Research Article

ASSESSMENT OF ORAL HEALTH STATUS AND TREATMENT NEEDS AMONG PREGNANT WOMEN OF PUNE CITY - A HOSPITAL BASED CROSS-SECTIONAL ANALYTICAL STUDY

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ABSTRACT

Background- Pregnancy is a dynamic physiological state evidenced by several transient changes. These changes may develop into various physical signs and symptoms that can affect the individual's health, perceptions and interactions with others in her environment. The aim of the study was to assess the oral health status and treatment needs among pregnant women.

Methodology- Across-sectional study was conducted on 200 pregnant women visiting a hospital. Pre-validated pretested questionnaire was used to assess the socio-demographic variables. The clinical findings was done according to World Health Organization oral assessment form 1997. Descriptive analysis done using Statistical Package for Social Science version 21.0

Results- The mean age of the pregnant women in the study was 28.3(±5.53). The prevalence of periodontal diseases was found to be 74.5%. The mean decayed, missing, filled teeth (DMFT) of present study was 2.85 (± 1.41).

Conclusion - Since pregnant women are considered as priority group there is need for giving attention by integrating oral health as a part of antenatal and primary health care.

INTRODUCTION

The healthy future of society depends on the health of the children of today and their mothers, who are guardians of the future. Since the old wives' tale of "the loss of tooth for every pregnancy," oral health during pregnancy has long been a focus of interest. The 9-month period of pregnancy in a woman's life is defined not only by the development of her unborn child but also by the adaptive changes that her body undergoes to support the pregnancy. Pregnancy is a dynamic physiological state evidenced by several transient changes. These changes may develop into various physical signs and symptoms that can affect the individual's health, perceptions, and interactions with others in her environment (Gupta R and Acharya A, 2016).

During the past few years, there has been increasing interest in the oral health of pregnant patients. One reason is the reported association between maternal periodontal infection during pregnancy and obstetric complications including pre-eclampsia and premature birth. A second reason for interest in oral health and pregnancy is a concern for women's health as a goal in itself. Even among healthy women, the physiological changes that accompany pregnancy can lead to gingivitis, periodontitis and benign lesions (pregnancy tumors).

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Hormonal changes, along with modifications in diet and frequency of eating can increase the risk of developing tooth decay (Patil S *et al*., 2013).

The prevalence of periodontal disease ranges from 30% to 100% in some studies. Furthermore, high prevalence of some studies have shown that dental caries of 74% and 99.9% has been reported among pregnant women (Gupta R and Acharya A, 2016; Patil S *et al*.,2013).

Pregnancy gingivitis is a nonspecific, vascularizing, and proliferative inflammation with large amounts of infiltrated inflammatory cells. The onset of pregnancy gingivitis coincides with the selective growth of periodontal pathogens, such as Prevotella intermedia, in subgingival plaque from 3rd-4th month of pregnancy (Tilakaratne A *et al*., 2000). Increased proportion of Prevotella intermedia (previously Bacteroides intermedius), concomitant with an increase in gingivitis and elevated serum levels of estrogen and progesterone, have been shown during pregnancy (Kornman K and Loesche W, 1980). During pregnancy, gingival inflammation increases significantly from the first to the third trimester, with a maximum increase in the second trimester and a decrease at the end of 3 months postpartum. Multiple studies (Gupta R and Acharya A 2016; Patil S *et al* 2013; Tilakaratne A *et al*., 2000) have associated periodontal disease with premature birth and low birth weight of infants.

There is paucity of literature as regard to oral health status and treatment needs of pregnant women in primigravidae. Hence, the present study was conducted to assess oral health status and treatment needs among pregnant women of Pune city - a hospital based cross-sectional study.

MATERIAL AND METHODS

This is a cross-sectional analytical study conducted to assess oral health status and treatment needs among pregnant women visiting a hospital in Pune City, India.

