

# ORAL HEALTH STATUS DURING PREGNANCY IN NORTH INDIAN WOMEN

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## ABSTRACT

**Introduction:** India is a developing country and 70% of its population lives in rural areas. A well-organized maternal and child health program under National Rural Health Mission (NRHM) has been incorporated. The aim of this study was to report the oral disease burden of rural and urban antenatal women, thus highlighting the need to provide oral health care to this group.

**Materials & Methods:** The sample consisted of 549 rural and 438 urban pregnant women in their third trimester. Data were collected using interviewer administered questionnaires and a clinical oral examination conducted by calibrated examiners.

**Results:** The mean Decayed Missing and Filled Teeth (DMFT) among rural antenatal women were  $5.23 \pm 3.13$ , with  $2.39 (\pm 2.19)$  decayed teeth,  $1.37 (\pm 1.85)$  missing teeth, and  $1.89 (\pm 1.90)$  filled teeth. Among urban antenatal women, the mean DMFT was  $3.57 (\pm 3.75)$  with  $1.07 (\pm 2.12)$  decayed teeth,  $1.03 (\pm 1.63)$  missing teeth and  $1.09 (\pm 2.56)$  filled teeth. Almost 60% of rural women presented with bleeding gums. Similarly, the prevalence of calculus was 33.4% for rural women and 12% for urban women.

**Conclusion:** Antenatal women in India have a high burden of dental caries and periodontal disease. This study indicated that the rural women had as twice as many untreated dental caries compared with urban women, but were unlikely to use oral healthcare services due to concerns about safety in receiving dental care during pregnancy. Oral health education should be included as an integral part of antenatal care to increase the women awareness. This would improve the mothers' dental care-seeking behavior.

**Key words:** Antenatal women, Dental caries, Periodontal disease.

## INTRODUCTION

India is a developing country with a well-established public health infrastructure. Of the 1,210,193,422 residents reported in the 2011 provisional census report, <sup>[1]</sup> approximately 70% live in rural areas. <sup>[2]</sup> A well-organized maternal and child health

program under NRHM started in 2005 has significant gains in reducing both maternal and infant mortality rates. <sup>[3]</sup> The program consists of maternal health, child health, women's health and family planning. Pregnant women are eligible to receive antenatal care free of charge in the public health system, irrespective of their

socioeconomic status and geographic location.

Pregnancy is a special state for a woman, which is associated with a myriad of emotional and physiological changes in different parts of body including oral cavity and dental health.<sup>[4]</sup> These changes predispose women to dental caries and periodontal diseases.<sup>[5]</sup> Oral tissues are known to be affected by pregnancy with the most frequent and greatest changes occurring in the gingival tissue.<sup>[6]</sup> Pregnant women may be more susceptible to periodontal disease since higher concentrations of oestrogen and progesterone can induce hyperaemia, oedema and bleeding in periodontal tissues,<sup>[7]</sup> increasing the risk of bacterial infections. Periodontal disease is both preventable and treatable. Controlling plaque by brushing, flossing and professional prophylaxis, including scaling and root planing, will help in achieving good dental health in pregnancy.<sup>[8]</sup>

In recent times, the oral health of pregnant women has been gaining more interest because of the suspected association between periodontal diseases and adverse pregnancy outcomes such as premature birth, low birth weight and pre-eclampsia.<sup>[9-11]</sup> The provision of routine antenatal care is aimed at ensuring general maternal well-being and the subsequent delivery of healthy babies. However, while oral health is now accepted as an important component of general well-being of pregnant women in developed countries it remains an underrated component in developing countries such as India. Prevention of oral and dental problems and their complications during pregnancy is possible through having pregnant women

expressing appropriate knowledge, attitude and practice.

The objective of this study was to report the oral disease burden of rural and urban antenatal women, and to assess women's knowledge and attitude towards oral and dental health during pregnancy thus highlighting the need to provide oral health care to this group.

