



TO DETERMINE THE PREVALENCE OF PERIODONTITIS AND BACTERIAL VAGINOSIS IN WOMEN WITH PRETERM LABOUR AND THEIR CORRELATION WITH C-REACTIVE PROTEIN LEVELS

Obstetrics & Gynaecology

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ABSTRACT

Introduction: Preterm labour remains a major contributor to perinatal morbidity and mortality worldwide. Inflammatory and infectious conditions such as periodontitis and bacterial vaginosis have been implicated as potential risk factors. C-reactive protein (CRP), an acute-phase reactant, may act as a mediator linking these infections to preterm labour. **Aim:** To determine the prevalence of periodontitis and bacterial vaginosis in women with preterm labour and to assess their correlation with serum CRP levels. **Materials And Methods:** A hospital-based case-control study was conducted in the Department of Obstetrics and Gynaecology, Dayanand Medical College & Hospital, Ludhiana. Two hundred pregnant women were enrolled: 100 women with preterm labour between 26–37 weeks of gestation (cases) and 100 women with term labour beyond 37 weeks (controls). Dental examination was performed using the Community Periodontal Index of Treatment Needs (CPITN). High vaginal swabs were collected for culture, and serum CRP levels were measured. Statistical analysis was performed using SPSS version 21. **Results:** Periodontitis was significantly more prevalent among women with preterm labour, with a higher proportion of cases exhibiting CPITN code 3 and 4 compared to controls ($p = 0.007$). Positive vaginal cultures were observed in 48% of cases versus 18% of controls ($p = 0.01$). Mean serum CRP levels were significantly higher in the preterm labour group (11.51 ± 14.23 mg/L) compared to the term labour group (5.79 ± 5.13 mg/L; $p = 0.001$). **Conclusion:** Periodontitis and bacterial vaginosis are significantly associated with elevated CRP levels in women with preterm labour. Incorporating dental screening, vaginal infection screening, and CRP estimation into routine antenatal care may help reduce the incidence of preterm labour through early detection and timely management.

KEYWORDS

Preterm labour, periodontitis, bacterial vaginosis, C-reactive protein

INTRODUCTION

Preterm birth, defined as delivery before 37 completed weeks of gestation, accounts for approximately 12% of all births and is a leading cause of neonatal morbidity and mortality worldwide (Heaman et al., 2001). Despite advances in obstetric care, nearly half of all cases of preterm labour remain idiopathic, highlighting the need to identify modifiable risk factors (McDonald et al., 1991).

Infection and inflammation are well-established contributors to the pathogenesis of preterm labour. Periodontitis is a chronic inflammatory disease of the supporting structures of the teeth caused predominantly by gram-negative anaerobic organisms. The systemic dissemination of inflammatory mediators, prostaglandins, and endotoxins from periodontal infection may initiate or augment inflammatory pathways implicated in preterm labour (Offenbacher et al., 1998).

Bacterial vaginosis is a polymicrobial condition characterised by disruption of normal vaginal flora and overgrowth of anaerobic bacteria. It has been associated with ascending genital tract infection, chorioamnionitis, and preterm birth (Hillier et al., 1995). Both periodontitis and bacterial vaginosis can stimulate the release of pro-inflammatory cytokines such as interleukins and prostaglandins, which may precipitate uterine contractions and cervical ripening.

C-reactive protein (CRP), produced by the liver in response to inflammation, serves as a reliable marker of systemic infection and inflammation. Elevated maternal CRP levels have been associated with an increased risk of preterm delivery (Hvilsom et al., 2002). This study aims to evaluate the prevalence of periodontitis and bacterial vaginosis in women with preterm labour and to examine their correlation with serum CRP levels.

MATERIALS AND METHODS

This hospital-based case-control study was conducted in the Department of Obstetrics and Gynaecology, Dayanand Medical College & Hospital, Ludhiana, Punjab, India. A total of 200 pregnant women were enrolled after obtaining written informed consent.

Study Groups:

- **Group A (Cases):** 100 pregnant women presenting with preterm labour between 26–37 weeks of gestation.
- **Group B (Controls):** 100 pregnant women presenting with term labour beyond 37 completed weeks.

Inclusion Criteria:

Primigravida or multigravida women with singleton pregnancies presenting with preterm or term labour.

Exclusion Criteria:

Women with medical disorders such as hypertension, diabetes, renal or pulmonary disease; multiple gestation; previous preterm birth; genitourinary infections other than bacterial vaginosis; history of periodontal treatment; uterine anomalies; or therapeutic induction of labour.

Data Collection:

All participants underwent detailed history taking and obstetric examination. Dental examination was performed using the CPITN index. High vaginal swabs were collected under aseptic conditions and sent for microbiological culture. Blood samples were obtained for estimation of serum CRP levels.

Statistical Analysis:

Data were analysed using SPSS version 21. Continuous variables were compared using Student's t-test, while categorical variables were analysed using the Chi-square test. A p-value < 0.05 was considered statistically significant.

RESULTS

The mean age of women in the preterm labour group was 27.79 years, while that of the term labour group was 28.49 years. Both groups were comparable in terms of demographic characteristics.

Periodontal assessment revealed a significantly higher prevalence of advanced periodontitis (CPITN codes 3 and 4) among women with preterm labour compared to controls (p = 0.007) as shown in table 1.

Table 1: Distribution Of CPITN Codes In Study Groups

CPITN Code	Group A (Preterm) n=100	Group B (Term) n=100	p-value
Code 0	20 (20%)	41 (41%)	0.007
Code 1	25 (25%)	25 (25%)	
Code 2	20 (20%)	14 (14%)	
Code 3	20 (20%)	15 (15%)	
Code 4	15 (15%)	5 (5%)	

Vaginal culture positivity was observed in 48% of cases and 18% of controls, indicating a significant association between bacterial vaginosis and preterm labour (p = 0.01) as shown in table 2.

Table 2: High Vaginal Swab Culture Results

Culture Result	Group A (Preterm) n=100	Group B (Term) n=100	p-value
Growth Present	48 (48%)	18 (18%)	0.01
No Growth	52 (52%)	82 (82%)	

The mean serum CRP level in the preterm labour group was 11.51 ± 14.23 mg/L, significantly higher than the control group mean of 5.79 ± 5.13 mg/L (p = 0.001) as shown in table 3.

Table 3: Comparison Of Mean CRP Levels

Parameter	Group A (Preterm)	Group B (Term)	p-value
Mean CRP (mg/L)	11.51 ± 14.23	5.79 ± 5.13	0.001

DISCUSSION

The present study demonstrates a significant association between periodontitis, bacterial vaginosis, and preterm labour. Women with preterm labour exhibited a higher prevalence of periodontal disease and vaginal infection, along with elevated serum CRP levels. These findings support the hypothesis that systemic inflammation may play a pivotal role in the initiation of preterm labour.

Similar associations have been reported in previous studies, where periodontal disease and bacterial vaginosis were identified as independent risk factors for preterm birth (Guimarães et al., 2010; Hillier et al., 1995). Elevated CRP levels further reinforce the inflammatory link between maternal infection and preterm labour.

CONCLUSION

Periodontitis and bacterial vaginosis are significantly associated with elevated CRP levels in women with preterm labour. Early screening and management of these conditions during the antenatal period may help reduce the burden of preterm birth. Collaborative care involving obstetricians and dental professionals is recommended to improve maternal and neonatal outcomes.

Ethical Consideration

The study was approved by the Institutional Ethics Committee of Dayanand Medical College & Hospital, Ludhiana. Written informed consent was obtained from all participants.

Conflict Of Interest

None declared.

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