The study protocol was approved by the Scientific Advisory committee and Institutional Ethics Committee of Sinhgad Dental College and Hospital, Pune. The study was conducted and reported as per strengthening the Reporting of Observational Studies in Epidemiology (STROBE, 2007) guidelines. A pilot study was conducted prior to the main study amongst 30 participants to check the feasibility and validity of the questionnaire. The sample size for the present study was calculated based on the data obtained from previous study (Gupta R and Acharya A, 2016). According to the previous study (Gupta R and Acharya A, 2016), overall dental disease proportion was found to be 85%. For the present study, the sample size was determined at 95% confidence interval. Sample size was calculated using the following formula: $(Z^2p(1-p)/d^2)$ was used. After substituting the values (z = 1.96, p = .085, d = 0.05) sample size came out to be 196 which was rounding off to 200. Pregnant women who were willing to give written informed consent to fill up the questionnaire, willing to participate and from all three trimester of pregnancy were included in study. Pregnant women giving history of any systemic disease and not willing to participate were excluded from study. The study included 200 pregnant women of all three trimester of pregnancy 20 to 40 year'sage group who were reporting to obstetrics and gynecology department of a City hospital.

Written informed consent was obtained from the study participants after explanation the nature of the study. The consent form was presented both in English and Marathi for easy understanding and convenience of the study participants. Patients who was unable to read the consent form were helped by communicating the details in the presence of or through the accompanying person if required. A structured pretested prevalidated questionnaire was interviewer-administered to the pregnant women to know the socio-demographic variables. All the questions were explained in the local language and the answers were recorded by the examiner. Pregnant women were examined for oral health status and treatment needs. Oral health status and treatment needs were assessed using the WHO Oral Health Assessment Form 1997(World Health Organization 1997).

Statistical Analysis

Data was analyzed using Statistical Package for Social Sciences (SPSS) v21.0 software package. Descriptive statistics such as mean, standard deviation, and percentage were used. Difference in association was evaluated using chisquare. *p* value less than 0.05 was considered significant.

RESULTS

The study included 200 primigravidae aged 20-40 years with a mean age of 28.3 years.

Demographic Characteristics. **Table I** shows the demographic characteristics of the pregnant women. Almost 30.5% of pregnant women had primary schooling and 40% of pregnant women were not working.

Table I Socio-demographic Details

Sr.No.	Question	Component of Question	Frequency (n=200)	Percentage (%)	p value
1.	Parity	a) Primipara	168	84	0.000*
		b) Multipara	32	16	
2	Planned Pregnancy	a) Yes	141	70.5	0.000*
		b) No	59	29.5	
3.	Pregnancy	a) Single	134	67	0.000*
		b) Multiple	66	33	
4.	Education	a) Primary = 1	61	30.5	
		b) High school =2	41	20.5	
		c) Trade/technical college =3	10	5	
		d) University degree =4	69	34.5	0.000*
		e) Post graduate degree=5	19	9.5	
5.	Employment Status	a) Full time	22	11	
		b) Part time	20	10	
		c) Looking for job	46	23	
		d) Home based paid work	32	16	0.000*
		e) Not Working	80	40	

(p value <0.05* statically significant)

Extra-oral Examination and Temporomandibular Joint(TMJ) Assessment -The pregnant women examined had normal extra-oral appearance, and only 5 (2.5%) pregnant women showed signs of TMJ disorder, that is, reduced jaw mobility.

Oral Mucosa Examination - On intraoral examination of the oral mucosa, 147 (73.5%) of the pregnant women had healthy mucosa, 37 (18.5%) had leukoplakia, 12 (6%) had ulceration and 04 (2%) had pyogenic granuloma (pregnancyepulis) and all the pregnant women with pyogenic granuloma were in their third trimester of pregnancy. (Table II)

Table II Distribution of study participants on the basis of presence of Oral Mucous Condition

Code	Oral Mucous Condition	Frequency (n=200)	Percentage (%)	p value
	No abnormal condition	147	73.5	
1	Malignant tumor	0	0	
2	Leukoplakia	37	18.5	
3	Lichen Planus	0	0	
4	Ulceration	12	6	< 0.05*
5	Acute necrotizing gingivitis	0	0	
6	Candidiasis	0	0	
7	Abscess	0	0	
8	Other condition	4	2	

(p value <0.05* statically significant)

Periodontal Condition - Periodontal condition was assessed using CPI (community periodontal index); only 50(25%) of the pregnant women had healthy periodontium, 60(30%) had bleeding, 79(39.5%) had calculus and 11 (5.5%) had pocket of 4-5mm. **(Table III)**

Periodontal Loss of Attachment - In the present study only 11(5.5%) pregnant women showed periodontal loss of attachment of 4-5mm. **(Table IV)**

DMFT score of study participants - DMFT score of study participants. Score 4 obtained in 77 (38.5%) study participants.**(Table V)**

Table III Distribution of study participants on the basis of presence of Community Periodontal Index

