

DENTAL CARIES AND GINGIVITIS AMONGST PREGNANT WOMEN: A SAMPLE FROM URBAN AND RURAL AREAS OF KARACHI

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ABSTRACT

Pregnancy is a special state which is related to emotional and physiological changes of different parts of the body including oral cavity. Gingival and periodontal changes during pregnancy have been well-documented. Hormonal changes due to fluctuations in levels of estrogen and progesterone in the body during pregnancy make the woman more susceptible to oral infections and gum diseases and these dental problems not only affect expectant mothers but also the developing baby.

*A cluster sampling technique was used and 200 pregnant women attending department of obstetrics and gynecology, Baqai Hospital, Nazimabad and Fatima Hospital, Baqai Medical University were recruited. The age of the women ranged from 18 to 35 years. The sample size was calculated by taking 85% prevalence rate and computed using Open Epi (version 3.01) at 95% confidence interval and $\alpha=5\%$. Data were entered and analyzed by IBM SPSS version 22. Mean and standard deviation were assessed and independent *t* test was done to find out the mean DMFT amongst urban and rural areas. Chi square test was done to compare the frequencies between two groups.*

The burden of dental caries amongst rural and urban pregnant women was reported high with a rural prevalence of 56.7% and 43.3% of urban pregnant women. 71.4% of urban pregnant women reported with bleeding gums and 28.6% of rural pregnant women.

The present study concluded that dental caries was prevalent in rural locality and gingivitis in urban locality.

Key Words: Dental caries, gingivitis, pregnant women, rural and urban areas.

INTRODUCTION

Pregnancy is a special state which is associated with emotional and physiological changes in different parts of body including oral cavity.¹ Research has shown that majority of the pregnant women do not undergo dental treatment during the prenatal period and therefore there is a high incidence of dental caries reported.² Hormonal changes due to fluctuations in levels of estrogen and progesterone in the body during pregnancy make the woman more susceptible to oral infections

and gum diseases and these dental problems not only affect expectant mothers but also the developing baby.^{3,4}

Dental caries is an infectious disease which is related to the interaction between biological, behavioural and socioeconomic influences.⁵ It has been reported that pregnancy could increase the risk of caries initiation or progression, by changes in saliva composition⁶, repeated gastric reflux or less effective oral health care.⁷ However, due to the relatively short time frame of pregnancy and the kinetics of dental caries progression,⁸ it is unlikely that dental caries will develop initially to extensive tooth loss within this period. Dental caries often leads to painful and stressful situations with negative effects on the quality of life of pregnant women.⁹ De Oliveira et al in a study reported a frequency of 39% of oral pain during pregnancy, predominantly caused by dental problems.⁹ Recent studies conducted on a relatively small populations in Pakistan, Brazil and Hungary to assess the frequency of dental caries during pregnancy reported values between 47% and 69%.⁹⁻¹¹

Periodontal disease includes gingivitis, an inflammation of the gingiva, and periodontitis, inflammation along with the breakdown of supporting periodontal tissues¹² that may elevate the risk of serious health problems for child bearing women.^{13,14} Gingivitis with

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bleeding gums is the most common dental problem encountered and contributes around 60-70% of pregnant women.¹⁵⁻¹⁶ Published studies reported that the prevalence rate of pregnancy gingivitis ranges between 30 and 100%.¹⁵⁻¹⁸ Reports from the Health Care Centers of Bangkok, Nakornsawan and Yala showed that the prevalence of gingivitis in pregnant women was 98.0%, 86.3% and 98.8%, respectively. The prevalence rate of pregnant women required dental treatment for dental caries and gingivitis were 86.0%, 97.0%, and 94.8%, respectively.⁷ The aim of this study was to determine the frequency of dental caries and gingivitis and the number of decayed teeth in a small sample of pregnant women and also evaluate socio-demographic and other variables relative to oral health status.

