Self-reported prenatal oral health-care practices of preterm low birth weight-delivered women belonging to different socioeconomic status: A postnatal survey

Gayathri Priyadarshni Elangovan, Jananni Muthu, Indra Kumar Periyasamy, Pratebha Balu, R. Saravana Kumar

Abstract:
Background: The differences in the oral health status between the individuals with a high socioeconomic status (SES) and those with a low SES had markedly increased. There is, however, minimal information available on women understanding the need of dental hygiene for overall health and whether pregnant women comply with the current oral health strategies. In Lieu with the above, the present study aims to assess the awareness, dental hygiene practices, and the frequency of dental visits during pregnancy in postnatal women who delivered preterm low birth weight babies of different SES in and around Puducherry. Materials and Methods: A total of 200 individuals who visited Rajiv Gandhi Maternity Centre, Puducherry for delivery were selected. Information regarding onset of prenatal care, referral to dentist, and oral hygiene habits such as frequency of brushing, type of brush used, method of brushing, and frequency of brush change were obtained. Periodontal health status was recorded using PSR system. Results: Awareness of oral hygiene practices was more among upper middle class and lower middle class compared to upper lower strata. Visit to dentist during perinatal period was high among upper middle class compared to other socioeconomic strata. Conclusions: The awareness of oral health-care practices and importance of oral care during perinatal period were less among low socioeconomic strata.

Key words: Awareness, oral hygiene practice, periodontal screening and recording, socioeconomic status

INTRODUCTION

Perinatal oral health plays a crucial role in the overall health and well-being of pregnant women. The perinatal period is defined as the period around the time of birth, beginning with the completion of the 20th through 28th week of gestation and ending 1–4 weeks after birth. Reflection of hormonal changes during pregnancy on periodontium is well documented.

During pregnancy, the inflammatory response to oral bacteria is exacerbated by fluctuations in estrogen and progesterone levels, changes in oral flora, and a decreased immune response. It is also observed that existing gingival problems were aggravated during pregnancy and lead to severe forms of periodontal diseases. The prevalence of gingival inflammation during pregnancy is termed as “pregnancy gingivitis” and it may vary from 30% to 100% of pregnant women. In 1996, Offenbacher et al. first reported a potential association between maternal periodontal disease and preterm low birth weight delivery. Although most of the periodontal changes are transient, they might still require proper personal and professional oral care.

In spite of these findings, the importance of oral hygiene practices, oral health assessment, and referral of pregnant mothers to dentist are not routinely incorporated into prenatal visits by the physician. Gynecologists/obstetricians and other medical professionals are more likely to see expecting mothers much earlier than...
dentists. Thus, it is essential for these specialists to be aware of the systemic influence of periodontal diseases and make an emphasis on oral hygiene practices and appropriate decisions regarding timely and effective intervention. Periodontal disease is both preventable and treatable.

Controlling plaque by brushing, flossing, and professional prophylaxis will help the pregnant women to achieve good dental health in pregnancy. The differences in the oral health status between the individuals with a high socioeconomic status (SES) and those with a low SES had markedly increased. There is, however, minimal information available on women understanding the need of dental hygiene for overall health and whether pregnant women comply with current oral health strategies. The aim of the present study is to assess the awareness about oral hygiene practice and frequency of dental visit among women from different socioeconomic strata who delivered preterm low birth weight infant in and around Puducherry.

MATERIALS AND METHODS

The study was approved by Institutional Ethical Committee of Indira Gandhi Institute of Dental Sciences, Puducherry. The study was carried out at Rajiv Gandhi Maternity and Child Hospital, Puducherry after obtaining the necessary permissions from the state ministry of health and family welfare. The study was conducted from January 2015 to May 2016. A total of 200 individuals who had delivered preterm low birth weight babies were selected depending on the inclusion criteria. Individuals with age ranging from 18 to 35 years and who delivered at <37 weeks of gestation and birth weight of the baby being <2500 g were included in this study. Individuals with known systemic conditions such as diabetes, hypertension, mother who delivered normal weight babies and delivered on term were excluded from the study. The patients were examined within 3-day postpartum. The purpose of the study was explained to the individuals, and written informed consent for participating in this study was obtained.

Information regarding onset of prenatal care, referral to dentist, and oral hygiene habits such as frequency of brushing, type of brush used, method of brushing, and frequency of brush change were obtained from self-reported history from the individuals.

