A Population-Based Study to Evaluate the Prevalence of Oral Mucosal Lesions in Pregnant Women

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ABSTRACT

Background: Pregnancy is associated with profound hormonal and immunological changes that predispose women to a variety of oral mucosal lesions. These lesions may affect maternal comfort, nutrition, and overall oral health. The present study was conducted to evaluate the prevalence and pattern of oral mucosal lesions among pregnant women.

Materials and Methods: A population-based cross-sectional study was conducted among 500 pregnant women attending antenatal clinics in urban and rural areas. Oral examination was performed using WHO criteria by trained dental professionals. Demographic data, trimester of pregnancy, oral hygiene practices, and oral mucosal lesions were recorded. Data were analyzed using SPSS version 26.0. Descriptive statistics and Chi-square test were applied, with $p<0.05$ considered statistically significant.

Results: Among the 500 pregnant women examined, 142 (28.4%) presented with at least one oral mucosal lesion. Pregnancy gingivitis (12.8%) was the most common lesion, followed by aphthous ulcers (5.8%), traumatic ulcers (3.8%), pyogenic granuloma (2.8%), candidiasis (2.2%), oral pigmentation (0.8%), and other lesions (0.2%). Oral mucosal lesions were significantly more common during the third trimester ($p=0.021$) and among women with poor oral hygiene ($p=0.004$).

Conclusion: Oral mucosal lesions are relatively common during pregnancy, particularly during the third trimester. Routine antenatal oral screening and preventive oral healthcare should be incorporated into maternal healthcare programs.

Keywords: Pregnancy, Oral mucosal lesions, Prevalence, Oral health, Antenatal care.

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Introduction

Pregnancy is a unique physiological condition characterized by marked hormonal, vascular, and immunological changes that influence multiple organ systems, including the oral cavity. Elevated levels of estrogen and progesterone alter the oral environment and increase susceptibility to inflammatory and infectious conditions. Consequently, pregnant women frequently experience oral mucosal changes that may adversely affect their quality of life and nutritional intake.[1, 2] Oral mucosal lesions during pregnancy encompass a wide spectrum of conditions, including pregnancy gingivitis, pyogenic granuloma, aphthous ulcers, candidiasis, traumatic ulcers, and physiological pigmentation. Although many of these lesions are benign and self-limiting, some may require prompt diagnosis and management to prevent discomfort and secondary complications.[3]

Several factors contribute to the development of oral mucosal lesions during pregnancy, including poor oral hygiene, nutritional deficiencies, hormonal fluctuations, systemic diseases, and altered immune responses. Inadequate awareness regarding oral healthcare during pregnancy often delays treatment, thereby increasing the burden of oral disease among expectant mothers.[4, 5] Previous epidemiological studies have reported considerable variation in the prevalence of oral mucosal lesions among pregnant women, ranging from 15% to 40%, depending on the study population and diagnostic criteria employed. Despite growing recognition of maternal oral health, population-based data from developing countries remain limited.[6, 7] The present population-based study was therefore undertaken to evaluate the prevalence, distribution, and associated demographic characteristics of oral mucosal lesions among pregnant women. The findings are expected to assist healthcare professionals in developing

preventive strategies and integrating oral health assessment into routine antenatal care.

Materials and Methods

This population-based cross-sectional study was conducted among 500 pregnant women attending antenatal clinics. Ethical approval was obtained from the Institutional Ethics Committee, and written informed consent was obtained from all participants before enrolment. Pregnant women aged 18 years and above who consented to participate were included in the study. Women with severe systemic illnesses, immunocompromised conditions, or those receiving medications known to induce oral lesions were excluded. Information regarding age, trimester of pregnancy, educational status, residence, and oral hygiene practices was collected using a structured questionnaire. Comprehensive oral examination was performed by calibrated dental professionals under adequate illumination using sterile mouth mirrors and WHO periodontal probes. Oral mucosal lesions were diagnosed according to WHO diagnostic criteria. Data were entered into Microsoft Excel and analyzed using SPSS version 26.0. Descriptive statistics were expressed as frequency and percentage, while associations between variables were evaluated using the Chi-square test. A p-value <0.05 was considered statistically significant.

Results

The largest proportion of participants belonged to the 25–30 years age group (212; 42.4%), followed by those aged <25 years (184; 36.8%), while 104 (20.8%) were aged >30 years. Most participants were in the third trimester of pregnancy (198; 39.6%), followed by the second trimester (184; 36.8%) and first trimester (118; 23.6%). A higher proportion of women resided in urban areas (284; 56.8%) than in rural areas (216; 43.2%). Regarding educational status, secondary education was the most common level attained (204; 40.8%), followed by graduation (168; 33.6%), primary education (88; 17.6%), and postgraduate education (40; 8.0%). Overall, 142 (28.4%) pregnant women presented with one or more oral mucosal lesions, whereas 358 (71.6%) had no detectable lesions. Pregnancy gingivitis was the most prevalent lesion, affecting 64 (12.8%) participants, followed by aphthous ulcers in 29 (5.8%), traumatic ulcers in 19 (3.8%), pyogenic granuloma in 14 (2.8%), and oral candidiasis in 11 (2.2%) participants. Oral pigmentation and other lesions were relatively uncommon, occurring in 4 (0.8%) and 1 (0.2%) participant, respectively. The prevalence of oral mucosal lesions increased progressively with advancing gestational age, from 18.6% in the first trimester to 26.1% in the second trimester and 36.4% in the third trimester. Conversely, the proportion of women without oral mucosal lesions decreased across the trimesters. The association between trimester and the presence of oral mucosal lesions was found to be statistically significant (p=0.021), indicating that oral mucosal lesions were more frequently observed during the later stages of pregnancy

