da je prevalencija *torus palatinus* manja od jednog procenta (0,5%). Nasuprot ovim studijama, istraživanja mnogih drugih autora predočila su značajno veću prevalenciju navedenih egzostoza<sup>33,37-39</sup>.

*Lingua geographica* se klinički manifestuje sa atrofičnim jako eritematoznim delovima dorzalne površine jezika sa nepravilnim ivicama. Prevalencija ove varijacije oralne sluzokože od 4.29% (Tabela 1) među našim ispitanicima slična je prevalenciji koju su naveli Mansoir-Chanaei et al.<sup>40</sup> i Robledo-Sierra et al.<sup>41</sup>, a razlikuje se od one koju su pomenuli Iarom et al.<sup>42</sup> – prevalencija ove promene sluzokože u toj studiji bila je veća. Da je učestalost ove varijacije sluzokože niska pokazala su i istraživanja koja su sprovedli Ferreira et al.<sup>2</sup>, Mozafari et al.<sup>27</sup> i Shulman i Carpenter<sup>43</sup>. Shulman i Carpenter<sup>43</sup> i Taivo et al.<sup>44</sup> su u svojim studijama istakli snažnu povezanost benignog migratornog glositisa i *lingua plicata*.

Lingvalni frenulum kao jaka fibrozna traka koja povezuje jezik sa podom usne duplje kod anodontskih pacijenata može uticati na adekvatnu stabilnost donje proteze. Rezultati koji se tiču prisustva nepravilno postavljenog frenuluma u našem istraživanju iznosili su 1,43% (Tabela 1); to se poklapa sa nalazima Lalakea i Messnera<sup>45</sup> i Mujice et al.<sup>4</sup>. Kueiroz Marchesan<sup>46</sup> pomenio je veću prevalenciju nepravilno postavljenog jezičnog frenuluma (od 9%) kod starijih osoba.

Protetički stomatitis i protetička hiperplazija najčešće su lezije oralne sluzokože koje su povezane sa nošenjem protetičkih sredstava. Hiperplazija proteze bila je prisutna kod 10% naših ispitanika (Tabela 1). Rezultati ovog istraživanja slični su nalazima Mozafarija et al.<sup>27</sup> i Mujice et al.<sup>4</sup>.

Pojedini autori smatraju da se stariji navikavaju na protezu koja je preopterećena. Međutim, ovakve neadekvatne proteze mogu dovesti do pojave oralnih lezija<sup>47</sup>.

Yeatts and Burns<sup>33</sup>, and Jankittivong et al.<sup>25</sup> published a prevalence of sublingual varices of less than 5%.

*Torus palatinus* is an exostosis which may be expressed differently with different shape and configuration<sup>34</sup>. In this study, 5.71 % of subjects had registered exostoses—*tori palatini* (Table 1). A similar prevalence of such exostoses was presented by Kurniawan et al.<sup>35</sup> while Mumcu et al.<sup>36</sup> presented a prevalence of *torus palatinus* under one percent (0.5%). In contrast to these studies, numerous other authors present a significantly higher prevalence of these exostoses in their studies<sup>33,37-39</sup>.

*Lingua geographica* is clinically presented with atrophic strongly erythematous areas of the dorsal surface of the tongue with irregular borders. The prevalence of this variation of the oral mucosa among the institutionalized persons presented in this study—4.29% (Table 1) is similar to the prevalence presented by Mansoir-Chanaei et al.<sup>40</sup> and Robledo-Sierra et al.,<sup>41</sup> unlike Yarom et al.<sup>42</sup> who showed higher prevalence of this mucosal alteration. The low frequency of this variation of mucosa is presented by Ferreira et al.<sup>2</sup>, Mozafari et al.<sup>27</sup> and Shulman and Carpenter<sup>43</sup>. Shulman and Carpenter<sup>43</sup> and Taivo et al.<sup>44</sup> in their study presented a strong association of benign migratory glossitis and *lingua plicata*.

The lingual frenulum as strong fibrous band that connects the tongue to the floor of the oral cavity among endodontic patients can affect the stability of the lower prosthesis. The results obtained in this study, about the presence of improperly positioned frenulum, is 1.43% (Table 1) and coincide with the findings presented by Lalakea and Messner<sup>45</sup> and Mujica et al.<sup>4</sup> Queiroz Marchesan<sup>46</sup> presents a higher prevalence of improperly positioned lingual frenulum in 9% of the elderly.

