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Periodontology

EVALUATION OF MATERNAL PERIODONTAL STATUS AMONGST PRE-TERM AND FULL-TERM DELIVERED BABIES-A CASE CONTROL STUDY

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ABSTRACT Pre-term birth along with baby having low weight at the time of birth is thought to be a major cause which leads to infant morbidity as well as mortality. The aim of this study was to evaluate is there any relationship between periodontal health of mother and preterm delivery of the baby and to assess the correlation between the gestational age with maternal periodontal clinical parameters. Case control study was planned and total of twenty systemically healthy women aged between 18-35 years were taken for study. Cases were those patients with PTB and infants with birth weight lower than normal, whereas control group had patients with FTB and normal birth weight infants. Based on the study's findings, periodontitis appears to have a significant impact on pregnancy outcomes. Confirming the link between preterm births and maternal periodontitis will require multicenter, randomized controlled clinical trials.

KEYWORDS : pre-term birth, full-term birth, low birth weight baby, maternal periodontal status.

INTRODUCTION

Preterm births (PTBs) are defined by the World Health Organization as any birth that takes place before 37 weeks of gestation or less than 259 days following the first day of a woman's last menstrual cycle [1]. PTB can be further be subdivided into three categories according to gestational age: very preterm (28–32 weeks), intermediate preterm (32–37 full weeks of gestation), and extremely preterm (<28 weeks) [2].

Prematurity is often seen to be associated with a higher risk of newborn death, particularly if birth occurs before 34 weeks of gestation [3]. Various causes which have led to preterm birth of child are extreme age of the mother, low socioeconomic status of the family, habit of smoking, drug use and other systemic diseases association [4].

Pre-term birth has shown association with infections specifically genitourinary infections which results in increase in production of proinflammatory cytokines such as IL-1, IL-6, TNF alpha and prostaglandin and these will ultimately cause uterine contractions and resultant low birth weight infant [5]. Young or old age, nutritional status, prenatal and antenatal care, alcohol and smoke use, chronic inflammation, and infections are among the maternal risk factors for PTB [6].

Offenbacher et al has proven that there is a seven-times more chance of delivery of preterm low birth weight (PLBW) or PTB baby if the mother has periodontal disease [7]. Taking into consideration we have planned the study, To assess the connection between premature birth of infant and the mother's periodontal health.

To compare the clinical characteristics of periodontal disease with gestational age.

MATERIALS AND METHODS

Case control study was planned in which patients who reported to the Department of Obstetrics and Gynaecology, civil Hospital, Hingoli were included. A total 20 patients aged between 18-35 years were selected. Patients with any systemic diseases, chronic infectious diseases, gestation at high risk were not included in the study. Patients were divided into cases and controls.

Cases included PTB with low birth weight infants while control group included FTB with infants having normal weight at the time of birth. Cases were selected as those mothers who had delivery before 37 weeks of gestation completion whereas controls were those women with delivery at or after 37 weeks of gestation. The study was conducted at civil hospital, Hingoli after taking ethical approval. The entire planned procedure was explained to the patients and informed consent was taken from them. Data on maternal age, weight of the baby at the time of delivery, gestational period was recorded from the patients record at the hospital.

Various clinical parameters recorded were Simplified Oral Hygiene Index given by Green and Vermillion, Probing pocket depth (PPD) and Clinical attachment level (CAL). Williams graduated probe was used to conduct the clinical examination. Probing pocket depth ≥4 mm and clinical attachment level ≥3mm were considered as those having chronic localised periodontitis. After collection of data, ANOVA was used to compare the clinical parameters for pre-term and the full-term groups. Using SPSS Version 22.0 software, statistical analysis was done.

