

## Epidemiological Study of Oral and Maxillofacial Biopsies from Geriatric Patients in Zahedan, Iran (1996-2015)

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### Abstract

**Introduction:** As a result of aging process, oral mucosa becomes susceptible to oral diseases. Having knowledge about prevalence and distribution of geriatric oral diseases is essential for prevention and treatment planning. This study aimed to evaluate the prevalence of geriatric patients' oral biopsies in specimens obtained in medical centers of Zahedan University of Medical Sciences. **Methods:** This cross-sectional study was conducted on 2496 cases of biopsied oral lesions found in pathology archive of medical centers of Zahedan University of Medical Sciences throughout a 20-year period. Information about age, gender, lesion location and type of oral lesions of patients over 60 years old were collected and analyzed using SPSS software. **Results:** In this cross-sectional study, 412 (16.5%) biopsy samples were taken from patients over 60 years old. Most subjects were in their seventh decade (59.5%), male (56.1%) and soft tissue (96.6%). Two hundred and sixty (63.1%) cases were neoplastic lesions and 152 (36.9%) were non-neoplastic. There was no significant relationship between the type of lesions (neoplastic and non-neoplastic) and age, gender and their location. The most prevalent lesions were oral squamous cell carcinoma (42.5%), non-specific inflammatory lesions (7.8%), irritation fibroma (3.4%) and oral verrucous carcinoma (3.4%). **Conclusion:** Since the malignant lesions were the most common oral lesions in the studied geriatric patients, oral health care must be prioritized in the general health policies.

**Key words:** Elderly, Oral pathology, Epidemiologic study

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### Introduction

Aging is an undeniable process, which is not fully known yet. However, the increased susceptibility and decreased adaptability to environmental stimulants, which may affect cells, organs and systems, are followed by the increased potential for experiencing diseases and death in this period of life (1). According to the World Health Organization (WHO), people with 60 years of age and older are considered as elderly (2). In recent years, the growth index of people over 60 years old showed an increasing trend. Likewise, this population increased from 7.22% in 2006 to 8.20% in 2011 in Iran and is predicted to reach 21.7% by 2050 (3).

As a result of aging process, the oral cavity of older people will not only become susceptible to dental caries and periodontal diseases but also to oral lesions (4). In addition to age, other factors such as gender, socio-economic status, smoking, wearing dentures, trauma, systematic diseases, medications and oral hygiene are among the effective factors in development of oral lesions (1, 4, 5). Oral lesions are among the main problems threatening oral health and are often associated with considerable pain and discomfort (6). The prevalence of oral mucosal lesions is an important parameter in evaluating older people's oral healthcare status, which is significant for health related planning (4). Despite the importance of this issue, there are few studies on the prevalence of oral

lesions, especially on their biopsies, compared to studies conducted on dental caries and periodontal diseases (6). Most studies conducted on geriatric oral lesions are clinical surveys (4, 5). Although the clinical examination of such lesions is important, it fails to direct us towards a final diagnosis of malignant and premalignant lesions (7). Since histopathologic evaluation is considered as the golden standard for diagnosis of such lesions (8), histopathologic diagnosis is essential to propose the best treatment for a disease (9); moreover, studies based on histopathologic diagnosis are more reliable (7).

Several studies in different regions have reported various prevalence rates and patterns for the biopsied oral lesions in the elderly. Pardis et al. (7) studied 231 archived samples of oral pathology department of Shiraz University of Medical Sciences and found that 17.7% of samples belonged to biopsies of older people; non-neoplastic lesions were the most common type of lesions and oral lichen planus (OLP), inflammatory fibrous hyperplasia, and oral squamous cell carcinoma (OSCC) were the most common lesions (7). In another study, Mohan et al. studied 964 oral biopsies from geriatric patients in India. Malignant neoplastic lesions, non-neoplastic lesions, potentially malignant disorders and benign neoplasms were the most common lesions, respectively. OSCC was the most common biopsied lesion in the elderly and most lesions were in the buccal mucosa (10). Since the frequency of oral and maxillofacial biopsies among geriatric patients in medical centers of Zahedan University of Medical Sciences have not been studied so far, in this study we tried to investigate this issue to pave the way for better planning on prevention and treatment of the geriatrics' oral lesions.