Stomatitis protetica and prosthetic hyperplasia are the most common lesions of the oral mucosa associated with wearing prosthetic devices. Prosthetic hyperplasia was presented in 10% of these subjects (Table 1). These results are similar to the findings of Mozafari et al.<sup>27</sup> and Mujica et al.<sup>4</sup>

Some authors believe that the elderly get used to to-extent prosthesis. Such inadequate dentures can lead to the occurrence of oral lesions<sup>47</sup>. High number of lesions associated with wearing prosthetic devices in most cases, except for instability of dentures, is due to inadequate oral hygiene and irregular dental check-ups<sup>48</sup>.

Velik broj lezija povezanih sa nošenjem protetičkih sredstava uglavnom nastaje (osim prilikom nestabilnosti proteza) usled neadekvatne oralne higijene i neredovnih stomatoloških pregleda<sup>48</sup>.

*Stomatitis protetica* predstavlja kliničku dijagnozu koja opisuje zapaljenjsko stanje oralnog tkiva koje je povezano sa nošenjem mobilnih protetičkih sredstava. Klinički se manifestuje prisustvom mesta eritema u kontaktu sa bazom proteze, erozija i čireva, te prisustvom otoka i bolova. Premda brojni faktori mogu izazvati ovo stanje, pojedini autori ukazuju na to da dominantnu ulogu imaju loša oralna higijena<sup>49</sup>, *Candida* spp.<sup>50,51</sup> i neodgovarajuća dimenzija protetičkih sredstava<sup>52</sup>. Incidencija *stomatitis protetica* potvrđena u Sjedinjenim Američkim Državama iznosi 21%; oko 40% starijih osoba u ustanovama u Danskoj imalo je izvesne poteškoće da se lokalizuje pod protetičkim aparatima. Smatra se da se protetički stomatitis javlja kod otprilike jedne trećine starijih osoba u ustanovama koje nose protetička sredstva<sup>53</sup>. Prevalencija protetičkog stomatitisa od 10.00% (Tabela 1) zabeležena u ovom istraživanju manja je od prevalencije koja je prikazana u drugim studijama i iznosi više od 15%<sup>54,55</sup>. Veruje se da je ovako slabo prisustvo protetičkog stomatitisa povezano sa slabim prisustvom protetičkih uređaja testiranih kod starijih osoba.

Smatra se da je hiperplazija proteze posledica proširenih krila i ivica proteze, ali i odsustva bliskog kontakta između baze proteze i oralnog tkiva ispod<sup>48,56</sup>. Ferreira et al.<sup>2</sup>, Baran i Nalcaci<sup>57</sup> i Jorge Junior J. et al.<sup>58</sup> uočili su prisustvo hiperplazije veće od onog u našem istraživanju – 8.57% (Tabela 1). Podaci o prisustvu protetičke hiperplazije koje su prezentovali Mujica et al.<sup>4</sup> i Corbet et al.<sup>59</sup> slični su podacima do kojih se u ovom istraživanju došlo. Jankittivong et al.<sup>25</sup> i Ferreira et al.<sup>2</sup> ukazali su na prisustvo traumatskih ulkusa slično onom iz naše studije – 15.71% (Tabela 1). Baran i Nalcaci<sup>60</sup> i Moskona i Kaplan<sup>61</sup> pokazali su pak da su traumatski ulkusi u većoj meri prisutni kod starijih osoba u ustanovama. Mujica et al.<sup>4</sup>, Mozafari et al.<sup>27</sup>, Espinosa et al.<sup>62</sup> i Garcia-Pola Vallejo et al.<sup>63</sup> pomenuli su manju prevalenciju traumatskih ulceracija uzrokovanih nošenjem protetičkih aparata.

Prema mišljenju mnogih autora, angularni heilitis povezan je sa problemima temporomandibularnog zgloba<sup>64</sup>, protetičkim stomatitisom<sup>48,64</sup> ili inflamatornom fibroznom hiperplazijom<sup>48</sup>. Prevalencija angularnog heilitisa predstavljena u radovima čiji su autori Thomson et al.<sup>65</sup> i Nimri et al.<sup>66</sup> slična je prevalenciji angularnog heilitisa na koju je

Stomatitis protetica is a clinical diagnosis that describes an inflammatory condition of oral tissues associated with wearing mobile prosthetic devices. Clinically it is manifested by the presence of erythema which is in contact with the prosthetic base, erosions and ulcers, and the presence of swelling and pain. Numerous factors can cause this condition, some authors indicate that the predominant role plays poor oral hygiene<sup>49</sup>, *Candida* spp.,<sup>50,51</sup> and inadequate dimension of the prosthetic device<sup>52</sup>. Incidence of stomatitis protetica present in the United States of America is 21%, and about 40% of the institutionalized elderly in Denmark have some difficulty located under prosthetic devices. It is believed that stomatitis protetica occurs in approximately one third of the institutionalized elderly who wear prosthetic devices<sup>53</sup>. The prevalence of prosthetic stomatitis of 10.00% (Table 1) registered in this research is less than the prevalence of stomatitis that is presented in other studies and is over 15%<sup>54,55</sup>. It is considered that this low prevalence of prosthetic stomatitis is due to the low number of prosthetic devices tested in the elderly.

