

Prevalence of oral mucosal lesions considering fertility status in women of Shahedieh cohort population

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Abstract

Background and objectives: A few large population-based studies have been conducted on the prevalence of oral mucosal lesions in relation to fertility status in the Iranian population. The aim of study was to determine the prevalence of oral mucosal lesions in relation to fertility status in women participants of Shahedieh cohort study.

Methods: A descriptive cross-sectional study was conducted on 4935 women who participated in the Shahedieh cohort study. The age range of participants was 35-71 years with a mean age of 47.12 years. The prevalence of oral mucosal lesions considering fertility variables including pregnancy, number of pregnancy, oophorectomy, tubectomy, hysterectomy, infertility, menopause, normal menopause, and abortion, application of infertility and oral contraceptive drugs and hormone replacement therapy were recorded.

Results: The total prevalence of oral mucosal lesions in the studied women were 3.8%. The most commonly affected age group was 40-49 years, followed by 30-39, 50-59 and 60-71 years, respectively. Considering the fertility variables, only menopause ($P=0.047$) and normal menopause ($P=0.024$) significantly related to the prevalence of oral mucosal lesions.

Conclusion: The findings of the present study provide information on the prevalence of the oral mucosal lesions considering fertility status in a large population-based study in Iran. With due attention to the higher prevalence of oral mucosal lesions in menopause women, an improved comprehension of oral manifestations at menopause and preventive and treatment approaches during this period should be programmed with health care services to meet the needs of patients deservingly.

Keywords: Epidemiology, Fertility, Menopause, Oral ulcer, Prevalence

Introduction

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Oral mucosal lesions occur with such symptoms as pain, malodor, problems in chewing and speaking, and may interfere with routine activities and psychological injuries. A lot of discovered etiological factors such as smoking and alcohol abuse, oral habits, bacteria, viruses, and fungi cause these lesions (1).

There is evidence that indicates differences in the oral health of people in addition to the difference in diet, which is associated with specific genes on chromosome x, so they are reflected in women of reproductive age. On the other hand, by identification of the receptors of sexual hormones on mucosal cells, the role of sex hormonal changes on oral tissue health has been considered (2).

In various stages of women life such as menstruation, pregnancy, and menopause, there are certain changes in the sex hormones' level of estrogen and progesterone, which affect various tissues, such as oral mucosal tissue, and may occur in various forms such as pyogenic granuloma gingivitis and burning mouth syndrome (3).

It is shown that oral mucosal lesions are one of the most common problems in pregnant women and lesions like pyogenic granuloma are detected in 10% of pregnant women (4).

The etiologic effect of sex hormones in the occurrence of this lesion and oral leukoplakia has been demonstrated, even though there are controversies about its mechanism (5). During menopause, the prevalence of oral lesions such as burning mouth syndrome, periodontitis and xerostomia increases (6).

Studies on the effects of alternative hormone treatments in menopausal women on oral

anomalies have shown improvement in oral symptoms (7), but still, there is a contradiction about the subject and also lack of evidence on the effectiveness of these hormones in the healing of oral injuries in post menopause period (8).

Based on the results of Andreasen and co-workers(9) meta-analysis on data from different countries a high prevalence of oral pathology (51.1%) were recorded. In contrast, in comparison to Asian regions such as Cambodia and Malaysia with the incidence of 4.9% (10) and 9.7% (11), the recorded percentage in Andreasen survey is much higher. Al-Mobeerikand and co-workers.(12) recorded 15% for the prevalence of oral mucosal lesions among Saudi dental patients with higher prevalence among females. Jahanbani and co-workers.(13) in a study on the prevalence of oral mucosal lesions in referred Iranian patients, recorded a total prevalence of 49.3% and high prevalence in men comparing women (62.4% Vs. 37.6%).

In general, there are a few studies on the prevalence of oral mucosal lesions considering the fertility status. The purpose of the present study was to investigate the prevalence of oral mucosal lesions considering fertility status in women of Shahedieh cohort study in 2018.

