Original article

Prevalence of oral mucosal lesions in nursing homes elderly people in western Iran

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ABSTRACT

Objective: The aim of this study to determine the prevalence of oral mucosal lesions in the elderly living in nursing homes in western Iran (Kermanshah).**Background:** This study was conducted in the elderly living in nursing homes in Kermanshah, western Iran.**Materials and methods:** This descriptive study was performed on 598 elderly people who lived in nursing home. Medical history, medication and demographic information were collected from the participants' medical records. This was performed through interview and examination to the instruction explained WHO.**Results:** A total of 598 elderly, 253 men and 345 women, were examined. Of all the elderly, 101 (16.9%) were smokers and 248 (41.5%) had dentures. The overall prevalence of lesions in the elderly was 52.5%. The most prevalent lesions in the population were xerostomia (37.6%), sublingual varicosity (25.8%), candidiasis (5%), and red and white lesions (4.7%). The most common systemic conditions in the population were hypertension (20.1%), depression (14.2%), and diabetes (6.2%). The elderly with hypertension were 1.743 times more likely to have oral lesions (Odds Ratio = 1.7; confidence interval = 1.15–2.63).**Conclusion:** Considering the observed oral manifestations and also the nature of aging and its consequent systemic conditions and the side effects of medications and other treatments, the elderly require carefully planned oral and dental health monitoring and care services with special consideration of their conditions.

1. Introduction

With the rise of global average life expectancy, the elderly constitute an increasing portion of the world's population.¹ Estimates suggest that by 2030, the world's elderly population percentage will increase from 9% to 16% and in Iran this percentage will increase from 6.5% to 17.5%.²

Chronic diseases, the weakened immune system, and the consumption of many medications are some of the most important factors that threaten the oral health of the elderly. Other factors, such as the use of dentures can also jeopardize the health of oral mucosa.³ In 2000, the prevalence of oral mucosal diseases in the elderly was in the range of 40–45%. Recent reports suggest that this ratio is currently about 29.9%.^{4,5} Unfortunately, many elderly do not believe in regular dental examinations and treatments or cannot afford them because of their pension and insurance conditions. Also, many of them accept the changes in their oral health as a natural outcome of aging.⁶ Despite the

great number of studies carried out on the subject of oral health, there is still not have enough information about the oral health of the elderly, partly because they often avoid participating in epidemiological studies.⁵ While most studies in this field are focused on the condition of teeth and periodontium, the oral health condition of the elderly also deserves due attention.⁷ In Iran, a few studies have examined the oral health conditions of the elderly in different parts of the country.^{8,9} Since there has been no such research on the elderly population of western parts of Iran, the present study was designed to investigate the oral health conditions of Iranians aged 60 and more (the elderly according to the WHO criteria) who are living in nursing homes of Kermanshah Province in western Iran.

2. Methods

This descriptive study was conducted on the elderly living in three nursing homes, two private and one public, in Kermanshah Province,

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Iran, in 2019. The Ethics Committee of Kermanshah University of Medical Sciences approved this study (No; IR.KUMS.REC.1398.263). All the people living in these nursing homes who were 60 years of age or older and were willing to participate and able to cooperate (by keeping the mouth open to allow examination) entered the study. Unwilling and uncooperative elderly people were excluded. Demographic information including age and gender, medical history and smoking habits were collected from their medical records. Examinations were performed by only one well-trained senior dental student. Before the examination, the goal of the study was explained to the potential subject and informed consent was obtained. Oral mucosa examination were performed by the use of mouth mirrors, tongue blade, sterile gauze, and flashlight and involved searching for oral lesions including, any abnormal alteration on the oral mucosa surface (red, white or ulcer) or any swelling, xerostomia (dry mouth sensation), and also recording the use of dentures (partial/complete removable prosthesis). An oral mucosal lesion is known as any abnormal alteration on the oral mucosa surface (red, white or ulcer) or any swelling. All developmental conditions such as, leucoedema, lingual varices, Fordyce granules, and fissured tongue were include in the present study. Oral lesions were diagnosed based on the WHO diagnostic criteria.¹⁰ The dental student performing the examination was trained in advance by a professor of oral medicine. The information related to each subject was recorded in a designed form with three sections dedicated to demographic information, medical history, and oral lesions. The data recorded in the forms were entered into the software Stata version 18, where they were analyzed by logistic regression to examine the effects of age, gender, denture use, medication use, and smoking on oral lesions.

3. Results

The examinations were performed on 598 persons, of whom 253 (42.3%) were male and 345 (57.7%) were female. The mean age of the participants was 71.67 ± 10.28 years. The mean length of stay in the nursing home was 6.11 ± 4.27 years. Of all the participants, 101 persons (16.9%) were smoker and 248 persons (41.5%) were using dentures. The most common systemic disease among the participants was hypertension with a prevalence of 20.1% (Table 1). The overall prevalence of oral lesions among the participants was 52.5%. The most commonly observed lesions were xerostomia, sublingual varicosity, candidiasis, and white and red lesions, in that order (Table 2).