Prosthetic hyperplasia is a consequence of extended prosthetic wings and edges, but also occurs due to the absence of close contact between the prosthesis base and oral tissue underneath<sup>48,56</sup>. Ferreira et al.<sup>2</sup>, Baran and Nalcaci<sup>57</sup> and Jorge Júnior J et al.<sup>58</sup> observed a higher presence of this hyperplasia, compared with this survey—8.57% (Table 1). Similar to these results, data about the presence of prosthetic hyperplasia registered by Mujica et al.<sup>4</sup> and Corbet et al.,<sup>59</sup> Jankittivong et al.<sup>25</sup> and Ferreira et al.<sup>2</sup> demonstrated the presence of traumatic ulcers similar to those obtained in this study—15.71% (Table 1). Baran and Nalcaci<sup>60</sup> and Moskona and Kaplan<sup>61</sup> indicated a higher presence of traumatic ulcers in institutionalized elderly. Mujica et al.,<sup>4</sup> Mozafari et al.<sup>27</sup> Espinosa et al.<sup>62</sup> and Garcia-Pola Vallejo et al.<sup>63</sup> published a smaller prevalence of traumatic ulceration caused by wearing prosthetic devices.

According to many authors, angular cheilitis is associated with problems of temporomandibular joint<sup>64</sup>, prosthetic stomatitis<sup>48,64</sup> or inflammatory fibrous hyperplasia<sup>48</sup>. Thomson et al.<sup>65</sup> and Nimri et al.<sup>66</sup> presented the prevalence of angular cheilitis, similar to the prevalence of angular cheilitis in this study (Table 1). Smaller prevalence of angular cheilitis is presented by Mujica et al.,<sup>4</sup> King and Kapadia<sup>67</sup> and Jorge Júnior J. et al.<sup>67</sup> In contrast, higher prevalence of angular cheilitis is noted by Samaranayake et al.<sup>18</sup> and Peltola et al.<sup>68</sup> in their research.

naše ispitivanje ukazalo (Tabela 1). Mnogo manje prisustvo angularnog heilitisa pomenuli su Mujica et al.<sup>4</sup>, King i Kapadia<sup>67</sup> i Jorge Junior J. et al.<sup>58</sup>. Nasuprot tome, Samaranaiake et al.<sup>18</sup> i Peltola et al.<sup>68</sup> zapazili su veću prevalenciju angularnog heilitisa.

Atrofične promene dorzalnog jezika česte su promene na leđnoj površini jezika kod starijih osoba. Naše istraživanje je pokazalo da su ove promene prisutne kod 12.86% (Tabela 1) starijih osoba smeštenih u ustanove, što je u skladu sa rezultatima koje su dobili Thomson et al.<sup>65</sup>, Kurniawan et al.<sup>35</sup>, Mozafari et al.<sup>27</sup> i Sveeni et al.<sup>69</sup>. Ferreira et al.<sup>2</sup> i Triantos<sup>28</sup> ukazali su pak na manju prevalenciju atrofičnih promena na jeziku kod starijih osoba u ustanovama.

Rekurentni aftozni stomatitis veoma je česta bolest među različitim rasnim i etničkim populacijama i može se manifestovati u različitim periodima života. Reč je o bolesti nepoznate etiologije. Prevalencija aftoznih promena u ovoj studiji iznosila je 5.71% (Tabela 1), što je vrednost niža od one dobijene u studiji koju su sprovedeli Dandgore-Khasbage et al. (19,33%)<sup>70</sup>. Brojne druge studije otkrile su značajno manju zastupljenost rekurentnog aftoznog stomatitisa kod starijih osoba u ustanovama<sup>2,4,63,71,72</sup>.

Od 80% do 90% stanovništva imalo je bar jednu epizodu rekurentnog labijalnog herpesa do pedesete godine života<sup>73</sup>. Zbog oslabljenog imuniteta, pojava ove bolesti retka je kod starijih osoba. Prisustvo rekurentnog labijalnog herpesa među našim ispitanicima (2.86% (Tabela 1)) bilo je veće nego u drugim objavljenim rezultatima<sup>2,4,27</sup>.