### Materials and Methods

After obtaining confirmation from the morale committee of Zahedan University of Medical Sciences (code 7506), this retrospective cross-sectional study was conducted on 2496 oral biopsied lesions in pathology archive of medical centers of the aforesaid university including Khatamalanbia Hospital and the Dental faculty (two main centers for oral lesions) from 1996 to 2015. An oral and maxillofacial pathologist revised all histopathologic slides. Information about age, gender, lesion location and type of oral lesions of patients over 60 years of age was collected. The lesions were divided into two groups; neoplastic and non-neoplastic lesions. Finally, using SPSS software version 21 (Chicago, IL, USA), data was arranged as tables and then analyzed with chi-square test and  $P < 0.05$  was considered significant.

### Results

In this study, 412 (16.5%) biopsied oral samples belonged to geriatric patients with the average age of  $68.5 \pm 7.6$  years (60-104 year) most of which belonged to males (56.1%). Two hundred and sixty (63.1%) samples were neoplastic and 152 (36.9%) were non-neoplastic lesions. 58.1 percent of neoplastic and 52.6% of non-neoplastic lesions belonged to men; however, this slight overrepresentation was not statistically significant (chi-square test,  $P = 0.304$ ).

The average ages of patients with neoplastic and non-neoplastic lesions were  $68.6 \pm 7.9$  and  $68.4 \pm 7.2$  years, respectively. 59.5 percent of lesions were observed in 60 to 69-year-old patients; 29.6% of lesions were observed in 70 to 79-year-old patients and 10.9% of lesions were observed in 80-year-old and more patients. There was not any significant relationship between neoplastic and non-neoplastic lesions and age groups (chi-square test,  $P = 0.865$ ) (Table 1 and 2).

Out of 412 samples, 398 (96.6%) were found in soft tissue. Neoplastic and non-neoplastic lesions occurred in soft tissue in 98.1% and 94.1% cases, respectively (chi-square test,  $P = 0.046$ ). Five cases of neoplastic lesions (central ossifying fibroma, mucoepidermoid carcinoma, small cell round tumor, lymphoma and OSCC) and nine cases of non-neoplastic lesions (4 cases of osteomyelitis and 3 cases of residual cysts and 2 cases of odontogenic keratocyst) were located in alveolar bone. Table 3 shows the detailed location distribution of neoplastic and non-neoplastic lesions.

The most common lesions in this study were OSCC (42.5%), non-specific inflammatory lesions (7.8%), irritation fibroma (3.4%), oral verrucous carcinoma (OVC) (3.4%). Papilloma and pleomorphic adenoma were the most common benign tumors and OSCC and OVC were the most common malignant tumors in geriatric patients (Table 1).

Non-neoplastic lesions were divided into four groups: premalignant, cystic, reactive/inflammatory and others. OLP, residual cyst and non-specific inflammatory lesions were the most common premalignant, cystic and reactive/inflammatory lesions respectively (Table 2). The "Others" category included samples without any final histopathologic diagnosis

**Table 1.** Age and gender distribution of neoplastic lesions in elderly patients

Neoplastic Lesions	Gender			Age groups (yr.)		
	Male	Female	Total	60-69	70-79	80≤
<b>Benign tumors</b>						
Pleomorphic adenoma	3	5	8	4	3	1
papilloma	3	5	8	5	2	1
Keratoacanthoma	4	2	6	4	2	0
Hemangioma	1	2	3	2	0	1
Schwannoma	1	0	1	1	0	0
Central ossifying fibroma	0	1	1	1	0	0
Peripheral odontogenic fibroma	1	0	1	0	1	0
<b>Total</b>	<b>13</b>	<b>15</b>	<b>28</b>	<b>17</b>	<b>8</b>	<b>3</b>
<b>Malignant tumors</b>						
Oral squamous cell carcinoma	110	65	175	103	52	20
Oral verrucous carcinoma	7	7	14	11	1	2
Basal cell carcinoma	4	8	12	6	5	1
Nasopharyngeal carcinoma	2	1	3	2	1	0
Basaloid squamous carcinoma	1	0	1	1	0	0
Metastatic carcinoma	0	1	1	1	0	0
Adenoid cystic carcinoma	3	3	6	4	2	0
Mucoepidermoid carcinoma	1	1	2	0	2	0
Malignant mixed tumor	1	0	1	1	0	0
Polymorphous low-grade adenocarcinoma	0	1	1	1	0	0
Fibrosarcoma	1	0	1	1	0	0
Kaposi's sarcoma	1	0	1	0	1	0
Lymphoma	6	5	11	2	5	4
Eosinophilic granuloma	0	1	1	1	0	0
Small cell round tumor	1	1	2	2	0	0
<b>Total</b>	<b>138</b>	<b>94</b>	<b>232</b>	<b>136</b>	<b>69</b>	<b>27</b>
<b>Total</b>	<b>151</b>	<b>109</b>	<b>260</b>	<b>153</b>	<b>77</b>	<b>30</b>