RESULTS

In this study, total of 20 participants were taken into consideration ranging from age between 18-35 years. They were divided into cases and controls. Cases were with PTB and birth weight of infant lower than normal and controls were with FTB and normal birth weight infants. The mean of women's age in PTB was 25.1±5.65 years, whereas for women in FTB was 24.3±3.74 years. Mean gestational period for PTB was 32.7±2.16 weeks whereas for FTB it was 37.9±0.74weeks. The mean weight of infants in PTB was 1.63±0.69 kgs whereas for FTB was 3.29±0.3 kgs which was statistically significant. [table-1, And Table-2]

Table-1 Pre-term Group

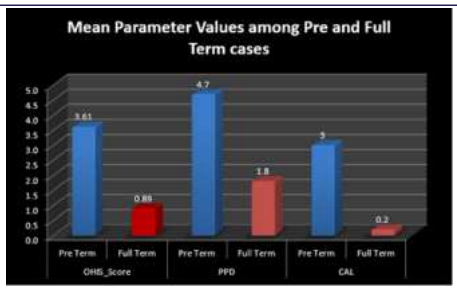
	Mean	Std Dev	Minimum	Maximum
Mother's Age	25.1	5.65	19	34
Birth Weight	1.63	0.69	0.7	2.6
Gestational_period	32.7	2.16	30	35

Table-2 Full-term Group

	Mean	Std Dev	Minimum	Maximum
Mother's Age	24.3	3.74	19	31
Birth Weight	3.29	0.3	2.9	3.9
Gestational_period	37.9	0.74	37	39

Comparison was done between various clinical parameters among pre-term and full-term group. OHIS score, PPD and CAL was recorded and following were the results obtained.

Comparison between pre-term and full-term groups



Correlation between gestational period and clinical parameters were obtained and it was as shown below **[table-3**]

Table-3 Correlation Between Gestational Period And Clinical Parameters:

Group	OHIS Score	PPD	Cal
Pre-term	-0.107	0.617	-0.154
Full-term	0.15	-0.286	-.643[a]
Overall	-.834[a]	-.719[a]	-.848[a]

DISCUSSION

Among 20 women who participated in this case control study were admitted to the department of Obstetrics and Gynaecology at Civil Hospital, Hingoli. The mean maternal age in PTB group was 25.1±5.65 years, while in FTB it was 24.3±3.74 years, which showed no statistically significant difference between both the groups. The period of gestation in PTB group was 32.7±2.16 weeks and for FTB group it was 37.9±0.74weeks. Birth weight of infant within PTB group was 1.63±0.69 kgs while it was 3.29±0.3 kgs for FTB group.

One commonly used criterion for diagnosing periodontitis is clinical attachment loss (CAL) [8]. Mean Probing pocket depth (PPD) in PTB group was 4.7±0.67 mm while the mean PPD was 1.8±0.63 mm in FTB group. Mean Clinical attachment level in PTB group was 3±0.67 mm whereas it was 0.2±0.42 mm in FTB group. In this study it was found that, clinical attachment was more in the PTB group as compared to FTB group. In the current study, there was significant association between PPD (4.7±0.67 mm) and birth weight of infant was (1.63±0.69 kgs) in the PTB group in comparison to FTB group. This finding was related with a study conducted by Agueda et al [9]. The present study showed within full-term cases gestational period is negatively correlated with CAL. In pre-term cases no correlation is found between the gestational age and clinical parameters.

When overall cases are considered the association between the gestational age and all maternal clinical parameters is high and significant. Gestational age is negatively correlated with the clinical parameters. The specific mechanism underlying this link remains unclear; however, the association may be supported by microbial similarities found between the female vaginal tract and the oral cavity [10]. There is mounting evidence that mouth bacteria, particularly Pseudomonas gingivalis, can infiltrate the tissues of the placenta and set off inflammatory reactions that release effector molecules linked to premature birth [11].

CONCLUSION

Based on the study's findings; periodontitis may have a negative impact on the course of pregnancy. However, multicenter randomized controlled trials must be carried out in order to verify the link between low birth weight newborns and the presence of maternal periodontal status and PTB. It will be beneficial to encourage young women to have early periodontal disease identification and treatment before and throughout pregnancy, especially for women who are at risk.