Hemangiomi u usnoj duplji nisu toliko česti. Ipak, kada se vrši poređenje sa drugim mestima, primećuje se da su glava i vrat mesta na kojima se hemangiomi najčešće pojavljuju. Otprilike od 10% do 20% hemangioma postaje vidljivo kasnije u toku života<sup>74</sup>. Prisustvo hemangioma među ispitanicima u ovoj studiji iznosilo je 2.86% (Tabela 1), što se poklapa sa rezultatima do kojih su došli Garcia-Pola Vallejo et al.<sup>63</sup> i Triantos<sup>28</sup>. Mujica et al.<sup>4</sup> zabeležili su veću prevalenciju ove vaskularne malformacije, dok je u jednoj publikaciji Mozafarija et al.<sup>27</sup> predstavljen manji prikaz ovog benignog stanja.

*Lichen planus* je relativno česta bolest usne šupljine i kože, koja uglavnom pogađa od 0,5% do 2,0% opšte populacije<sup>75</sup>. Rezultati naše studije ukazali su na to da je pomenuta oralna promena u ovoj specifičnoj populaciji bila prisutna u 1,43% slučajeva (Tabela 1),

Atrophic change in the dorsum linguae is quite frequent change on the dorsal surface of the tongue in the elderly. According to this research, these changes are present in 12.86% (Table 1) of the institutionalized elderly and are consistent with the findings of Thomson et al.<sup>65</sup> and Kurniawan et al.<sup>35</sup>. Significantly higher prevalence of atrophic change in the tongue is found by Mozafari et al.<sup>27</sup> and Sweeny et al.<sup>69</sup>. Ferreira et al.<sup>2</sup> and Triantos<sup>28</sup> are indicating smaller prevalence of atrophic changes on the tongue among the institutionalized elderly.

Recurrent aphthous stomatitis is a very common disease among different racial and ethnic populations and can manifest in various ages. This is a disease with unknown aetiology. Revealed prevalence of aphthous changes in this study was 5.71% (Table 1). This value is lower than the presented in one study by Dandgore-Khasbage et al.<sup>70</sup> (19.33%). Numerous other studies have found significantly lower representation of recurrent aphthous stomatitis in institutionalized elderly<sup>2,4,63,71,72</sup>.

Until the fiftieth year of life, 80–90% of the population have experienced at least one episode of recurrent labial herpes<sup>73</sup>. Due to reduced immunity, in older persons there is a rare occurrence of this disease. In this study, the presence of recurrent labial herpes of 2.86% (Table 1) is higher compared to other published results<sup>2,4,27</sup>.

Hemangiomas in the oral cavity are not that common, but if a comparison is made with other body sites, the head and neck are the places where hemangiomas usually appear. Approximately 10 to 20% of hemangiomas become visible later in life<sup>74</sup>. The presence of hemangiomas described in this study is 2.86% (Table 1), which coincides with the results of Garcia-Pola Vallejo et al.<sup>63</sup> and Triantos<sup>28</sup>. Mujica et al.<sup>4</sup> indicate a higher prevalence of this vascular malformation, unlike one publication of Mozafari et al.<sup>27</sup> where is presented smaller representation of this benign condition.

Lichen planus is a relatively common oral and skin disease, generally affecting 0.5 to 2.0% of the general population<sup>75</sup>. The results presented in this study indicate that the presence of this oral change in this specific population is 1.43% (Table 1), and they coincide with both the prevalence of the disease in the general population, and the results presented by Mozafari et al. for the institutionalized elderly<sup>27</sup>.

što nije u skladu samo sa prevalencijom bolesti u opštoj populaciji već i sa rezultatima koje su dobili Mozafari et al. u grupi starijih osoba u ustanovama<sup>4</sup>. Veću prevalenciju primetili su i Mujica et al.<sup>27</sup> i Garcia-Pola Vallejo et al.<sup>63</sup>. S druge strane, istraživanje koje su sproveli Ferreira et al.<sup>2</sup> pokazalo je manju prevalenciju ove oralne bolesti.

Visoka prevalencija oralnih lezija jedan je od glavnih razloga za preporuku sistematskih stomatoloških pregleda starijih osoba koje borave u ustanovama. Lezije koje imaju moguću malignu transformaciju izuzetno su važne, baš kao i njihova rana dijagnoza i adekvatno lečenje. Od naročitog je značaja kontinuirano praćenje registrovanih lezija oralne sluzokože sa malignim potencijalom, kao što su *lichen planus*, traumatski ulkusi i hiperplazija.

Iako su i navedene varijacije oralne sluzokože česte u usnoj duplji, najčešće patološke promene registrovane kod naših ispitanika bile su one povezane sa nošenjem proteza. Glazar et al.<sup>76</sup> i Evren et al.<sup>77</sup> primetili su da starije osobe smeštene u ustanove imaju značajno više mukoznih promena od starijih osoba koje nisu u ustanovama.