**Table 2.** Age and gender distribution of non-neoplastic lesions in elderly patients

Non-neoplastic lesions	Gender			Age groups(yr.)		
	Male	Female	Total	60-69	70-79	80≤
<b>Premalignant lesions</b>						
Lichen planus	3	4	7	4	3	0
leukoplakia	2	3	5	3	1	1
Epithelial dysplasia	2	3	5	2	3	0
Actinic keratosis	1	0	1	0	1	0
Actinic cheilitis	2	0	2	1	1	0
<b>Total</b>	<b>10</b>	<b>10</b>	<b>20</b>	<b>10</b>	<b>9</b>	<b>1</b>
<b>Cystic lesions</b>						
Residual cyst	3	0	3	3	0	0
Odontogenic keratocyst	0	2	2	0	2	0
Epidermoid cyst	0	1	1	1	0	0
Thyroglossal duct cyst	1	0	1	0	1	0
<b>Total</b>	<b>4</b>	<b>3</b>	<b>7</b>	<b>4</b>	<b>3</b>	<b>0</b>
<b>Reactive/inflammatory lesions</b>						
Fibroma	4	10	14	12	1	1
Pyogenic granuloma	6	3	9	6	3	0
Peripheral giant cell granuloma	2	1	3	3	0	0
Peripheral ossifying fibroma	1	1	2	2	0	0
Non-specific inflammatory lesions	22	10	32	17	8	7
Pseudoepitheliomatous hyperplasia	8	3	11	6	3	2
Non specific ulceration	4	6	10	4	5	1
Osteomyelitis	2	2	4	3	1	0
Sialadenitis	1	3	4	4	0	0
Mucocele	0	1	1	0	1	0
Lichenoid reaction	0	2	2	2	0	0
Infectious lesions	2	1	3	2	1	0
<b>Total</b>	<b>52</b>	<b>43</b>	<b>95</b>	<b>61</b>	<b>23</b>	<b>11</b>
Others	14	16	30	17	10	3
<b>Total</b>	<b>80</b>	<b>72</b>	<b>152</b>	<b>92</b>	<b>45</b>	<b>15</b>

**Table 3.** Location distribution of neoplastic and non-neoplastic lesions in elderly patients

Pathological diagnosis	Locations (%)										Total
	Tongue	Maxillary gingiva	Mandibular gingiva	Buccal mucosa	Labial mucosa	Palate	Floor of mouth	Alveolar bone	pharynx	Others	
<b>Neoplastic lesions</b>	15 (5.8%)	8 (3.1%)	77 (29.6%)	16 (6.2%)	39 (15%)	2 (0.8%)	9 (3.5%)	5 (1.9%)	33 (12.7%)	56 (21.5%)	260 (100%)
<b>Non-neoplastic lesions</b>	16 (10.5%)	9 (5.9%)	13 (8.6%)	13 (8.6%)	28 (18.4%)	4 (2.6%)	7 (4.6%)	9 (5.9%)	16 (10.5%)	37 (24.3%)	152 (100%)
<b>Total</b>	31 (7.5%)	17 (4.1%)	90 (21.8%)	29 (7.0%)	67 (16.3%)	6 (1.5%)	16 (3.9%)	14 (3.4%)	49 (11.9%)	93 (22.6%)	412 (100%)

## Discussion

This study showed that 16.5% of biopsied oral lesions were prepared from geriatric patients; its findings were consistent with the findings of Lei et al. in Taiwan (17%) and Pardis et al. in Shiraz, Iran (17.7%) (7, 11). Various studies have shown the prevalence of oral biopsies from geriatric patients to be between 9.3% and 24.1% (9, 10). This different prevalence of oral biopsies in older people is due to genetic and geographical differences, oral habits, study duration and age range.