The elderly with hypertension had 1.743 times higher odds of having oral lesions than those without hypertension (Odds Ratio (OR) = 1.7; confidence interval = 1.15–2.63).

The multiple logistic regression model developed to examine the relationship of xerostomia with the studied variables showed the factors

Table 1
Prevalence of systemic diseases in the studied population (95% confidence interval).

		Count	Column N %	95.% Confidence Interval	
				Lower	Upper
Epilepsy	No	572	95.7%	0.029	0.063
	Yes	26	4.3%		
Alzheimer	No	578	96.7%	0.021	0.051
	Yes	20	3.3%		
CVA	No	576	96.3%	0.023	0.055
	Yes	22	3.7%		
Cardiovascular disease	No	590	98.7%	0.006	0.026
	Yes	8	1.3%		
Blood pressure	No	478	79.9%	0.169	0.235
	Yes	120	20.1%		
Diabetes	No	561	93.8%	0.044	0.084
	Yes	37	6.2%		
Depression	No	513	85.8%	0.115	0.173
	Yes	85	14.2%		

Table 2

Prevalence of all lesions and each individual lesion in the studied population (95% confidence interval).

		Count	Column N %	95.% Confidence Interval	
				Lower	Upper
Lesions	No	284	47.5%	0.484	0.566
	Yes	314	52.5%		
Xerostomia	No	373	62.4%	0.337	0.416
	Yes	225	37.6%		
Sublingual varicosities	No	444	74.2%	0.223	0.295
	Yes	154	25.8%		
Candidiasis	No	595	99.5%	0.001	0.015
	Yes	3	.5%		
White and red lesions	No	570	95.3%	0.031	0.067
	Yes	28	4.7%		

that increase the risk of xerostomia are gender (OR = 0.608; confidence interval = 0.431–0.856), Alzheimer's (OR = 2.98; confidence interval = 1.157–7.703), hypertension (OR = 1.77; confidence interval = 1.140–2.770), and diabetes (OR = 0.323; confidence interval = 0.135–0.770).

The elderly with Alzheimer's had 15.158 times higher odds of having candidiasis than those without Alzheimer's (OR = 15.158; confidence interval = 1.316–174.529).

4. Discussion

Epidemiological studies provide valuable information on the prevalence, spread, and severity of diseases.¹¹ The importance of epidemiological studies stems from the fact that diseases do not occur or spread equally across all populations and may be more prevalent in certain races, cultures, social-economic status, age groups, or gender.¹² This is also true for oral lesions. Oral lesions can be considered a reflection of general health.¹³ Given the malignancy potential and possible implications of oral lesions, knowledge of the prevalence and epidemiological characteristics of these lesions is of great importance for maintaining general health.¹⁴

The epidemiological characteristics of oral lesions have been the subject of many studies in different parts of the world including Iran, which have reported somewhat inconsistent results, probably because of epidemiological differences of studied populations.^{6,15,16} Considering these inconsistencies and the scarcity of epidemiological studies on oral lesions in the western parts of Iran, especially in the elderly Iranians, the present study measured the prevalence of oral lesions in the elderly residing in three nursing homes in Kermanshah, Iran. The prevalence of oral lesions in the studied population was 52.5%. Epidemiological studies conducted in different parts of the world have reported a wide range of prevalence rates from 4.1% to 52% for oral mucosal lesions.^{17,18} In a study by Espinosa et al.¹⁹, the prevalence of oral mucosal diseases among the elderly population of Santiago was reported to be 53%. In contrast, Taiwo et al.²⁰ reported that the prevalence of these lesions in the elderly was 29.9%.²⁰ The prevalence rate observed in our study (52%) is higher than the 44.9% rate reported by Rabiei⁹ for the elderly in the city of Rasht (in northern Iran) and also slightly higher than the 48.8% rate reported by Mozafari et al.⁸ for the elderly in the city of Mashhad (in northeastern Iran). However, it is much lower than the 77.6% prevalence rate reported by Motalebzadeh et al.¹⁵ for the elderly in Tehran. In general, oral lesions are more prevalent among the elderly than in young adults and the general population.^{21–23} This is because older age is associated with an increased incidence of oral lesions, malignant lesions, and pre-malignancies. Furthermore, many of the oral lesions are caused by medicines, dental prostheses, and systemic diseases; factors that are more frequent in older populations.²⁴