### **Zaključak**

U ispitivanoj populaciji posvedočeno je stopostotno prisustvo oralnih promena. U većini slučajeva reč je bila o varijacijama oralne sluzokože. Međutim, najvažnije patološke lezije bile su promene povezane sa nošenjem protetičkih sredstava. Takođe, veoma je važno naglasiti da patološke lezije zahtevaju stalno praćenje.

Higher prevalence is noticed by Mujica et al.<sup>4</sup> and Garcia-Pola Vallejo et al.<sup>63</sup> unlike Ferreira et al.<sup>2</sup> who showed a smaller prevalence of this oral disease.

The high prevalence of oral lesions is one of the main reasons for recommending systematic dental examination of the institutionalized elderly. Lesions that have possible malignant transformation are extremely important, and their early diagnosis and adequate treatment are very important. What is especially important is the continuous monitoring of registered oral mucosa lesions with malignant potential such as lichen planus, traumatic ulcers and hyperplasia.

Even though variations of the oral mucosa are more common in the oral cavity, the most common pathological changes which are registered among these subjects are associated with wearing prostheses. Glazar et al.<sup>76</sup> and Evren et al.<sup>77</sup> noted that the institutionalized elderly have significantly more mucosal changes in comparison with the non-institutionalized elderly.

### **Conclusion**

In the investigated population, we have a one hundred percent presence of oral changes. Most of them are variations of the oral mucosa. But the most important pathological lesions are the changes associated with wearing prosthetic devices. Also, it is very important to stress that pathological lesions require constant monitoring.