Similar to the present study, most studies conducted on biopsies from patients over 60, reported that oral lesions were mostly found in the seventh decade of life (2, 7, 9, 11). High frequency of oral lesions in this decade of life highlights the necessity of better preventive activities to decrease morbidity and mortality of geriatric patients. The frequency of oral lesions was decreased in later decades, which was consistent with other studies (2, 7, 8, 11). Ignoring oral lesions and failure in referring to medical centers are the major reasons explaining fewer oral biopsies in very old patients (10).

Similar to studies conducted by Mohan et al. and Lei et al. (10, 11), the prevalence of oral lesions in this study was higher in men (56.1%) than women. Lei et al. reported that oral lesions in men are two times more prevalent than in women (11). Other studies have reported that the prevalence of oral lesions is higher in female elderly patients (2, 7-9, 12, 13). According to Dhanuthai et al., the higher prevalence of oral biopsies in Iranian geriatric men is due to their better access to medical and dental services (8). Mohan et al. concluded that the lower prevalence of tobacco use among women compared to men is the reason that oral lesions are less common among women (10); this fact is also applicable to the population studied in our study.

Carvalho et al. reported alveolar mucosa (19.1%) as the most common site for development of oral lesions (9). In this study, the most common location of oral lesions was mandibular mucosa. Other studies introduced buccal mucosa as the most common site for development of oral lesions (8, 10). It is necessary to note that in our population, oral habits including smokeless tobacco and pan using are among the etiological factors of the oral lesions and they are placed on the vestibular mucosa of mandible.

In the present study, neoplastic lesions had the highest prevalence; whereas other studies mentioned non-neoplastic lesions as the most prevalent (2, 7-9, 13, 14). Higher rate of cancers in geriatrics can be due to accumulation of mutations, insufficiency of DNA repair mechanisms and decreased protection of immune system against cancer cells (15).

OSCC was found as the most prevalent lesion which was consistent with other studies (8, 10, 11), whereas Carvalho et al. and Pardis et al., respectively, reported fibrous hyperplasia and OLP as the most common lesions (7, 9). Similar to other studies (2, 7-11, 13, 14), OSCC was the most common malignant lesion in geriatric patients. Most OSCCs are originated from premalignant lesions and ignoring premalignant lesions until they cause pain is considered as a reason for high prevalence of OSCC in geriatric patients (7). In Taiwan, high prevalence of Betel quid chewing was mentioned as a risk factor for OSCC (11). In the present study, there was a relationship between high prevalence of OSCC and using pan and smokeless tobacco in this province (Sistan and Baluchestan) (16).

Non-specific inflammatory lesions were the most common non-neoplastic lesion the prevalence of which was 7.8% in geriatric oral lesions; whereas fibrous hyperplasia was the most common inflammatory lesion in most studies (2, 7-9, 13). Lei et al. reported candida as the most common cause of inflammatory lesions (11). It has been believed that there is a relationship between inflammatory lesions in geriatric patients and using improper fixed and removable dental prostheses (9). On the other hand, aging makes oral mucosa susceptible to histopathologic changes such as decreasing cellular proliferation, thinning of the epithelium, destructive changes in collagen and losing submucosal elastin and fat. Decreasing saliva levels and immunologic changes in older people are also very common (1). All these make oral mucosa susceptible to development of inflammatory/reactive lesions.

It is necessary to note that histopathologic evaluation of oral lesions in geriatric patients usually underestimate the prevalence of oral lesions, because many lesions are only diagnosed through clinical profile and are not biopsied. Likewise, surgery operation and biopsy are not possible in some elderly with systemic diseases. Moreover, this study faced limitations such as lack of access to patients' information about smoking, tobacco use, existence of systemic diseases and medications.

## Conclusion

There were some similarities and differences between the prevalence rate of biopsied oral lesions from geriatric patients in this study and other studies conducted elsewhere. Most oral and maxillofacial biopsies were soft tissue samples obtained from men. The seventh decade of life was proved to be the most common period for experiencing oral lesions and OSCC was the most common biopsied oral lesion. Given the high rate of oral malignancies in geriatric people, dentists need to pay particular attention to this

age group to improve the quality of life in geriatrics through timely diagnosis and treatment of lesions.

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