Oral-Health-Related Quality of Life during Pregnancy

Shashidhar Acharya, MDS; Parvati V. Bhat, MD

Abstract

Objectives: *The objectives of this study were to assess the differences in oral health and perceived oral-health-related quality of life (OHRQoL) between pregnant and nonpregnant rural Indian women and to describe factors that could possibly influence OHRQoL.* ***Methods:*** *A number of 259 pregnant (mean age 26 ± 5.5) and 237 nonpregnant (mean age 27.8 + 6.9) women who participated in the cross-sectional study were administered the Oral Health Impact Profile–14 questionnaire and underwent oral examination.* ***Results:*** *The results showed that the perceived OHRQoL was significantly poorer among the pregnant women than among nonpregnant women. The mean number of sextants with Community Periodontal Index for Treatment Needs scores of 2 and 3 and the gingival index scores were significantly ($P < 0.001$) higher among pregnant women than in the comparison groups. Factors such as pregnancy number ($P < 0.05$), decayed, missing, filled teeth scores ($P < 0.001$), and Gingival Index scores ($P < 0.001$) were significant predictors for OHRQoL.* ***Conclusion:*** *Oral health and perceived OHRQoL were poorer among pregnant women than among nonpregnant women.*

Key Words: pregnancy, oral-health-related quality of life, India

Introduction

Pregnancy is often thought to be a time of happiness for the expectant mother. However, studies suggest that physical functioning and perceptions of well-being among women in the later stages of pregnancy than in the prepregnancy period (1). A woman's pregnancy experience not only influences her own oral health status but also may increase her risk of other diseases. Hormonal changes during pregnancy have been suggested to predispose women to periodontal diseases (2). Any increase in tooth decay during pregnancy may be a result of changes in diet and oral hygiene. Nausea and vomiting in pregnancy can cause extensive erosion of tooth enamel. High levels of oral diseases may also have an impact on the oral-health-related quality of life (OHRQoL) as well. Although some studies on OHRQoL among pregnant women have been reported, they have been limited to exploring the impact of certain factors, such as pain, on the OHRQoL (3). The objectives of this study were to assess the differences in oral health and perceived oral-health-related quality of life between pregnant and nonpregnant rural Indian women and to describe factors that could possibly influence OHRQoL.

Materials and Methods

This study was carried out among women in various stages of pregnancy, reporting for antenatal checkup in the Department of Obstetrics and Gynaecology at a rural teaching hospital of Manipal University, India.

A convenience sample of all pregnant women (consecutive attendees) who reported for antenatal checkup in the months of January, February, and March 2007 consisted of the study population. Records of the hospital's obstetric center were reviewed every day in order to identify women who had scheduled appointments for antenatal checkup. These women were approached by one of the two interviewers who explained the objectives of the research to them and sought their consent. Those who agreed took part in a detailed, face-to-face interview and clinical examination in the comprehensive dental care center of the Department of Community Dentistry situated in the same hospital. Two hundred eighty-six pregnant women who reported during the study period were invited to participate in the study in which 260 agreed. One patient withdrew from the study at the time of clinical examination. A total of 237, who were not pregnant for at least the last 6 months (self-reported, based on the last menstrual cycle) and whose age matched nonpregnant women who reported during the same period, formed the comparison group and were also interviewed and clinically examined after providing informed consent. The comparison group was recruited among women who where either accompanying patients to the hospital or those women who were coming for periodic checkup of their newborns (after 6 months). Approval of the Institutional Review Board of Manipal University was obtained prior to the study.

