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Original Research Article

Fetomaternal Outcome in Maternal Periodontal Disease

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Abstract: The objective is to find out the incidence and type of periodontal diseases during pregnancy and its relationship with adverse pregnancy outcome. This is a retrospective, case-control study involving 500 participants selected at random within 72 hours of delivery from 1st June 2011 to 31st May 2012 in the department of Obstetrics and Gynaecology, Gauhati Medical College and Hospital in collaboration with Deptt. of Periodontics, Regional Dental College , Guwahati 32, Assam, India. Periodontal disease was considered to be present when the periodontal disease index was found to be more than 4 (Group I) and the rest belonged to Group II. Pre-eclampsia, PROM, PPROM, preterm delivery, IUGR and stillbirth were included in the outcome parameters. Out of total 500 cases, 160 (32%) had periodontal disease and 340 (68%) did not suffer from the same. Missed teeth and caries in teeth led to higher incidence of periodontal disease. While regular brushing and rinsing of mouth reduces its occurrance, PROM was found more commonly (32%) in Group I. Similarly, the incidence of pre-eclampsia (8.7%) was higher in Group I. Periodontal diseases did not alter the incidence of PPROM, IUGR or stillbirth. Complication rates were similar irrespective of the severity of the disease. Pregnant mothers with periodontal disease may have adverse outome like PROM, pre-eclampsia and preterm birth. Treatment during pregnancy may not reduce the risk of preterm birth. Early detection and treatment of periodontal disease in young women before and during pregnancy will be beneficial for women at risk.
Keywords: periodontal diseases, pre-eclampsia, preterm birth

INTRODUCTION

In the last two decades, the scientific community has demonstrated a growing interest in determining whether periodontal disease is associated with pregnancy complications. It has been suggested that periodontal disease, through its systemic effect, may lead to pregnancy complications and its adverse outcome.

Periodontal disease refers to gingivitis (inflammatory condition of soft tissue surrounding the tooth) and periodontitis (destruction of supporting structure like periodontal ligament, bone, cementum), and are chronic infections related to gram-negative bacteria. They, in turn, lead to loss of connective tissue attachment and tooth support. They also result in the local and systemic elevation of inflammatory mediators and cytokines. Periodontal disease thus involve both direct tissue damage due to plaque, bacterial products and indirect tissue damage due to host inflammatory response. Periodontal disease severity increases especially during second and third trimester of pregnancy because of progesterone and estradiol which enhances gingival vascular permeability and increases prostaglandin E-2. Bacteria and their shed virulence factors may enter the blood stream, disseminate throughout the body and trigger the induction of systemic inflammatory responses. They then appear to reach the placenta possibly causing its infection. This placental tissue damage may lead to the various mentioned complications. Thus, pregnant women are at higher risk for developing gum disease than the general public, simply because of hormonal changes; tissues tend to react more severely to the irritations that are present. So while bacteria level may be same in both pregnant and non-pregnant women, pregnant women are more liable to develop periodontal disease.

Periodontal infections are treatable and preventable, therefore viewed as modifiable factor.

Integration of periodontal care into obstetric management may improve pregnancy outcome.

Aims and Objectives

1. To find out the incidence of periodontal diseases amongst pregnancies.
2. To analyse the type of periodontal diseases.
3. To detect the relationship of various periodontal diseases with different adverse pregnancy outcomes.

MATERIALS AND METHODS

Study setting

The study was conducted in the Department of Obstetrics and Gynaecology, Gauhati Medical College and Hospital, Guwahati in collaboration with Department of Periodontics at Regional Dental College and Hospital, Guwahati.

Study design

Hospital based, retrospective, case-control study.

Study period

From 1st June 2011 to 31st May 2012.

Patient selection

Eligible participants (500 women) were selected randomly within 72 hours of delivery, between age 18-35 yrs, and who had delivered after 28 wks of period of gestation. Accordingly they were divided into 2 (two) groups-

GROUP I – women with evidence of periodontal disease.
GROUP I I– women with no evidence of periodontal disease.

Exclusion criteria

Women <18 yrs or >35 yrs, with previous history of abortion or fetal death, presence of any chronic disease like diabetes mellitus, hypertension, TB, renal disease, liver disease, HIV, etc, women with previous history of PIH, preterm delivery, small for gestational age baby. Women with known uterine anomalies or cervical incompetence, presence of history of smoking or alcohol intake, severe anaemia (Hb<7g/dL), or with symptoms or documentation of infection at any another site.

Methodology

Proper consent from each participant was taken. After taking a detailed history (including dental history), complete systemic and obstetrical examination was carried out. Gestational period was calculated and maternal outcome parameters (e.g. PPROM, PROM, Preterm birth, pre-eclampsia, small for gestational age and stillbirth) and fetal parameters noted. Dental examination was done by expert dentists within 72 hrs of delivery and periodontal disease was assessed using PDI (Periodontal Disease Index).

PDI= TOTAL GINGIVAL INDEX OF EACH TOOTH/NO. OF TEETH EXAMINED.