## MATERIALS AND METHODS

The study was carried out among pregnant women belonging to rural and urban settings residing in Moradabad district of Uttarpradesh, Northan India. The rural setting included 549 pregnant women (in their 3<sup>rd</sup> trimester); whereas urban settings included 438 pregnant women (in their 3<sup>rd</sup> trimester) in the same province. Written, informed consent was obtained from the selected participants. Participants with systemic diseases were excluded from the study. The study was conducted in accordance with the ethical guidelines for human experiments as laid down in the Helsinki Declaration.<sup>[12]</sup>

All participants were examined for Decayed, Missing, filled teeth (DMFT) index for dental caries experience and Community Periodontal Index of Treatment Needs (CPITN) for periodontal status assessment.

The data were collected using an interviewer-administered. The questionnaire included socio-demographic information, utilization of dental services and perception of the safety of receiving dental treatment during pregnancy, administered as a sub-question of perceived need for receiving dental care. Those who responded 'no' to the latter

were then asked about their perception of the safety of receiving dental care during pregnancy, recorded as 'safe' or 'unsafe'. For the urban sample a minor modification was made to the questionnaire regarding the perception of receiving dental care during pregnancy. This was assessed as a separate question worded 'Is it safe to receive dental care during pregnancy?' (response 'Yes' or 'No').

Statistical analyses were conducted using SPSS v13.0. Chi-square test of statistical significance was used to compare the frequencies between the two groups.

## RESULTS

The mean age of the rural and urban of antenatal women was  $26 \pm 4.6$  years and  $29 \pm 4.3$  years, respectively ( $p=0.001$ ). The ages ranged from 18 to 45 years for rural women and 18 to 41 years for urban groups. Among both groups, the majority of pregnant women were housewives 71.3% (urban) and 74.3% (rural), respectively. The majority of rural and urban participants were either expecting their first or the second baby: 82.7% and 87.4% respectively; and rural and urban utilization of dental services within past 12 months was 39% and 63%, respectively. In all, 33% of rural antenatal women were not willing to receive dental care, irrespective of having oral health problems. All these differences were statistically significant ( $p<0.05$ ) [Table 1].

The burden of dental caries among rural and urban antenatal women was high with a rural prevalence of 92.3%, and 79.2% for urban women. However, rural women had a significantly higher prevalence of dental caries than urban women ( $p=0.001$ ). On average the rural women had as twice as

many untreated dental caries compared with their urban counterparts ( $p=0.001$ ). Rural women did not differ significantly from urban women in the number of missing teeth despite having a slightly higher score ( $p=0.155$ ) [Table 2].

The prevalence of healthy periodontium was as low at 7% for both groups of women. Almost 60% of rural women presented with bleeding gums, while this was only so for 2.3% of the urban women. The prevalence of shallow periodontal pockets (4-5 mm) was 3.5% for rural women but 73.0% for urban pregnant women ( $p<0.0001$ ) [Table 2].

## DISCUSSION

The study revealed that the antenatal women in India carried a high burden of oral disease with regard to dental caries and periodontal disease. Location (urban v/s rural) was another significant predictor for caries experience. Furthermore, urban women were significantly more likely to use dental care services within the preceding 12 months.

Similar studies conducted in developed countries such as the USA have revealed that most women do not access oral health care during pregnancy despite evidence that poor oral health can have an adverse impact on the health of the pregnant woman and her baby. [13] A recent study reported low utilization of dental care services by Malaysian antenatal women but that those who were aware of the association between poor maternal oral health and adverse pregnancy outcomes were more likely to use those services. [14]

The rural women's negative perceptions of receiving dental treatment during

pregnancy may have contributed to their lower rates of dental services utilization in the preceding 12 months and higher prevalence of untreated dental caries. Differences in the availability and accessibility of dental care services in urban and rural locales could also have been influential. That urban women had a higher prevalence of 4-5 mm periodontal pockets despite higher access to dental care may be attributable to the hormonal changes at their stage of pregnancy increasing sensitivity to periodontal disease.<sup>[15]</sup>