Oral Health Impact Profile–14 (OHIP-14) (4) was included in the questionnaire as a measure of the social impact of problems that may compromise oral health. Subjects were asked if they had very often, fairly often, occasionally, hardly ever, or never experienced any of the problems assessed by the 14-item OHIP in the previous 12 months. The

Send correspondence and reprint requests to Dr. Shashidhar Acharya, 1-2-50B, "Bhagyashree," Kunjibettu, Udupi, Karnataka State 576102, India. Tel.: 91-820-2527031; e-mail: shashidhar_acharya@yahoo.com. Shashidhar Acharya is with the Department of Community Dentistry, Manipal College of Dental Sciences, Manipal University. Parvati V. Bhat is with the Department of Obstetrics and Gynaecology, Kasturba Medical College, Manipal University. Manuscript received: 11/01/2008; accepted for publication: 8/8/2008.

DOI: 10.1111/j.1752-7325.2008.00104.x

OHIP-14 scale scores ranged from 0 to 56 with higher scores indicating poorer OHRQoL. The OHIP-14 was translated into the Indian version according to accepted standards (5).

The Indian version of the OHIP-14 was validated in another study (Oral Health and Preventive Dentistry, unpublished), where Cronbach's α for internal consistency for the OHIP-14 instrument and its subscales were found to range from 0.5 to 0.87, respectively. Average inter-item correlations were between 0.34 and 0.47. Spearman's rank correlation was used to test the test–retest reliability. The coefficient values were high with the values for the domains ranging from 0.75 to 0.96. Validity of the questionnaire was also tested by correlating the OHIP-14 scores with clinical oral health status where a statistically significant ($r = 0.21$) correlation was observed between OHIP-14 scores and the DMFT scores.

Besides OHIP-14 items, the questionnaire included sociodemographic data such as age, educational level, employment status, and previous history of pregnancies. All oral examinations were performed the same day as the questionnaire was administered.

Clinical Examination. The examiners used World Health Organization (6) criteria to register decayed, missing, and filled teeth. The Community Periodontal Index for Treatment Needs (CPITN) (7) was used to assess periodontal health. The Gingival Index (8) was also used to assess gingivitis. The author and a postgraduate student conducted the examinations. Both of them had been calibrated in discussion sessions and trained for 2 days.

Statistical Analyses. Cohen's kappa was used to measure intra- and interexaminer variability. Intergroup comparisons were carried out by Mann–Whitney test. Linear regression analysis was carried out to assess the effect of various variables on OHRQoL by using the "stepwise forward selection" method. All statistical analyses were carried out by using the SPSS 13 (SPSS, Inc., Chicago, IL, USA) statistical software package.

Results

The mean age of the study and comparison groups was 26 ± 5.5 and 27.8 ± 6.9, respectively. The age of the pregnant women ranged from 20 to 37 and that of the comparison groups was from 20 to 36. Of the 259 cases, 121 had finished high school, and 74 were graduates. Of the cases, 234 were housewives. Similarly, 204 of the comparison group, too, were housewives, 63 were graduates, and 105 had finished high school. Cohen's kappa was used to assess intra-examiner and interexaminer variability and was found to range from 0.74 to 0.87, respectively.

A total of 100 percent of the study population suffered from some degree of gingivitis with the proportion suffering from mild, moderate, and severe gingivitis being 37.8 percent ($n = 98$), 39 percent ($n = 101$), and 23.2 percent ($n = 60$), respectively. The prevalence of caries was found to be 84 percent ($n = 218$). A total of 33.2 percent ($n = 86$) of the study population had periodontal pockets (pocket depth ≥ 4 mm.)

The mean number of sextants with a CPITN score of 2 and 3 was significantly higher among pregnant than among nonpregnant women. Similarly, the mean number of sextants with a score of 0 was significantly greater among nonpregnant women. It was found that the gingival index scores were significantly higher among the study group than among the comparison groups. No significant differences were noted when it came to the decayed, missing, filled teeth (DMFT) scores for the two groups (Table 1).

A comparison of the mean OHIP-14 scores of the study and the comparison groups revealed a statistically significant difference between six of the seven subdimensions including the average total score, with pregnant women having higher mean scores than the comparison group (Table 1). The results of the regression analysis (Table 2) showed that pregnancy number ($P < 0.05$), DMFT scores ($P < 0.001$), and Gingival Index scores ($P < 0.001$) were significant predictors for OHRQoL.