Code	Community Periodontal Index	Frequency (n=200)	Percentage (%)	p value
0	Healthy	50	25	
1	Bleeding	60	30	
2	Calculus	79	39.5	
3	Pocket 4-5 mm	11	5.5	
4	Pocket 6mm or more	0	0	<0.05[*]
X	Excluded sextant	0	0	
9	Not recorded	0	0	

(p value <0.05[*] statically significant)

Table IV Distribution of study participants on the basis of presence of Loss of Attachment

Code	Loss of Attachment	Frequency (n=200)	Percentage (%)	p value
0	0-3mm	189	94.5	
1	4-5mm	11	5.5	
2	6-8mm	0	0	
3	9-11mm	0	0	
4	12mm or more	0	0	<0.05[*]
X	Excluded sextant	0	0	
9	Not recorded	0	0	

(p value <0.05[*] statically significant)

Table V DMFT score of study participants

Sr. No.	DMFT score	Frequency (Percentage)
1.	0	2(1%)
2.	1	53(26.5%)
3.	2	30(15%)
4.	3	21(10.5%)
5.	4	7(38.5%)
6.	5	17(8.5%)

Dentition Status and Treatment Needs- The mean DMFT/person in the present study was 2.85 mean DT/person was 2.4, mean MT/person was 0.26, and FT/person was 0.17.(Table VI)

Table VI Mean of Decayed, Missing, Filled Teeth

Sr. No.	Clinical Finding	Mean	Standard Deviation
1.	Decayed Teeth	2.42	1.26
2.	Missing Teeth	0.26	0.56
3.	Filled Teeth	0.17	0.37

Mean and standard deviation of above clinical finding are represent in **Table VII**.

Table VII Mean and S.D. of Clinical Finding recorded

Sr. No.	Clinical Finding	Mean	Standard Deviation
1.	Oral Mucous Condition	0.20	0.40
2.	DMFT	2.85	1.41
3.	Total Community Periodontal Index	1.79	0.84
4.	Total Loss of Attachment	0.32	0.46

Prosthetic Status of study participants - It was found that only 1(0.5%) of the pregnant women had prosthesis in the upper jaw that is bridge and 2(1%) had prosthesis in the lower jaw that is bridge.**(Table VIII)**

Prosthetic Need of study participants- Only 3(1.5%) of the pregnant women had require one unit prosthesis in the upper jaw that is and 1(0.5%) had one unit prosthesis in the lower jaw.**(Table IX)**

Table VIII Prosthetic Status of study participants

Sr. No.		Frequency (Percentage)	Frequency (Percentage)
	Prosthetic Status	Upper	Lower
1.	No Prosthesis	199(99.5%)	198(99%)
2.	Bridge	1(0.5%)	2(1%)

Table IX Prosthetic Need of study participants

Sr. No.		Frequency (Percentage)	Frequency (Percentage)
	Prosthetic Need	Upper	Lower
1.	No Prosthesis Needed	197(98.5%)	199(99.5%)
2.	Need For One Unit Prosthesis	3(1.5%)	1(0.5%)

Need for Immediate Care and Referral - Only 18(9%) of present women had require need for Immediate Care and Referral.

Gestational Age and Community Periodontal Index, Periodontal Loss of Attachment - Statistically significant association between gestational age and periodontal condition of the pregnant women was seen ($p< 0.05$). No significant association between gestational age and loss of periodontal attachment in the present study.

DISCUSSION

Pregnancy constitutes a special physiological state characterized by a series of temporary adaptive changes in the body structure as a result of increased production of reproductive hormones that include estrogen, progesterone, gonadotropins and relaxin. The oral cavity is also affected by such endocrine actions and may present both transient and irreversible changes as well as modifications that are considered pathological (D´ıaz-Guzm´an L and Castellanos-Su´arez J,2004).

In the present study, the mean age of pregnant women was 28.3. In our study 30.5% of pregnant women had primary schooling which differ their attitude, knowledge, awareness towards oral health from those who are educated.

The prevalence of oral mucosal lesions in the present study is 26.5%, which was high as compared to study done by (Gupta R and Acharya A, 2016) (6.3%) and by (Annan B and Nuamah K, 2005) (4%). In our study prevalence of pregnancy epulis, which is a form of pyogenic granuloma, was 2%, which is similar to the study done by (Gupta R and Acharya A, 2016) (2%) and by (Annan B and Nuamah K, 2005) (3%). The relation between vascular lesions and pregnancy is possibly due to high levels of corticosteroids, though this has not yet been proven directly.