METHODOLOGY

A descriptive cross sectional study was conducted from August 2016 to April 2017 to assess frequency of dental caries and gingivitis amongst pregnant women of urban and rural population of Karachi Pakistan. A cluster sampling technique was used and 200 pregnant women attending department of obstetrics and gynecology, Baqai hospital Nazimabad and Fatima hospital Baqai Medical University were recruited. The age of the women ranged from 18 to 35 years. The sample size was calculated by taking 85% prevalence rate and computed using Open Epi (version 3.01) at 95% confidence interval and $\alpha=5\%$.

Informed consent was obtained from all the participants and ethical clearance was obtained from the ethical committee, Baqai Medical University. Demographic information was obtained which included age, residence, occupation and education. All the participants were examined by two trained examiners using mouth mirrors and probes. Dental caries was recorded using DMFT index according to WHO dentition status. Gingival status was examined using Basic Periodontal examination of British society of periodontology using WHO probe. A p-value of <0.05 was considered statistically significant. Data were entered and analyzed by IBM SPSS version 22. Mean and standard deviation were assessed and independent t test was done to find out the mean DMFT amongst urban and rural areas. Chi square test was done to compare the frequencies between two groups.

RESULTS

Pregnant women of rural areas were found to have more dental caries 56.7% when compared to pregnant women of urban locality 43.3%. The mean DMFT was 0.87 ± 0.630 for rural areas and 0.68 ± 0.665 for urban areas. Table 1 71.4% of urban pregnant women reported with bleeding gums and 28.6% of rural pregnant women. Table 2 Frequency of calculus was reported 68.7% for rural pregnant women and

33.3% for urban pregnant women. Another significant finding was the presence of 60.0% of shallow periodontal pockets for rural women but 40.0% for urban women. Fig 1

TABLE 1: FREQUENCY OF DENTAL CARIES IN URBAN AND RURAL AREAS

Variable	Location		P-value
	Rural (n=100)	Urban (n=100)	
Dental caries	68(56.7%)	52(43.3%)	0.079
DMFT			
Mean	0.87 ± 0.630	0.68 ± 0.665	0.039
D(±SD)	2.53 ± 2.35	1.46 ± 1.732	0.000
M(±SD)	0.81 ± 1.080	0.29 ± 0.656	0.000
F(±SD)	0.18 ± 0.435	0.24 ± 0.605	0.422

TABLE 2: FREQUENCY OF PERIODONTAL DISEASES IN URBAN AND RURAL AREAS

Variable	Location		P value
	Rural (n= 100)	Urban (n=100)	
BPE			
Mean	1.58 ± 0.831	1.14 ± 0.841	0.000
Healthy	16 (39.0%)	25(61.0%)	
Bleeding on probing	16(28.6%)	40(71.4%)	
Calculus	62(68.7%)	31(33.3%)	
Probing depth 3.5mm & 5.5mm	6(60.0%)	4(40.0%)	0.000
Probing depth >5.5 mm	0	0	
Furcation involvement	0	0	

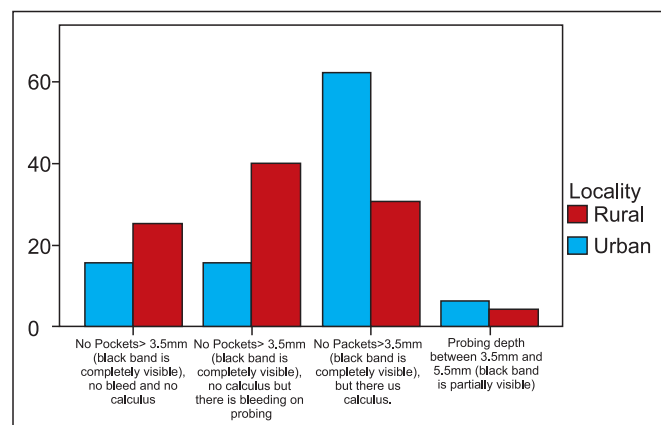


Fig 1: Basic Periodontal Examination

DISCUSSION

The physiological changes that occurs during pregnancy might result in noticeable changes in the oral cavity.^{7,19,20} These changes predispose women to pregnancy gingivitis, benign gingival lesions, tooth mobility, tooth erosion, dental caries and periodontitis.²¹