Discussion

The results of this study showed the periodontal health to be poor among the pregnant women when compared with their nonpregnant counterparts, which was in agreement with previous studies (9). However, no significant difference in the mean DMFT scores was observed between the pregnant women and the controls in this study.

The results of this study pointed to a poorer OHRQoL among pregnant women than the comparison groups, as reflected by a significant difference in all but the "Psychological Discomfort" aspect of the OHIP-14. "Pregnancy number" was found to be an important predictor with multiparous women having poorer OHRQoL. The study also showed that factors such as caries and periodontal health were important predictors of OHRQoL.

CPITN was used to measure periodontal health as a result of its simplicity, speed, international uniformity, and its endorsement by the World Health Organization for recording periodontal disease. In recent years, however, several authors have questioned the use of CPITN in measuring periodontal disease. Baelum and Papapanou (10) listed several of its short comings, i.e., the hierarchical principles underlying the use of the CPITN not being universally valid, the partial recording approach of the CPITN leading to gross underestimation of prevalence of deep pockets, and giving distorted estimates of severity of periodontal destruction in a given population.

It was seen that the perceived impact of oral health on the quality of life among the women was low. This may be explained by the facts that most of the respondents were below 35 years old and that people of the younger age group are known to cite a low impact of oral health on the quality of life. Another possible reason could have been a social desirability bias that may have resulted in the respondents' giving lower scores than usual on the OHIP-14 items. Another possible drawback of the

Table 1
Comparison of Oral Health Status and Oral-Health-Related Quality of Life among Pregnant and Nonpregnant Women

Variables	Mean (standard deviation)	95% Confidence interval	Significant differences
Oral health indicators			
DMFT (Mean)			
Pregnant	4.08 (3.6)	3.6-4.5	$P = 0.89$
Nonpregnant	3.51 (2.9)	3.1-3.9	
CPITN-0 (Mean number of sextants)			
Pregnant	0.66 (1.3)	0.5-0.8	$P < 0.01$
Nonpregnant	2.41 (1.5)	2.2-2.6	
CPITN-1 (Mean number of sextants)			
Pregnant	1.91 (1.7)	1.7-2.1	$P = 0.31$
Nonpregnant	1.71 (0.8)	1.6-1.8	
CPITN-2 (Mean number of sextants)			
Pregnant	2.66 (1.7)	2.4-2.9	$P < 0.001$
Nonpregnant	0.97 (0.8)	0.9-1.0	
CPITN-3 (Mean number of sextants)			
Pregnant	0.70 (1.3)	0.5-0.9	$P < 0.01$
Nonpregnant	0.29 (0.7)	0.2-0.4	
CPITN-4 (Mean number of sextants)			
Pregnant	0.10 (0.3)	0.1-0.2	$P = 0.91$
Nonpregnant	0.09 (0.3)	0.9-1.0	
GI score (Mean)			
Pregnant	1.25 (0.9)	1.1-1.4	$P < 0.001$
Nonpregnant	0.98 (0.3)	0.9-1.0	
OHIP-14 items			
Functional limitation			
Pregnant	0.8 (1.4)	0.6-1.0	$P < 0.01$
Nonpregnant	0.4 (0.9)	0.3-0.5	
Physical pain			
Pregnant	2.7 (1.9)	2.5-2.9	$P < 0.01$
Nonpregnant	1.2 (1.2)	1.1-1.3	
Psychological discomfort			
Pregnant	0.8 (1.4)	0.6-1.0	$P = 0.24$
Nonpregnant	0.7 (1.1)	0.6-0.8	
Physical disability			
Pregnant	1.2 (1.7)	1.0-1.4	$P < 0.05$
Nonpregnant	0.7 (1.0)	0.6-0.8	
Psychological disability			
Pregnant	0.7 (1.3)	0.5-0.9	$P < 0.01$
Nonpregnant	0.4 (0.8)	0.3-0.5	
Social handicap			
Pregnant	0.4 (0.9)	0.3-0.5	$P = 0.04$
Nonpregnant	0.2 (0.8)	0.1-0.3	
Handicap			
Pregnant	0.3 (0.9)	0.2-0.4	$P < 0.05$
Nonpregnant	0.6 (0.9)	0.5-0.7	
Overall OHIP-14 score			
Pregnant	7.0 (6.6)	6.2-7.8	$P < 0.01$
Nonpregnant	4.2 (3.8)	3.7-4.7	