Modified Kuppuswamy socioeconomic scale was utilized in this study for the stratification of the patients based on SES. The information was collected regarding the person’s occupation, education, monthly income, the number of individuals in the family, and the education, occupation, and total monthly income of the family from all individuals. This information was used for determining the SES of the individual using modified Kuppuswamy scale [Tables 1 and 2].

Periodontal status was recorded for the individuals using periodontal screening and recording (PSR) system. Six measurements for each tooth are obtained, utilizing a special ball-tipped probe. This probe has a 0.5 mm ball at the tip and a color-coded area 3.5–5.5 mm from the tip. The probe may be plastic or metal. The ball at the end of the probe is intended to enhance patient comfort and assist in detecting overhanging margins and subgingival calculus. The probe is inserted into the sulcus or pocket and walked around the circumference of each tooth. This method is the same technique used as with a comprehensive periodontal examination. However, the PSR system is unique in the way the probe is read. The clinician need only observes the position of the color-coded band in relation to the gingival margin. The presence of furcation involvement, mobility, mucogingival problems, or recession should also be noted. After each tooth in the sextant has been examined, only the highest code obtained is recorded and only one score is recorded for each sextant. If a sextant is edentulous, an “X” is placed. Measurements are recorded in a special box chart.

Findings are represented as codes in PSR system. Code 0 – the colored area of the probe remains completely visible in the deepest crevice of the sextant. There is no calculus or defective margins detected. The gingival tissues are healthy with no bleeding after gentle probing. Code 1 – the colored area of the probe remains completely visible in the deepest probing depth in the sextant. There is no calculus or defective margins detected. However, there is bleeding after probing. Code 2 – the colored area of the probe remains completely visible in the deepest probing depth in the sextant. Supragingival or subgingival calculus and/or defective margins are detected.
The observation of periodontal disease severity among the sample individuals is tabulated in Table 9. Gingivitis was high in upper lower class group (89.6%) and upper middle class group (74.4%). Localized periodontitis was high in upper middle class group (20.9%) compared to lower middle class group (6.9%) and upper lower class group (4.9%). Generalized periodontitis was high in upper lower class group (4.9%) compared to upper middle class group (4.7%) and lower middle class group (3.5%).

**DISCUSSION**

The awareness and attitude of an individual that reflects their oral health status can be influenced by SES.[17]

A total of 200 individuals who delivered preterm low birth weight babies of different SES were enrolled in this study to assess their prenatal oral health care practices during pregnancy. Modified Kuppuswamy scale were used to categorize the SES.[13] The study sample examined could be categorized into the following three socioeconomic class of modified Kuppuswamy’s socioeconomic scale which is upper middle, lower middle, and upper lower.

Majority of our study participants belonged to lower middle class category (57.7%). This study was conducted in a
government maternity hospital and the patients attending the outpatient department of that institute happened to belong to the lower socioeconomic strata, and according to the modified Kuppuswamy scale criteria, 57.7% of the sample fell under lower middle class category.

The individuals were assessed for brushing frequency, number of meals per day, dental visits during pregnancy, and periodontal status. Mean age of individuals of our study was 23.8 ± 2.9 years, gestational period was 33.8 ± 1.4 months, weight of the baby was 1.6 ± 2.4 kg, and mother’s hemoglobin level was 11.3 ± 1.4 g/dl.

Frequency of brushing teeth twice daily was high in individuals belonging to upper middle class (28%) compared to lower middle (23.3%) and upper lower (23%). Similar results were obtained in the study done by Gautam et al.\[18\] where the individuals belonging to upper middle class brushed twice daily as compared to lower middle and upper lower. Similarly, Davidson et al,\[19\] also found that general awareness about the oral hygiene habits is high in individuals belonging to higher SES. Awareness of importance of oral hygiene among individuals belonging to upper middle class seems to be reason for increased frequency of brushing.

Information regarding number of meals per day was obtained from study participants to assess the nutritional status of preterm mothers. Intake of meals thrice daily was found to be higher in lower middle (88.7%) followed by upper middle class (88.4%) compared to upper lower class groups (80.5%). Majority of the individuals belonging to upper lower class skip their morning breakfast due to lack of time and their working schedule and this is probably the reason for decreased frequency of meals.