Materials and Methods

The present survey was a descriptive cross-sectional study which was conducted on data from Shahedieh cohort study, 2018, Yazd, Iran. The enrollment phase in Shahedieh started at April 2015 and finished at August 2016. The enrollment phase in Zarch & Ashkezar started at August 2016

and finished at September 2017. The present study analyzed the obtained data from cohort questionnaires. Oral lesion variable in the cohort questionnaires defined as any lesions or ulcers observed in the oral mucosa.

The sample consisted of 4935 women between 35 and 71 years old who participated in the Shahedieh cohort study (a center of PERSIAN cohort) in 2015-2017. The variables related to women in reproductive age such as a number of pregnancies, history of oophorectomy, tubectomy, hysterectomy, infertility, abortion, menopause, normal menopause, consuming OCPs, hormone replacement therapy, and infertility drugs were extracted by special cohort questionnaire. The incidence of lesions and ulcers in these individuals was also included in the checklist for this purpose.

This study was approved by the ethics committee of Shahid Sadoughi University of Medical Sciences, Yazd, Iran.

The data were analyzed using Statistical Package for the Social Sciences, version 22.0 (SPSS Inc, Chicago, Illinois, USA). Frequency distribution and percentage were used to describe descriptive data. Data were analyzed using chi-square statistical test. A significance level was set at $P < 0.05$.

Results

Totally, 4698 women with age range between 31 to 71 years and mean age of 47.1 (± 9.5) years were enrolled in the present study. The total prevalence of oral mucosal lesions among the population was 3.8% (180 women). According to age, the participants were categorized as four age groups: 30-39, 40-49, 50-59, and 60-71 yrs. The prevalence of oral soft tissue lesions increased from 30-

39 to 40-49 age group but decreased in the following age groups. Comparing the four age groups, there were no statistically significant differences (Table 1).

Considering the results of the present study, the prevalence of oral mucosal lesions were significant only in menopause ($p = 0.047$) and normal menopause ($p = 0.024$) women. Other fertility variables had no significant effect on the prevalence of oral mucosal lesions (Table 1).

Table 1: Prevalence of soft tissue oral lesions in the four age groups

Age groups Oral lesion	No	Yes	Total
30-39	1251(27.7%)	46(25.6%)	1297(27.6%)
40-49	1567(34.7%)	64(35.6%)	1631(34.7%)
50-59	1086(24%)	44(24.4%)	1130(24.1%)
60-71	614(13.6%)	26(14.4%)	640(13.6%)
Total	4518(100%)	180(100%)	4698(100%)

Also, consumption of infertility drugs, oral contraceptives, and drugs associated with hormone replacement therapy had no significant effects on the prevalence of oral mucosal lesions (Table 2).

Table2: Distribution of oral soft tissue lesions according to fertility variables.

Variables	Value	Women without oral soft tissue lesions	Women with oral soft tissue lesions	P value
Pregnancy	yes	68 (97.2)	2 (2.8)	0.85
	unknown	17 (94.5)	1 (5.5)	
Number of pregnancy	0	53 (96.4)	2 (3.6)	0.61
	1-2	787 (96.5)	29 (3.5)	
	3-4	1850 (95.8)	83 (4.2)	
	5-6	989 (96.9)	32 (3.1)	
	7+	841 (96.2)	34 (3.8)	
Oophorectomy history	unilateral	118 (96.8)	4 (3.2)	0.799
	bilateral	134 (97.2)	4 (2.8)	
Tubectomy history	yes	1091 (96.7)	38 (3.3)	0.375
Hysterectomy history	yes	348 (96.94)	11 (3.06)	0.56
Infertility	yes	672 (96.7)	23 (3.3)	0.52
Menopause	yes	2943 (96.6)	104 (3.4)	0.047
Normal menopause	yes	1176 (95.1)	61 (4.9)	0.024
Abortion	yes	1630 (95.8)	72 (4.2)	0.3
Infertility drugs	yes	461 (97.05)	14 (2.95)	0.37
Oral contraceptive	yes	2396 (96.1)	95 (3.9)	0.8
Hormone replacement therapy	Yes	845 (96.7)	28 (3.3)	0.369
	unknown	266 (95)	14 (5)	