$P \leq 0.05$, significant.
DMFT, decayed, missing, filled teeth; CPITN, Community Periodontal Index for Treatment Needs; OHIP-14, Oral Health Impact Profile; GI, Gingival Index.

study was that of the reference period of the OHIP-14. Because the standard reference period of the OHIP-14, i.e., 6 months would have been insufficient to record the impact of pregnancy on OHRQoL, a 12-month reference period was selected. It is possible that reported impact of pregnancy on OHRQoL would become diluted to some extent as a result of the extended reference period.

The results of this study showed that oral health and perceived OHRQoL were poorer among

Table 2
Multiple Regression Analysis (Stepwise Forward Selection) with the OHIP-14 Score as the Dependent Variable

	Dependent variable – OHIP-14 score			
Predictor	Beta coefficient	Standard error coefficient	*T* value	*P* value
Age	−0.10	0.06	−1.78	0.07
Education	0.04	0.05	0.68	0.50
Pregnancy number	0.17	0.07	2.54	0.01
Decayed, missing, filled teeth	0.30	0.05	5.84	$P < 0.01$
Community Periodontal Index score	0.05	0.03	−1.31	0.19
Gingival Index score	0.26	0.05	5.63	$P < 0.01$

$P \leq 0.05$, statistically significant.
OHIP-14, Oral Health Impact Profile.

pregnant women than nonpregnant women and highlighted the role of factors such as pregnancy number, caries, and periodontal health as important predictors of OHRQoL. The study also drew attention toward the need for highlighting the importance of maintaining oral health during pregnancy.

References

1. Haas JS, Jackson RA, Fuentes-Afflick E, Stewart AL, Dean ML, Brawarsky P, Escobar GJ. Changes in the health status of women during and after pregnancy. J Gen Intern Med. 2005;20:45-51.
2. Amar S, Chung KM. Influence on hormonal variations on the periodontium in women. Periodontol 2000. 1994;6:79-84.
3. De Oliveira BH, Nadanovsky P. The impact of oral pain on quality of life during pregnancy in low-income Brazilian women. J Orofac Pain. 2006 Fall;20(4):297-305.
4. Slade GD. Derivation and validation of a short-form oral health impact profile. Community Dent Oral Epidemiol. 1997; 25:284-90.
5. Beaton DE, Bombardier C, Guillemin F, Bosi Ferraz M. Guidelines for the process of cross-cultural adaptation of self report measures. Spine. 2000;25: 3186-91.
6. World Health Organization. Oral health surveys – basic methods. 4th ed. Geneva: WHO; 1997.
7. Cutress TW, Hunter PBV, Hoskins DIH. Comparison of the Periodontal Index (PI) and Community Periodontal Index of Treatment Needs (CPITN). Community Dent Oral Epidemiol. 1986;14:39-42.
8. Loe H, Silness J. Periodontal disease in pregnancy. I. Prevalence and severity. Acta Odontol Scand. 1963;21:533-51.
9. Lieff S, Boggess KA, Murtha AP, Jared H, Madianos PN, Moss K, Beck J, Offenbacher S. The oral conditions and pregnancy study: periodontal status of a cohort of pregnant women. J Periodontol. 2004;75:116-26.
10. Baelum V, Papapanou PN. CPITN and the epidemiology of periodontal disease. Community Dent Oral Epidemiol. 1996; 24:367-8.