The prevalence of periodontal diseases in the present study is 74.5% which was similar to study done by (Arafat A, 1974) (76.7%). But high as compared to study done by (Wandera *et al*., 2009) (67.3%) and lower than studies done by (Gupta R and Acharya A, 2016) (95%), (Jago *et al*., 1984)(97%),

(Miyazaki *et al.*, 1991) (95%) and (Tonello *et al.*, 2007) (83.0%). This increased prevalence of periodontitis could be due to the poorer oral hygiene of the pregnant women that may have aggravated the influence of hormones on the periodontium. This could also be due to most pregnant women being illiterate and belonging and due to lack of awareness about the proficientoral hygiene practices. The present study showed periodontal loss of attachment measuring 4-5mm in only 5.5% which is slightly lower than study done by (Gupta R and Acharya A, 2016)(8.5) and can not be compared with those of other studies, loss of attachment has not been measured in most of the studies. In a follow-up study done by (Tilakaratne *et al.*, 2000) and (Taani *et al.*, 2003) the clinical loss of attachment remained unchanged in all the three trimesters among the pregnant women. This could probably be due to elevated hormone levels, characteristic of pregnancy not affecting the periodontal attachment. The most likely explanation for this result is that elevated levels of these hormones during the 9-month period is insufficient to cause significant breakdown, despite their reported effects on the epithelial barrier, vasculature, and connective tissue matrix(Tilakaratne *et al.*, 2000).

In our study the mean DMFT of study participants was 2.85 and mean DT,MT,FT was 2.42,0.26, 0.17 respectively of which mean DMFT and DT was similar with study conducted by (Gupta R and Acharya A,2016) were mean DMFT was 2.13 and mean DT was 2.06 and by (Pentapati *et al.*, 2013) (3.08). But mean MT and FT was high as compared to study done by (Gupta R and Acharya A, 2016) in which mean MT, FT was (0.17), FT (0.04) respectively and by (Vasiliauskiene I, 2003) (12.1). The low dental caries experience in the present study might be due to less exposure to refined carbohydrates and sugars and more exposed to fibrous food and increase decayed component represents people are unaware of dental service, lower utilization of dental services and fear from dental treatment large portion of unmet needs in present study population.

In our study prosthetic status in upper and lower jaw was 1(0.5%) and 2(1%) respectively whereas study done by (Gupta R and Acharya A, 2016) was 3(1%) of the pregnant women had prosthesis in the upper jaw that is bridge and none of the pregnant women had prosthesis in the lower jaw. Prosthetic Need in upper and lower jaw was 3(1.5) and 1(0.5) required one-unit prosthesis whereas study done by (Gupta R and Acharya A, 2016) was 9(3.0%) required one-unit prosthesis, 02(0.7%) required multiunit prosthesis, and 01(0.3%) required a combination of one- and/or multiunit prosthesis in the upper jaw and 19(6.3%) required one-unit prosthesis, 04(1.3%) required multiunit prosthesis in the lower jaw, and 05(1.7%) required a combination of one and/or multiunit prosthesis in the lower jaw.

In this study need for immediate care and referral required was 18(9%) whereas study done by (Gupta R and Acharya A, 2016) was 10(3.3%).

CONCLUSION

Dentistry can be vital in improving prenatal outcome and maternal or fetal dental health through screening, referral and education of pregnant women. It is important to understand that establishing a healthy oral examination is the most important objective in planning dental care for pregnant women.

Our study shown that the prevalence of oral mucosal lesions and periodontal disease was high and the mean DMFT recorded was less.

Pregnant women are considered as priority group so thereby need to integrate oral health as a part of antenatal care. Pregnancy offers an opportunity to educate women regarding oral health by providing a "teachable moment" inself-care with future children.(American Academy of Pediatric Dentistry, 2011).

Suggestions and Recommendations

We should educate the pregnant women about the importance of oral health as it relates to her health as well as her children heath. Encourage and assist pregnant women in seeking dental care during pregnancy. We should provide them and reinforce messages about achieving and maintaining good oral health. We should educate the mother about good oral health practices for their infant that help in reducing the risk of caries.Planned the government sector having dental screening, referral and education for pregnant women. Further studies should be carried out including primary and tertiary sector hospital for this population.

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