Discussion

Based on the results of the present study, the total prevalence of oral mucosal lesions among the population was 3.8% and the prevalence of oral soft tissue lesions increased from 30-39 to 40-49 age groups but decreased in the following age groups. It seems that 40-49 age was concurrent with the onset of the menopause period in the population examined. The prevalence of oral mucosal lesions was significant only in menopause and normal menopause women. Also, the prevalence of oral mucosal lesions was not significant considering, consumption of infertility drugs, oral contraceptives, and drugs associated with hormone replacement therapy. Women have exceptional oral health consideration because hormone fluctuation during women's life makes them more susceptible to oral mucosal lesions (14). Patients with oral mucosal lesions could not eat and drink well and many aspects of their social relationship may be influenced. Oral discomfort is defined as a clinical condition with a broad range of manifestations from oral dryness to oral ulceration and gingival atrophy (15). Socioeconomic and behavioral factors are associated with the incidence and prevalence of oral mucosal lesions among populations.

Researches about the epidemiology, etiology and related risk factors of oral mucosal lesions, help the clinicians and policy makers in primary prevention, early diagnosis and treatment approach. Considering the high variety of oral mucosal lesions, estimation of the prevalence of oral mucosal lesions worldwide demonstrated a high heterogeneity ranging from 15% to 51%. Oral mucosa similar to vaginal mucosa is a pluristratified

epithelium with a desquamative growth pattern (16). The positive relationship between ovarian hormone changes and oral mucosa has been documented in various studies (17). Estrogens stimulate the proliferation of gingival fibroblasts, maturation of connective tissue and collagen turnover by blocking its degradation. Alterations in the oral mucosa in response to hormonal fluctuation occurred in microscopic and macroscopic dimension (15).

Considering the contradictory relation about the effect of estrogen and progesterone hormones on oral mucosa (18, 19), it can be concluded that changes in the level of steroid hormones affect only responsive patients who have the high-affinity estrogen receptors in the cellular community of oral cavity. Although, the indirect effects of sex hormones via other factors like growth factors should also be considered (20). The majority of studies about the prevalence of oral mucosal lesions derived from oral health services and limited population-based surveys exist in regard (16). The data obtained from the population-based studies are essential for comprehensive health planning programs.

There is a lack of studies about the prevalence of oral mucosal lesions in relation to fertility status in Iranian population. The aim of the present study was to evaluate the prevalence of oral mucosal lesions considering fertility status in women participants of Shahedieh cohort study.

The total prevalence of oral mucosal lesions in the present observational study was 3.8%. Andreasen and co-workers (9). in a meta-analysis on data from different countries recorded a high prevalence of oral pathology (51.1%). However, in comparison to Asian

regions such as Cambodia and Malaysia with the incidence of 4.9% (10) and 9.7% (11), the recorded percentage in Andreason survey is much higher. According to Al-Mobeeriekand and co-workers (12). study, the prevalence of oral mucosal lesions among Saudi dental patients was 15% with higher prevalence among females. High heterogeneity that is observed in the prevalence of oral mucosal lesions may be contributed to different factors such as methodological design and different geographic, biologic, cultural and social content in the studies (16).

Jahanbani and co-workers.(13) in a study on the prevalence of oral mucosal lesions in referred Iranian patients, recorded a total prevalence of 49.3% and high prevalence in men comparing women (62.4% Vs. 37.6%). In contrast, other studies recorded a high prevalence of oral mucosal lesions among females (12, 21).

The majority of prevalence studies used data from selected oral health services, where patients with oral complications have been referred to. This process leads to higher oral mucosal lesion prevalence recorded in comparison to population-based studies.

The results of the present study showed that there were no significant differences between four age groups considering the prevalence of oral mucosal lesions. The most commonly affected age was 60 to 69 years (4.0%). Other reports also indicated that oral mucosal lesions tend to increase with age (22, 23). Age is a consistent predictor for the incidence of oral mucosal lesions because the general vital capacity of a person impairs with aging (22, 23). Also, the higher frequency of systemic diseases and risk factors in elderly patients should be considered as a contributing factor

(24). Jahanbani and co-workers.(13) found that the relationship between age and prevalence of oral mucosal lesions was stronger in men than women.