The results of the present study reported that pregnant women of rural locality reported with more dental caries whereas pregnant women from urban locality reported with the presence of more gingivitis. Dental caries is an infectious disease that is caused by bacteria colonizing the tooth surfaces but²² the predominant bacteria attributed to dental caries is not present in new born babies. Dental caries if left untreated in pregnant women it would result in high salivary levels of *S. mutans* that could be transmitted to the baby. Therefore, treatment of dental caries and reducing the salivary levels of *S. mutans* is important to reduce the incidence of dental caries among the babies.²² Negative perceptions amongst rural women regarding dental treatment during pregnancy contributed to the lower cost of dental services utilization and high prevalence of untreated dental caries.²¹ Cultural beliefs associated with dental treatment also contribute to the complexity of the problem which included a belief that brushing of teeth causes bleeding of gums or undergoing extraction of an upper molar causes loss of vision.²³ Fear of dental treatment whether resulted from prevailing community beliefs or personal negative dental experiences, might cause these women to defer dental treatment.²³ The major barrier in seeking dental treatment is absence of affordable dental treatment since there is a limited access to dental public health services and the cost of private dental treatment is very high.²³ Furthermore preventive dental examination and treatment is not given as much weightage by both dental professionals and policymakers in rural areas.²⁴

The present study reported that 68(56.7%) of rural women and 52(43.3%) of urban women suffered from dental caries. Mital P et al²⁶ in his study reported that 108 (61.3%) of rural women and 55(38.7%) of urban women likely to suffer from dental caries. Karunachandra et al²⁵ reported that 421 (91.7%) of rural women and 286 (82.2%) of urban women suffered from dental caries. Kapur R et al²⁶ reported that 175 (73.5%) of rural women and 63(26.5%) of urban women have dental caries.

Women are more likely to develop gingivitis during pregnancy which affects up to 70% of pregnant women.²⁷ Gingival changes occurred during pregnancy due to increase in the estrogen metabolism by the gingiva and synthesis of prostaglandins.²⁷ Alterations in progesterone and estrogen levels have been shown to affect the immune system and both the rate and patterns of collagen production in the gingiva. Both of

these conditions reduce the body's ability to repair and maintain gingival tissues.^{28,29} Mital P et al²¹ reported that 117 (66.1%) of rural women and 60 (33.9%) of urban women have gingivitis. Karunachandra et al²⁵ reported that 270 (58.8%) of rural women and 6 (1.7%) of urban women have gingivitis. Ritu G et al³⁰ reported that prevalence of periodontal diseases was 95% amongst pregnant women. Similar results were reported by and Tonello et al³¹ in Lucas do Verde, MT, Brazil (83.0%) The present study reported that 16 (28.6%) of rural pregnant women and 40 (71.4%) of urban women were having gingivitis. Karunachandra N et al²⁵ reported that urban women had a higher prevalence of 4-5 mm of the periodontal pockets. Alternatively more urban women may have had scaling which could have facilitated a more accurate assessment of probing pocket depths.³¹ The present study reported that 6 (60%) of rural women and 4 (40%) of urban women were found to have periodontal pockets.

LIMITATIONS

The main limitation of the study was that the sample size was small and was taken from two hospital settings. Future studies are therefore recommended on larger scale.

CONCLUSION

The present study concluded that dental caries was prevalent in study subjects from rural localities and gingivitis from urban areas subjects. There is a need to arrange access to public health services and private dental treatment should be cost effective for pregnant women who belonged to poor socioeconomic status.

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CONTRIBUTIONS BY AUTHORS

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| 1 Talha M Siddiqui: | Overall supervision. |
| 2 Saadia Akram: | Questionnaire development & data collection. |
| 3 Aisa Wali: | Write up and statistical analysis. |
| 4 Pashmeena Mahmood: | Questionnaire development & data collection. |
| 5 Samara Rais: | Questionnaire development & data collection. |