Majority (63.3%) of the pregnant women had a complaint of bleeding gums during pregnancy. Even those individuals with gingival problems did not consider such a condition serious enough to be addressed, and it appears that signs of gingival inflammation are often regarded as a “normal” and hence they did not attend the dentist. In this study, only individuals belonging to upper middle class group (11.2%) and lower middle class group (1.7%) visited dentist during pregnancy. These findings were similar to the study done by Newman et al.,\[20\] and Sanders et al.,\[21\] in which there is positive association between higher socioeconomic groups and better periodontal status. The reason for not having dental visit among upper lower class is due to fear, misconception regarding effects of dental treatment on the developing fetus, lack of time and awareness among individuals because majority of individuals are working as daily wages and the high cost of dental services and prolonged appointment time may discourage the individuals in the lower class not to have a dental visit on a routine basis.

Most of the individuals belonging to upper lower class had PSR scores 2 and 3 whereas most of the upper middle class had PSR score 1 as compared to lower middle and upper lower. This finding is similar to the study done by Gautam et al.,\[18\] where they used CPI index code. Periodontal disease severity was highest among the lowest socioeconomic strata.\[18\]

Many studies are available in literature to correlate the oral health and SES of individuals. Observations from these studies reveal results similar to the present study. Gundala et al.,\[22\] in a cross-sectional study to correlate the periodontal health of people with reference to lifestyle, education level, and SES showed significant decrease in periodontitis when income and education levels increased. Furthermore, the prevalence of periodontitis associated with a healthy lifestyle is significantly lower when compared to an unhealthy lifestyle.

Borrell et al.,\[23\] reported that individual-level income and education were associated with severe periodontitis among Western population and African Americans, and these associations remained significant after adjustment for age, gender, recruitment center, and neighborhood socioeconomic score.

Bertoldi et al.,\[24\] in an observational survey found that the SES has an inverse relationship with tooth loss and conservative endodontic therapy but a direct relation with worsening of the periodontal condition. Bonfim Mde et al.,\[25\] in Brazilian population reported that periodontal health is worse in the group for which the social indicators are worse. Therefore, the social determinants of health also affect the severity of periodontal disease in adult’s Brazilian society.

To the best of our knowledge, there are very few studies to explore the effects of SES of pregnant women and impact on oral health. The results of this study place an emphasis on the

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**Table 8: Relation between periodontal screening and recording codes and the socioeconomic status**

| Age category (years) | Sextant examined | Score 0 (%) | Score 1 (%) | Score 2 (%) | Score 3 (%) | Score 4 (%) |
|---------------------|-----------------|-------------|-------------|-------------|-------------|-------------|
| Upper middle        | 258             | 0           | 139 (53.9)  | 104 (40.3)  | 15 (5.8)    | 0           |
| Lower middle        | 696             | 0           | 309 (44.4)  | 354 (50.8)  | 33 (4.8)    | 0           |
| Upper lower         | 246             | 0           | 104 (42.3)  | 126 (51.2)  | 16 (6.5)    | 0           |

**Table 9: Relation between disease severity and socioeconomic status**

| Socioeconomic class | Gingivitis, n (%) | Localized periodontitis, n (%) | Generalized periodontitis, n (%) | Total |
|---------------------|-------------------|--------------------------------|---------------------------------|-------|
| Upper middle        | 32 (74.4)         | 9 (20.9)                       | 2 (4.7)                         | 43    |
| Lower middle        | 104 (89.6)        | 8 (6.9)                        | 4 (3.5)                         | 116   |
| Upper lower         | 37 (90.2)         | 2 (4.9)                        | 2 (4.9)                         | 41    |
| Total               | 173               | 19                             | 8                               | 200   |

\(n\) – Number of cases
importance of oral hygiene education care and interventional therapies during pregnancy to improve the periodontal health status.

Limitations of the study are that the sample might not truly represent the community as a whole. Studies with larger sample size are needed to confirm the results and most of the variables are self-reporting and might not be very dependent and reliable.

CONCLUSIONS

This study found an association between periodontal health and socioeconomic strata. The awareness of oral health-care practices and importance of oral care during prenatal period were less among low socioeconomic group. Proper oral hygiene instruction and educating pregnant mothers of lower socioeconomic group about the importance of oral hygiene during pregnancy are very necessary. A dental and obstetric coordination like timely referral of the individuals during pregnancy by gynecologists/obstetricians to dentist is essential for maternal oral health and perinatal outcomes.

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CONFLICTS OF INTEREST

There are no conflicts of interest.

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