While examining the prevalence of oral lesions in different populations, it should be remembered that the prevalence of each specific

type of lesion can vary widely depending on the studied population. In the elderly studied in the present work, the most frequently observed oral condition was xerostomia (37.6%), followed by sublingual varicosity (25.8%), red and white lesions (4.7%) and candidiasis (0.5%). In a review study by Mumcu et al., it was reported that the most prevalent oral condition in the Spanish population is coated tongue, in American adults is chewing tobacco lesion, in Brazil is focal epithelial hyperplasia, in South Africa, Argentina, and Mexico is labial pits, and in Turkey is oral melanosis.¹¹ Delavarian et al. reported that the most common oral condition in a normal population in Mashhad, Iran, was coated tongue.¹² In a study by Fleishman et al., the most commonly observed condition was the vesiculobullous disease.²⁵ Tayebali et al. reported that the most common oral conditions in their population were pigmentation, white and red lesions, and exophytic lesions, in that order.²⁶ In a study by Saintrain et al., where red and white lesions were counted separately, the most common lesions were reported to be red lesions, ulcers, and white lesions, in that order.²⁷ These discrepancies in the reported prevalence rates can be attributed to differences in the studied populations, in sampling methods, and also how lesions are classified and counted because there is no clear definition for some lesions.¹⁸ Further, since older people consume more medications, the development of medication-related lesions can also affect the prevalence of some types of lesions. Some researchers have suggested that the type of diet consumed in nursing homes can also have a significant impact on the prevalence of oral lesions.⁹

Ferreira et al. (2010) did not find any significant relationship between age and oral lesions; a finding that is not consistent with our results.¹⁶ In contrast, Motalebzadeh et al. (2012) reported a significant relationship between age and oral lesions.¹⁵ Arbabi Kalati et al. (2010) reported a correlation between advanced age and mucosal pigmentation, fissured tongue, coated tongue, sublingual varicosity, denture-related lesions, angular cheilitis, vascular lesions, fibroma, ulcers, and reactive lesions.²⁸ Lin et al.²⁹ and Jainkittivong et al.²¹ have also reported the occurrence of oral lesions increases with age. Our results also showed a significant correlation between age and some specific types of lesions. In a study by Kovac-Kavcic et al., the prevalence of mucosal white lesions, denture-related lesions, fissured tongue, varicosity, and mucocele increased with age.³⁰ Castellanos et al. reported that the prevalence of some oral lesions depends on not only age but also gender.³¹ In the present study, xerostomia was 1.645 times more prevalent in men than in women, a difference that shows a significant relationship between gender and this specific oral condition. A study by Kleinman et al. reported a significant relationship between the overall incidence of oral lesions and gender.³² Although our results showed a significant relationship between gender and xerostomia, they did not show a significant relationship between gender and the overall incidence of oral lesions. Like the present study, other studies have reported that this relationship is only significant for some lesions. For example, Ikeda et al.³³ and Reichart et al.³⁴ found gender to be associated with the incidence of white lesions and Avuc et al.³⁵ found it to be associated with the incidence of coated tongue and papillary atrophy. Conversely, Mozafari et al.⁸ and Cobert et al.³⁶ found no significant relationship between gender and prevalence of oral lesions in the elderly. The studies of Delavarian et al.,¹² Pearson et al.,³⁷ and Jainkittivong et al.²¹ have also reported no significant relationship between gender and incidence of oral lesions.

The multiple logistic regression analysis conducted in the present study did not show any relationship between denture use and the prevalence of lesions. This is not consistent with the findings of Campisi et al.,³⁸ which reported a significant relationship between the prevalence of oral lesions and the use of dental prostheses. Concerning the effect of smoking, our results showed that smokers had 1.987 times higher incidence of sublingual varicosity than non-smokers, which means there is a significant relationship between smoking and this lesion in the elderly. The study conducted by Corbet et al. did not find a significant association between smoking and oral lesions.³⁶ However,

Motalebzadeh et al.,¹⁵ Mozafari et al.,⁸ and Mumcu et al.¹¹ have all reported there is indeed a significant relationship between smoking and oral lesions. Our evaluation of the association between systemic diseases and the prevalence of oral lesions in the participants showed that the elderly with hypertension were 1.743 times more likely to have oral lesions. These elderly were also 1.777 times more likely to have xerostomia and 1.616 times more likely to have sublingual varicosity. Holmlund et al.,³⁹ Maiborodin et al.,⁴⁰ and Kumar et al.⁴¹ have also identified hypertension as one of the major systemic factors influencing the incidence of oral lesions and manifestations. Frequency of oral mucosal lesions among the institutionalized elderly Lebanese population was 22.8%.⁴²

5. Conclusion

In this study, the prevalence of oral lesions in the elderly was 52.5%, which is a moderate rate compared to similar studies conducted in other areas. The oral condition that was most prevalent in the studied population was xerostomia and the least frequent was candidiasis. Data analysis showed a strong relationship between the prevalence of some oral lesions and hypertension and Alzheimer's. However, further studies are needed to check the association between demographic variables and systemic diseases and the prevalence of specific oral lesions. Also, future studies on the prevalence and risk factors of oral lesions are recommended to focus on specific lesions and also on specific age groups and non-selected populations in order to accurately measure the true prevalence of these lesions.

Author contribution

Neda Omidpanah: Design of the study and acquisition of data. Writing of the article.

Fateme Mohamadinejad: Collection of data.

Roya Safari faramani: Analysis and interpretation of data.

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