Limitations

1. Bias in the population's selection because the sample was restricted to expectant mothers who lived in the same city and were affiliated with the local hospital.
2. Sample size selection was small, studies on larger sample size are required to prove the association between maternal periodontitis and its effect on delivery outcomes.
3. If the microbial analysis would have taken into consideration, then it would have substantiated the clinical findings.

REFERENCES

[1] WHO: recommended definitions, terminology and format for statistical tables related to the perinatal period and use of a new certificate for cause of perinatal deaths. Modifications recommended by FIGO as amended October 14, 1976. (1977). Acta obstetricia et gynecologica Scandinavica, 56(3), 247–253.
[2] Marlow N. (2012). Full term; an artificial concept. Archives of disease in childhood. Fetal and neonatal edition, 97(3), F158–F159. https://doi.org/10.1136/fetalneonatal-2011-301507
[3] Rakoto-Alson, S., Tenenbaum, H., & Davideau, J. L. (2010). Periodontal diseases, preterm births, and low birth weight: findings from a homogeneous cohort of women in Madagascar. Journal of periodontology, 81(2), 205–213. https://doi.org/10.1902/jop.2009.090351
[4] Schneider, H. G., Gobbels, E., & Apel, E. M. (1989). Die Simplifizierung der Plaque-Index-Methode nach Quigley und Hein [Simplification of plaque index method of Quigley and Hein]. Stomatologie der DDR, 39(2), 91–94.
[5] Evaldson, G., Carlström, G., Lagrelius, A., Malmborg, A. S., & Nord, C. E. (1980). Microbiological findings in pregnant women with premature rupture of the membranes. Medical microbiology and immunology, 168(4), 283–297. https://doi.org/10.1007/BF02121812
[6] Blencowe, H., Cousens, S., Chou, D., Oestergaard, M., Say, L., Moller, A. B., Kinney, M., Lawn, J., & Born Too Soon Preterm Birth Action Group (2013). Born too soon: the global epidemiology of 15 million preterm births. Reproductive health, 10 Suppl 1(Suppl 1), S2. https://doi.org/10.1186/1742-4755-10-S1-S2.
[7] Offenbacher, S., Katz, V., Fertik, G., Collins, J., Boyd, D., Maynor, G., McKaig, R., & Beck, J. (1996). Periodontal infection as a possible risk factor for preterm low birth weight. Journal of periodontology, 67(10 Suppl), 1103–1113. https://doi.org/10.1902/jop.1996.67.10s.1103
[8] Offenbacher, S., Lieff, S., Boggess, K. A., Murtha, A. P., Madianos, P. N., Champagne, C. M., McKaig, R. G., Jared, H. L., Mauriello, S. M., Auten, R. L., Jr, Herbert, W. N., & Beck, J. D. (2001). Maternal periodontitis and prematurity. Part I: Obstetric outcome of prematurity and growth restriction. Annals of periodontology, 6(1), 164–174. https://doi.org/10.1902/annals.2001.6.1.164
[9] Agueda, A., Ramón, J. M., Manau, C., Guerrero, A., & Echeverría, J. J. (2008). Periodontal disease as a risk factor for adverse pregnancy outcomes: a prospective cohort study. Journal of clinical periodontology, 35(1), 16–22. https://doi.org/10.1111/j.1600-051X.2007.01166.x
[10] Hill G. B. (1998). Preterm birth: associations with genital and possibly oral microflora. Annals of periodontology, 3(1), 222–232. https://doi.org/10.1902/annals.1998.3.1.222
[11] Boggess, K. A., Moss, K., Madianos, P., Murtha, A. P., Beck, J., & Offenbacher, S. (2005). Fetal immune response to oral pathogens and risk of preterm birth. American journal of obstetrics and gynecology, 193(3 Pt 2), 1121–1126. https://doi.org/10.1016/j.ajog.2005.05.050