## LITERATURA/REFERENCES

1. Mason J, Pearce MS, Walls AW, Parker L, Steele JG. How do factors at different stages of the lifecourse contribute to oral-health-related quality of life in middle age for men and women?. *Journal of dental research*. 2006 Mar;85(3):257-61.
2. Ferreira RC, Magalhães CS, Moreira AN. Oral mucosal alterations among the institutionalized elderly in Brazil. *Brazilian oral research*. 2010;24:296-302.
3. Gift HC. Issues of aging and oral health promotion. *Gerodontology*. 1988 Oct 1;4(5):194-206.
4. Mujica V, Rivera H, Carrero M. Prevalence of oral soft tissue lesions in an elderly venezuelan population. *Medicina Oral Patologia Oral y Cirugia Bucal*. 2008 May 1;13(5):270.
5. Nevalainen MJ, Närhi TO, Ainamo A. Oral mucosal lesions and oral hygiene habits in the home-living elderly. *Journal of oral rehabilitation*. 1997 May;24(5):332-7.
6. Petrovski M, Terzieva-Petrovska O, Petrovska M, Kocovski D. Contemporary aspects of the medicament treatment of oropharyngeal candidiasis. *Vox Dentarii Информатор на стоматолошката комора на Македонија*. 2017(38):24-7.
7. Laurent M, Gogly B, Tahmasebi F, Paillaud E. Oropharyngeal candidiasis in elderly patients. *Geriatric et psychologie neuropsychiatrie du vieillissement*. 2011 Mar 1;9(1):21-8.
8. Ivanovski K, Pandilova M. *Oral Health*, Faculty of dentistry, Skopje, 2008
9. Satoh-Kuriwada S, Shoji N, Kawai M, Uneyama H, Kaneta N, Sasano T. Hyposalivation strongly influences hypogeusia in the elderly. *Journal of Health Science*. 2009;55(5):689-98.
10. Dundar N, Ilhan Kal B. Oral mucosal conditions and risk factors among elderly in a Turkish school of dentistry. *Gerontology*. 2007 Jan 5;53(3):165-72.
11. Rabiei M, Kasemnezhad E, Masoudi rad H, Shakiba M, Pourkay H. Prevalence of oral and dental disorders in institutionalised elderly people in Rasht, Iran. *Gerodontology*. 2010 Sep;27(3):174-7.
12. EKELUND R. Oral mucosal disorders in institutionalized elderly people. *Age and ageing*. 1988 Jan 1;17(3):193-8.
13. Petersen PE, Kjølner M, Christensen LB, Krustup U. Changing dentate status of adults, use of dental health services, and achievement of national dental health goals in Denmark by the year 2000. *Journal of Public Health Dentistry*. 2004 Sep;64(3):127-35.
14. de Lima Saintrain MV, Holanda TG, Bezerra TM, de Almeida PC. Prevalence of soft tissue oral lesion in elderly and its relations with deleterious habits. *Gerodontology*. 2012 Jun;29(2):130-4.
15. Antoun JS, Adsett LA, Goldsmith SM, Thomson WM. The oral health of older people: general dental practitioners' beliefs and treatment experience. *Special Care in Dentistry*. 2008 Jan;28(1):2-7.
16. Yu DS, Lee DT, Hong AW, Lau TY, Leung EM. Impact of oral health status on oral health-related quality of life in Chinese hospitalised geriatric patients. *Quality of Life Research*. 2008 Apr;17:397-405.
17. Kenkre AM, Spadigam AE. Oral health and treatment needs in institutionalized psychiatric patients in India. *Indian journal of dental research: official publication of Indian Society for Dental Research*. 2000 Jan 1;11(1):5-11.
18. Samaranyake LP, Wilkieson CA, Lamey PJ, MacFarlane TW. Oral disease in the elderly in long-term hospital care. *Oral diseases*. 1995 Sep;1(3):147-51.
19. Smith RG, Burtner AP. Oral side-effects of the most frequently prescribed drugs. *Special care in dentistry*. 1994 May;14(3):96-102.
20. Avcu N, Ozbek M, Kurtoglu D, Kurtoglu E, Kansu O, Kansu H. Oral findings and health status among hospitalized patients with physical disabilities, aged 60 or above. *Archives of gerontology and geriatrics*. 2005 Jul 1;41(1):69-79.
21. Campisi G, Margiotta V. Oral mucosal lesions and risk habits among men in an Italian study population. *Journal of oral pathology & medicine*. 2001 Jan;30(1):22-8.
22. Solemdal K, Sandvik L, Willumsen T, Mowe M, Hummel T. The impact of oral health on taste ability in acutely hospitalized elderly. *PLoS one*. 2012 May 3;7(5):e36557.
23. Lawahez El-Sayed MI, Saleh MS. Oral Mucosal Lesions and Associated Factors among Institutionalized Elderly in Alexandria. *Jorn EDA*. Oct 2000;46 (4.3):2211
24. Olivier JH. Fordyce granules on the prolabial and oral mucous membranes of a selected population. *SADJ: Journal of the South African Dental Association= Tydskrif van die Suid-afrikaanse Tandheelkundige Vereniging*. 2006 Mar 1;61(2):072-4.
25. Jainkittivong A, Aneksuk V, Langlais RP. Oral mucosal conditions in elderly dental patients. *Oral diseases*. 2002 Jul;8(4):218-23.
26. Jainkittivong A, Aneksuk V, Langlais RP. Oral mucosal lesions in denture wearers. *Gerodontology*. 2010 Mar;27(1):26-32.
27. Mozafari PM, Dalirsani Z, Delavarian Z, Amirchaghmaghi M, Shakeri MT, Esfandiyari A, Falaki F. Prevalence of oral mucosal lesions in institutionalized elderly people in Mashhad, Northeast Iran. *Gerodontology*. 2012 Jun;29(2):e930-4.
28. Triantos D. Intra-oral findings and general health conditions among institutionalized and non-institutionalized elderly in Greece. *Journal of oral pathology & medicine*. 2005 Nov;34(10):577-82.
29. Mallo L, Gerardo-Rodriguez G, Goiriena FJ, Lafuente R. Pathology of the oral mucosa in the Spanish institutionalized elderly. *Medicina Oral: Organo Oficial de la Sociedad Espanola de Medicina Oral y de la Academia Iberoamericana de Patologia y Medicina Bucal*. 2000 May 1;5(3):177-86.
30. Susmita S, Mandeep K, Anushree S. Unusual presentation of palatal varicosities. *Journal of Oral and Maxillofacial Pathology*. 2006 Jan 1;10(1):15-6.
31. Ugar-Cankal D, Denizci S, Hocaoglu T. Prevalence of tongue lesions among Turkish. *Saudi Med J*. 2005;26(12):1962-7.
32. Kovač-Kavčič M, Skalerič U. The prevalence of oral mucosal lesions in a population in Ljubljana, Slovenia. *Journal of oral pathology & medicine*. 2000 Aug;29(7):331-5.