Scoring- 0 (minimum score) → 6 (maximum score)
If PDI score < 4 = No Periodontal disease
If PDI score > 4 = Periodontal disease present.

RESULTS

Incidence of periodontal disease in the present study was found to be 32% (160 positive out of 500 cases).

Table 1: Incidence of periodontal disease

Total cases	Periodontal disease positive	Percentage
500	160	32%

Age Group – no co-relation seen. In 18-25 yrs age group, 85 cases out of total 260 (32.6%) were positive for periodontal disease while in 26-35 yrs age group, 75 cases out of 240 (31.2%) were in age group of 26-35 yrs.

Parity- Periodontal disease was found to be more common in primigravida as compared to P2 and P3

Table 2: Parity- Periodontal disease

Parity	**Group I (PD +ve) n= 160**	**Group II (PD –ve) n= 340**	**P VALUE**
P0	98 (61.2%)	200 (58.8%)	P= 0.5
P1	24 (30%)	100 (29.4%)	DOF=2
P2 and above	7 (8.7%)	40 (11.7%)	

Distribution of cases according to severity of periodontal disease

68% patients were negative for periodontal disease. From 32% of positive cases, 28.6% had mild disease while only 3.4 % had severe disease.

Table 3: Distribution of cases according to severity of periodontal disease

PDI Score	TOTAL NO.	PERCENTAGE
0-3.9	340	68%
4-4.9	143	28.6%
5-6	17	3.4%
TOTAL	500	

Table 4: Overview of Pregnancy complications in relation to periodontal disease

PREGNANCY COMPLICATION	GROUP I PD +VE n=160	GROUP II PD -VE	P Value
PROM	52 (32.5%)	74 (21.7%)	P= 0.0136 (DOF=1)
PPROM	10 (6.2%)	16 (4.7%)	P=0.6104 (DOF=1)
PRE-ECLAMPSIA	14 (8.7%)	6 (1.7%)	P=0.05 (DOF=1)
PRETERM BIRTH	20 (12.5%)	36 (10.5%)	P=0.631 (DOF=1)

Fetal outcome in relation to periodontal disease

There was more no. of IUGR babies in patients with periodontal disease as compared to patients not having periodontal disease.

Table 5: Fetal outcome in relation to periodontal disease

FETAL OUTCOME	GROUP I PD +VE n=160	GROUP II PD -VE n=340	P Value
IUGR	24 (15%)	36 (10.5 %)	P= 0.204 (DOF=1)
STILLBIRTH	4 (2.5%)	12 (3.5 %)	P=0.71 (DOF=1)

Overview of severity of periodontal disease and fetal outcome

There was no linear co-relation between increasing severity of periodontal disease and fetal outcome.

Table 6: Overview of severity of periodontal disease and fetal outcome

PDI Score	IUGR (n=24)	STILLBIRTH (n= 4)
4-4.9	21 (87.5 %)	4 (100%)
5-6	3 (12.5%)	0 (0 %)

DISCUSSION

In the present study, it has been seen that periodontal disease is not related to maternal age. Also, no significant co-relation was seen between socio-economic status and periodontal disease, which is similar to the result of Romero BC *et al.* However, Radani *et al* [1] observed increased incidence of periodontal disease in lower class group.

No co-relation was found between periodontal disease and literacy in the present study nor in the studies by Mookem *et al* [2] and Goepfert AR *et al* [3].

On analysing the dental hygiene habits, in the present study, it was found that brushing of teeth (p=< 0.0001, DOF=2) and rinsing of mouth twice daily (p=< 0.0001, DOF=2) reduced the incidence of periodontal disease, which was consistent with the studies of Budeneli *et al* [4] and Jarjoura *et al* [5].

Significant association was found between periodontal disease and pre-eclampsia which was consistent with the studies by Canakci *et al* [6] and Cota LO *et al* [7]. Srinivas *et al* [8] however did not find any association. In relation to periodontal disease and preterm birth, some authors have found positive association while some have not found any correlation. In the present study, no association between these two variables was found. Positive association was found between PROM and periodontal disease in the present study, which is consistent with that of the studies by Marianne vogt *et al* and Michaele *et al.* No association was found between PPROM and periodontal disease in the present study. This is consistent with the study of Mitchell Lewis *et al* [9] and Rajapaksa KA *et al* [10]. However, Offebacher S *et al* [11] and Bogges KA *et al* [12] found positive association. No correlation was found between periodontal disease and stillbirth ib the

present study which was same as that of the study of ES Davenport et al. However, positive association was found by Mobeen N *et al* and Pitiphat W *et al* [13].

CONCLUSION

As positive association has been found between periodontal disease and PROM, preeclampsia and preterm birth, it can be concluded that early detection and treatment of periodontal disease in young women, preferably before pregnancy will be beneficial, especially for women at risk. Women should be advised to have periodic dental examinations and should be jointly looked after by obstetrician and the dentist. Such treatments during pregnancy is however unlikely to have much effect in reducing the risks. Larger studies with long term follow-up and more well-designed interventional trials are needed however for better understanding of the effects of periodontal disease of mother on feto-maternal outcome.

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