Alternatively, more urban women may have had scaling (professional removal calculus above and below gingivae), which could have facilitated a more accurate assessment of probing pocket depths. Moreover, the main clinical parameter accounted for in periodontal diagnosis by the CPITN index is probing pocket depths, and this may have given rise to an overestimation of prevalence measures;<sup>[16]</sup> however, a recent study reported underestimation of prevalence measures using the CPITN index.<sup>[17]</sup> Therefore, the periodontal status findings of both groups could have been influenced by inherent measurement issues. Not surprisingly, older pregnant women have a higher need for oral health care than their younger counterparts.

## CONCLUSIONS

Pregnancy is an important milestone in a women's life and it indicates an increased need for dental care, among other health needs. Antenatal women in India have a high burden of dental caries and periodontal disease. This study indicated that rural women had as twice as many untreated dental caries compared with

urban women, but were unlikely to use oral healthcare services due to concerns about safety in receiving dental care during pregnancy. Lack of dental visits during pregnancy may be attributed to lack of oral health care information and counseling in the antenatal health care centers. Oral health education should be included as an integral part of antenatal care to increase the women awareness. This would improve the mothers' dental care-seeking behavior.

Therefore, oral health care services should be made more accessible and acceptable to all rural and urban pregnant women in India through the national program.

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## TABLES:

Table 1: Distribution of rural and urban antenatal women by socio-demographic attributes, utilization of dental services and misconceptions about receiving dental treatment during pregnancy.

ATTRIBUTE	LOCATION		P-VALUE*
	RURAL (N=549)	URBAN (N=438)	
Age in years ( $\pm$ SD); range	26.12( $\pm$ 4.64);18-45	29.13( $\pm$ 4.39);18-41	0.001*
Children – n (%)			
≤ 2	454 (82.7)	382 (87.4)	0.001
Occupation – n (%)			
Unemployed	391 (71.3)	325 (74.3)	0.001
Utilization of dental services <sup>#</sup>			
Yes - n (%)	218 (39.8)	277 (63.3)	0.001
Perception of received dental care during pregnancy			
Not safe – n(%)	95 (52.7) <sup>##</sup>	146 (33.4)	0.001

(<sup>#</sup>)- within preceding 12 months; (<sup>##</sup>)- among 181 rural mothers who were not willing to receive dental care.(\*)-  $\chi^2$  test to compare proportions used for all categorical variables; (\*\*)- t-test to compare means of independent samples.

Table 2: Burden of oral disease among urban and rural antenatal women.

VARIABLE	LOCATION		P-VALUE*
	RURAL (N=549)	URBAN (N=438)	
Dental caries prevalence			
Has caries (DMFT $\geq$ 1)	506 (92.3)	346 (79.2)	0.001
DMFT			
Mean ( $\pm$ SD)	5.23 ( $\pm$ 3.13)	3.57 ( $\pm$ 3.75)	0.001
D ( $\pm$ SD)	2.39 ( $\pm$ 2.19)	1.07 ( $\pm$ 2.12)	0.001
M ( $\pm$ SD)	1.37 ( $\pm$ 1.85)	1.03 ( $\pm$ 1.63)	0.155
F ( $\pm$ SD)	1.89 ( $\pm$ 1.90)	1.09 ( $\pm$ 2.56)	0.026
Range score	0.17	0.27	
Periodontal disease- n (%)			
Healthy	387(6.9)	33 (7.67)	0.0001
Bleeding	327 (59.6)	10 (2.3)	
Calculus	183 (33.4)	52 (12.1)	
4-5mm pockets	22 (4.1)	308 (70.5)	
>6mm pockets	6.5 (1.2)	14 (3.3)	

D- decayed teeth; M- missing teeth; F-filled teeth. DMFT- index denotes sum of decayed, missing and filled teeth; SD- standard deviation; (\*)- Chi-square test used, other p-values are based on t-test for comparing means of independent samples.