33. Yeatts D, Burns JC. Common oral mucosal lesions in adults. *Am Fam Physician*. 1991 Dec 1;44(6):2043-50.
34. Jankulovska E. Total prosthesis-preclinics. Faculty of dentistry, Skopje, 2005 :3-10
35. Kurniawan A, Wimardhani YS, Rahmayanti F. Oral health and salivary profiles of geriatric outpatients in Cipto Mangunkusumo General Hospital. *Age (year)*. 2010 Aug 30;60(63):8.
36. Mumcu GO, Cimilli H, Sur H, Hayran O, Atalay T. Prevalence and distribution of oral lesions: a cross-sectional study in Turkey. *Oral diseases*. 2005 Mar;11(2):81-7.
37. Yoshinaka M, Ikebe K, Furuya-Yoshinaka M, Hazeyama T, Maeda Y. Prevalence of torus palatinus among a group of Japanese elderly. *Journal of Oral Rehabilitation*. 2010 Nov;37(11):848-53.
38. Al Quran FA, Al-Dwairi ZN. Torus palatinus and torus mandibularis in edentulous patients. *J Contemp Dent Pract*. 2006 May 1;7(2):112-9.
39. Šimunković SK, Božić M, Alajbeg IZ, Dulčić N, Boras VV. Prevalence of torus palatinus and torus mandibularis in the Split-Dalmatian County, Croatia. *Collegium antropologicum*. 2011 Sep 1;35(3).
40. Amiri M, Chaman R, Raei M, Shirvani SD, Afkar A. Preparedness of hospitals in north of Iran to deal with disasters. *Iranian Red Crescent Medical Journal*. 2013 Jun;15(6):519.
41. Robledo-Sierra J, Mattsson U, Svedensten T, Jontell M. The morbidity of oral mucosal lesions in an adult Swedish population. *Medicina oral, patologia oral y cirugía bucal*. 2013 Sep;18(5):e766.
42. Yarom N, Cantony U, Gorsky M. Prevalence of fissured tongue, geographic tongue and median rhomboid glossitis among Israeli adults of different ethnic origins. *Dermatology*. 2004;209(2):88-94.
43. Shulman JD, Carpenter WM. Prevalence and risk factors associated with geographic tongue among US adults. *Oral diseases*. 2006 Jul;12(4):381-6.
44. Taiwo JO, Kolude B, Akinmoladun V. Oral mucosal lesions and temporomandibular joint impairment of elderly people in the South East Local Government Area of Ibadan. *Gerodontology*. 2009 Sep;26(3):219-24.
45. Lalakea ML, Messner AH. Ankyloglossia: the adolescent and adult perspective. *Otolaryngology—Head and Neck Surgery*. 2003 May;128(5):746-52.
46. Queiroz Marchesan I. Lingual frenulum: classification and speech interference. *Int J Orofacial Myology*. 2004 Nov;30:31-8.
47. Uludamar A, Evren BA, Işeri U, Özkan YK. Oral health status and treatment requirements of different residential homes in Istanbul: a comparative study. *Archives of Gerontology and Geriatrics*. 2011 Jul 1;53(1):e67-74.
48. Freitas JB, Gomez RS, De Abreu MH, Ferreira e Ferreira E. Relationship between the use of full dentures and mucosal alterations among elderly Brazilians. *Journal of oral rehabilitation*. 2008 May;35(5):370-4.
40. Petrovski M, Kovacevska I, Terzieva-Petrovska O, Papakoca K, Minovska A, Carceva-Salja S. Oral health assessment among elderly in long term residences. *Knowledge-International Journal, Scientific and Applicative Papers*. 2018;26(4):1347-54.
49. Pires FR, Santos EB, Bonan PR, De Almeida OP, Lopes MA. Denture stomatitis and salivary *Candida* in Brazilian edentulous patients. *Journal of oral rehabilitation*. 2002 Nov;29(11):1115-9.
50. Kossioni AE. The prevalence of denture stomatitis and its predisposing conditions in an older Greek population. *Gerodontology*. 2011 Jun;28(2):85-90.
51. Gendreau L, Loewy ZG. Epidemiology and etiology of denture stomatitis. *Journal of Prosthodontics: Implant, Esthetic and Reconstructive Dentistry*. 2011 Jun;20(4):251-60.
52. Kuc IM, Samaranayake LP, Van Heyst EN. Oral health and microflora in an institutionalised elderly population in Canada. *International Dental Journal*. 1999 Feb;49(1):33-40.
53. Atashrazm P, Sadri D. Prevalence of oral mucosal lesions in a group of Iranian dependent elderly complete denture wearers. *The journal of contemporary dental practice*. 2013 Aug 1;14(2):174-8.
54. Marchini L, Vieira PC, Bossan TP, Montenegro FL, Cunha VP. Self-reported oral hygiene habits among institutionalised elderly and their relationship to the condition of oral tissues in Taubaté, Brazil. *Gerodontology*. 2006 Mar;23(1):33-7.
55. Petrovski M, Papakoca K, Terzieva-Petrovska O, Proseva L, Arsovski L, Atanasova S. Impact of The Nurses on Maintaining Oral Health in Institutionalized Elderly. *Lupine online journal of nursing & health care*. 2021 Jun 4;3(2):292-5.
56. Kulak-Ozkan Y, Kazazoglu E, Arikan A. Oral hygiene habits, denture cleanliness, presence of yeasts and stomatitis in elderly people. *Journal of oral rehabilitation*. 2002 Mar;29(3):300-4.
57. Baran I, Nalçacı R. Self-reported denture hygiene habits and oral tissue conditions of complete denture wearers. *Archives of gerontology and geriatrics*. 2009 Sep 1;49(2):237-41.
58. Junior JJ, de Almeida OP, Bozzo L, Scully C, Graner E. Oral mucosal health and disease in institutionalized elderly in Brazil. *Community dentistry and oral epidemiology*. 1991 Jun;19(3):173-5.
59. Corbet EF, Holmgren CJ, Philipsen HP. Oral mucosal lesions in 65–74-year-old Hong Kong Chinese. *Community dentistry and oral epidemiology*. 1994 Oct;22(5):392-5.
60. Baran I, Nalcaci R. Self-reported problems before and after prosthodontic treatments according to newly created Turkish version of oral health impact profile. *Archives of Gerontology and Geriatrics*. 2011 Sep 1;53(2):e99-105.
61. Moskona D, Kaplan I. Oral health and treatment needs in a non-institutionalized elderly population: experience of a dental school associated geriatric clinic. *Gerodontology*. 1995 Dec;12(2):95-8.
62. Espinoza I, Rojas R, Aranda W, Gamonal J. Prevalence of oral mucosal lesions in elderly people in Santiago, Chile. *Journal of oral pathology & medicine*. 2003 Nov;32(10):571-5.
63. Garcia-Pola Vallejo MJ, Martinez Diaz-Canel AI, Garcia Martin JM, Gonzalez Garcia M. Risk factors for oral soft tissue lesions in an adult Spanish population. *Community dentistry and oral epidemiology*. 2002 Aug;30(4):277-85.
64. Milstein L, Rudolph MJ. Oral health status in an institutionalised elderly Jewish population. *SADJ: Journal of the South African Dental Association= Tydskrif van die Suid-afrikaanse Tandheelkundige Vereniging*. 2000 Jun 1;55(6):302-6.
65. Thomson WM, Brown RH, Williams SM. Dentures, prosthetic treatment needs, and mucosal health in an institutionalized elderly population. *NZ Dent J*. 1992 Apr 1;88(392):51.