During pregnancy, plasma levels of sex hormones change considerably which affects the oral mucosa and periodontal tissue. The mechanisms for the incidence of oral disorders in a pregnant woman is attributed to the changes in microcirculatory system and reaction to irritants (14).

The relationship between pregnancy, gingivitis, and periodontitis has been documented in the studies with limited samples (25). Based on the results of the present study, the prevalence of oral mucosal lesions among females of cohort population, with due attention to pregnancy and number of pregnancies was not significant.

Epidemiological studies about the prevalence of oral mucosal lesions mostly focused on the social and behavioral factors and there is lack of studies about the fertility status of the population (21, 22, and 24).

The results of the present study showed that, the prevalence of oral mucosal lesions was not significant in women with the history of oophorectomy, tubectomy, hysterectomy, infertility, and abortion. In contrast, in menopause and normal menopause participants the prevalence of oral mucosal lesions was significant

The relationship between menopause and oral mucosal lesions has been studied by a few researchers (18, 15, 24). Normal or natural menopause is defined as a permanent cessation of natural menstruation because the loss of ovarian follicular activity after 12 months of amenorrhea with no pathologic association is considered normal menopause

(6). However, radiation, surgery, and chemotherapy artificially induce menopause (26). Factors associated with the onset age of menopause consist of body mass index, family history, ethnicity, parity, menarche and previous consumption of oral contraceptive drugs (27).

Low estrogen level in the post-menopause stage affects the healthy balance between useful and harmful bacteria within the oral environment and also makes oral epithelial maturation difficult (6, 14). Although, there is conflicting data about the effect of menopause on oral mucosa, several well-controlled studies about oral discomfort during menopause have been conducted (10, 28). The high prevalence of oral discomfort reported in the above studies ranged from 23% to 43% (15, 28). The expression of estrogen receptor mRNA was down-regulated in postmenopausal than young women (19). On the other hand, a relationship between sex hormones and structural modifications like hyperplasia, hypertrophy, and atrophy in the oral mucosa and gingiva has been documented (29).

In the present study, a significantly higher prevalence of oral mucosal lesions other than oral discomfort has been recorded in menopause women. Widely distribution of steroid receptors in non-target tissues like gingival mucosa, buccal mucosa, and salivary gland tissue, make them estrogen-responsive. Thus, depending on the presence and number of these receptors in the oral cavity, oral manifestations and clinical features in the menopausal period vary considerably (20).

In the present survey, oral lesion prevalence was not significant with the consumption of

infertility drugs, OCPs and hormone replacement therapy (HRT)

OCPs that contain progesterone, up-regulate body response to toxins of bacteria in the plaque. Progesterone reduces the capillary flow rate, increases vascular permeability and accumulation of inflammatory cells. It has been shown that dry mouth, dry socket, and gingivitis are the most oral clinical features following OCPs consumption (14). The effect of HRT in ameliorating of oral symptoms is still controversial (6). Based on the results of Ree and co-workers (30) study, estrogen down-regulates its own receptor which could interfere with the impact of HRT on the prevalence of oral mucosal lesions and oral discomfort.

In the present study, oral mucosal lesions have not been specified and calibration of the examiners for the diagnosis of a range of oral mucosal lesions was difficult and challenging because the diagnosis process frequently requires histopathological analysis. Future cohort studies should be designed and programmed to identify and categorize oral lesions precisely.

It should be taken into consideration that prevalence figures change considerably between different geographic areas. Based on the referred groups of patients and cultural and social habits, the prevalence of the lesions varied considerably. Lack of oral health care during the hormonal fluctuation stage in a woman's life can have negative outcomes on their quality of life. Collaboration among all health care professional educators and providers could promote the quality of health care services along with meeting the oral health needs in these periods of women's lives.

Conclusion

The findings of the present study provide information on the prevalence of the oral mucosal lesions considering fertility status in a large population-based study in Iran. With due attention to the higher prevalence of oral mucosal lesions in menopause women ,an improved comprehension of oral manifestations at menopause and preventive and treatment approaches during this period should be programmed with health care services to meet the needs of patients deservingly.

Conflict of interest:

The authors declare that there is no conflict of interest.

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