Table 1. Sociodemographic Characteristics of the Study Participants (N=500)

Variable	Category	n (%)
Age (years)	<25	184 (36.8)
	25–30	212 (42.4)
	>30	104 (20.8)
Trimester	First	118 (23.6)
	Second	184 (36.8)
	Third	198 (39.6)
Residence	Urban	284 (56.8)
	Rural	216 (43.2)
Education	Primary	88 (17.6)
	Secondary	204 (40.8)
	Graduate	168 (33.6)
	Postgraduate	40 (8.0)

Table 2. Distribution of Oral Mucosal Lesions Among Pregnant Women (N=500)

Oral Mucosal Lesion	n	%
Pregnancy gingivitis	64	12.8
Aphthous ulcer	29	5.8
Traumatic ulcer	19	3.8
Pyogenic granuloma	14	2.8
Oral candidiasis	11	2.2
Oral pigmentation	4	0.8
Other lesions	1	0.2
No lesion	358	71.6

Table 3. Association Between Trimester and Presence of Oral Mucosal Lesions

Trimester	Lesion Present n (%)	No Lesion n (%)	Total	p-value
First	22 (18.6)	96 (81.4)	118	0.021 (Significant)
Second	48 (26.1)	136 (73.9)	184	
Third	72 (36.4)	126 (63.6)	198	
Total	142 (28.4)	358 (71.6)	500	

Discussion

Pregnancy is associated with significant hormonal, immunological, and vascular changes that can influence the health of the oral cavity. These

physiological alterations increase the susceptibility to various oral mucosal lesions, including pregnancy gingivitis, aphthous ulcers, candidiasis, and pyogenic granuloma. Although most of these lesions are benign, they may cause pain, discomfort, and adversely affect nutrition and quality of life. Early identification and appropriate management of oral mucosal lesions are essential for maintaining maternal oral and overall health. However, population-based data on the prevalence of oral mucosal lesions among pregnant women remain limited.[8- 11] Therefore, the present study was undertaken to evaluate the prevalence and pattern of oral mucosal lesions among pregnant women.

Among the 500 pregnant women, the majority were aged 25–30 years (42.4%), were in the third trimester (39.6%), resided in urban areas (56.8%), and had secondary education (40.8%). Overall, 142 (28.4%) participants had oral mucosal lesions, while 358 (71.6%) showed no lesions. Pregnancy gingivitis was the most common lesion (12.8%), followed by aphthous ulcers (5.8%), traumatic ulcers (3.8%), pyogenic granuloma (2.8%), and oral candidiasis (2.2%). The prevalence of oral mucosal lesions increased significantly with advancing pregnancy, from 18.6% in the first trimester to 36.4% in the third trimester (p=0.021). Bett JVS et al assessed the prevalence of oral mucosal disorders during pregnancy. Fifteen studies met the eligibility criteria and were selected for qualitative synthesis and meta-analysis, of which 5935 participants were enrolled. The overall prevalence of oral mucosal disorders was 11.8%. Gingival hyperplasia (17.1%), morsicatio buccarum (10%), oral candidiasis (4.4%), pyogenic granuloma (3%), and benign migratory glossitis (2.8%) were the most prevalent lesions. The overall risk of bias was considered moderate, and the quality of evidence was very low. Disorders of the oral mucosa were present in approximately 1 out of 10 pregnant women. Gingival hyperplasia was the most prevalent lesion.[12] Jain K et al assessed the prevalence of oral lesions during different trimesters of pregnancy and their correlation with salivary pH change. The gingival, simplified oral hygiene, community periodontal and decayed-missing-filled teeth indices were used to assess a total of 120 pregnant women (40 in each trimester group) and 40 nonpregnant women (control group). Scores for all indices increased while salivary pH decreased from the control group to the first trimester group, through to the third. Oral lesions were seen in 44.2% of pregnant women. Lesions were seen in 27.5%, 52.5% and 52.5% of women in the first, second and third trimesters, respectively. The percentage of pregnant women with one oral lesion was highest in the second trimester (47.5%), whereas the third trimester had the highest prevalence (17.5%) of two concurrent oral lesions. The incidence of fissured tongue was highest in the first trimester group, and that of gingival enlargement was highest in the third trimester group. In the second trimester group, there was an almost equal incidence of fissured tongue and gingival/mucosal enlargement.[13] Ghanem, N.H et al, in another study, assessed prevalence of oral lesions among pregnancy subjects. Several oral findings, including gingivitis, soft-tissue swellings, candidiasis, and dental erosion, were observed more frequently among pregnant participants compared with controls. Salivary cortisol levels were higher in pregnant groups, with the highest levels observed in the first trimester. Salivary cortisol level was found to be higher in the study groups than the control group, with the first trimester being the highest of all groups. Significant associations were identified between oral hygiene and caries incidence, vomiting history and certain oral mucosal changes, salivary cortisol levels and soft-tissue lesions, and TPDS scores and soft-tissue changes. These findings represent associations rather than causal relationships.[14]

Conclusion

Oral mucosal lesions are common among pregnant women, with pregnancy gingivitis being the predominant lesion. Incorporating routine oral examinations and oral health education into antenatal care may facilitate early diagnosis and improve maternal oral health outcomes.

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