66. Nimri GM. ORAL CONDITION OF GERIATRIC "DENTURE WEARERS". JRMS. 2004 Jun;11(1):30-4.
67. King T, Kapadia D. elderly and disadvantaged population in Fiji (1997). PACIFIC HEALTH DIALOG. 2003;10(1).
68. Peltola P, Vehkalahti MM, Wuolijoki-Saaristo K. Oral health and treatment needs of the long-term hospitalised elderly. Gerodontology. 2004 Jun;21(2):93-9.
69. Sweeney MP, Bagg J, Fell GS, Yip B. The relationship between micronutrient depletion and oral health in geriatrics. Journal of oral pathology & medicine. 1994 Apr;23(4):168-71.
70. Dangore-Khasbage S, Khairkar PH, Degwekar SS, Bhowate RR, Bhake AS, Singh A, Lohe VK. Prevalence of oral mucosal disorders in institutionalized and non-institutionalized psychiatric patients: a study from AVBR Hospital in central India. Journal of oral science. 2012;54(1):85-91.
71. Lin HC, Corbet EF, Lo EC. Oral mucosal lesions in adult Chinese. Journal of dental research. 2001 May;80(5):1486-90.
72. Vigild M. Oral mucosal lesions among institutionalized elderly in Denmark. Community dentistry and oral epidemiology. 1987 Dec;15(6):309-13.
73. Harmenberg J, Öberg B, Spruance S. Prevention of ulcerative lesions by episodic treatment of recurrent herpes labialis: a literature review. Acta dermato-venereologica. 2010 Jan 18;90(2):122-30.
74. Fevurly RD, Fishman SJ. Vascular Anomalies. Rickham's Neonatal Surgery. 2018:999-1020.
75. McCreary CE, McCartan BE. Clinical management of oral lichen planus. British Journal of Oral and Maxillofacial Surgery. 1999 Oct 1;37(5):338-43.
76. Glazar I, Urek MM, Brumini G, Pezelj-Ribaric S. Oral sensorial complaints, salivary flow rate and mucosal lesions in the institutionalized elderly. Journal of oral rehabilitation. 2010 Feb;37(2):93-9.
77. Evren BA, Uludamar A, Işeri U, Ozkan YK. The association between socioeconomic status, oral hygiene practice, denture stomatitis and oral status in elderly people living different residential homes. Archives of gerontology and geriatrics. 2011 Nov 1;53(3):252-7.