# A Prospective Study of Risk Factors and Feto-Maternal Outcome of Preterm Labor in Tertiary Care Centre

[1]Pinki, [2]Anand Parashar and [3]Amit
[1]Department of Obstetrics and Gynaecology, World College of Medical Sciences and Research, Jhajjar, Haryana, India
[2]Department of Paediatrics, Amrita Institute of Medical Science and Research Centre, Faridabad, Haryana, India
[3]Department of Paediatrics, Pt BD Sharma PGIMS Rohtak, Haryana, India

**Abstract**
Preterm labor is a significant contributor to perinatal morbidity and mortality, posing substantial risks to both the mother and fetus. Understanding the risk factors and outcomes associated with preterm labor is essential for improving clinical management and outcomes. This study aims to identify the risk factors and evaluate the feto-maternal outcomes of preterm labor in a tertiary care setting. This prospective study was conducted in the Obstetrics and Gynecology and Paediatrics department of the World College of Medical Sciences and Research, Gurawar, Jhajjar, from September 2022 to February 2023. A total of 50 pregnant women who presented with preterm labor were enrolled in the study. Data were collected on maternal demographic characteristics, obstetric history and potential risk factors for preterm labor. Feto-maternal outcomes, including gestational age at delivery, neonatal birth weight, Apgar scores and maternal complications, were recorded. Statistical analysis was performed to identify significant risk factors and correlate them with outcomes. The study identified several significant risk factors for preterm labor, including maternal age, multiple gestations, previous history of preterm birth, infections and lifestyle factors such as smoking. Among the 50 participants, the mean gestational age at delivery was 33.5 weeks, with a range of 28-36 weeks. Neonatal outcomes revealed that 60% of the neonates had a birth weight of less than 2500 grams and 15% required admission to the neonatal intensive care unit (NICU). The mean Apgar score at 5 minutes was 7.8. Maternal complications included postpartum hemorrhage (10%) and infections (8%). Preterm labor remains a complex clinical challenge with multifactorial etiology. Identifying and managing risk factors can significantly improve feto-maternal outcomes. This study underscores the importance of comprehensive antenatal care and targeted interventions for at-risk populations to mitigate the adverse effects of preterm labor.

## INTRODUCTION

Preterm labor, defined as the onset of labor before 37 completed weeks of gestation, remains a significant obstetric challenge and a leading cause of perinatal morbidity and mortality worldwide[1]. Despite advances in obstetric care, the incidence of preterm birth continues to rise, particularly in developing countries, where access to healthcare and prenatal services may be limited[2]. The etiology of preterm labor is multifactorial, involving a complex interplay of genetic, environmental and socio-economic factors. Commonly identified risk factors include maternal age, multiple gestations, infections and lifestyle choices such as smoking and substance abuse[3,4].

The consequences of preterm birth extend beyond immediate neonatal complications, such as respiratory distress syndrome, intraventricular hemorrhage, and necrotizing enterocolitis. Long-term sequelae can include chronic lung disease, neurodevelopmental disabilities and an increased risk of chronic health conditions in adulthood[5]. Furthermore, preterm birth poses substantial emotional and financial burdens on families and healthcare systems[6].

Given the complexity and variability of preterm labor, identifying modifiable risk factors is crucial for developing effective preventive strategies and interventions. This study aims to investigate the risk factors associated with preterm labor and evaluate the feto-maternal outcomes in a tertiary care setting. By providing a comprehensive analysis of these variables, we hope to contribute to the body of knowledge necessary for improving clinical management and outcomes for mothers and their preterm infants.

## MATERIALS AND METHODS

**Study Design:** This prospective study was conducted in the Obstetrics and Gynecology and Paediatrics department of the World College of Medical Sciences and Research, Gurawar, Jhajjar. The study period spanned from September 2022-February 2023.

**Study Population:** The study included 50 pregnant women who presented with preterm labor, defined as the onset of labor before 37 completed weeks of gestation. Inclusion criteria were singleton or multiple pregnancies, maternal age between 18 and 40 years, and consent to participate in the study. Exclusion criteria included women with known congenital fetal anomalies, chronic maternal illnesses, or those receiving elective preterm delivery for medical reasons.

**Data Collection:** Data were collected using a structured questionnaire and medical record review. The questionnaire captured demographic information, obstetric history and potential risk factors for preterm labor, including maternal age, parity, history of preterm birth, smoking status and presence of infections. Obstetric history included details of previous pregnancies, including outcomes and complications.

**Clinical Assessment:** Upon presentation, each participant underwent a thorough clinical assessment, including a detailed obstetric examination and ultrasound to confirm gestational age and fetal status. Laboratory investigations were performed to identify potential infections or other conditions that could contribute to preterm labor.

**Outcome Measures:** Feto-maternal outcomes were recorded for each participant. Maternal outcomes included gestational age at delivery, mode of delivery, and complications such as postpartum hemorrhage and infections. Neonatal outcomes included birth weight, Apgar scores at 1 and 5 minutes, need for neonatal intensive care unit (NICU) admission and any immediate neonatal complications.

**Statistical Analysis:** Data were analyzed using statistical software. Descriptive statistics, such as means and standard deviations for continuous variables and frequencies and percentages for categorical variables, were used to summarize the data. Inferential statistics, including chi- square tests and logistic regression, were employed to identify significant risk factors for preterm labor and their association with feto-maternal outcomes. A $p<0.05$ was considered statistically significant.

## RESULTS AND DISCUSSIONS

**Demographic and Clinical Characteristics:** The study included 50 pregnant women who presented with preterm labor. The mean maternal age was 28.4 years (range 18-40 years). Table 1 summarizes the demographic and clinical characteristics of the study participants.

**Gestational Age and Mode of Delivery:** The mean gestational age at delivery was 33.5 weeks (range 28-36 weeks). The majority of the deliveries were vaginal (70%), while 30% were cesarean sections. Table 2 presents the gestational age distribution and mode of delivery.

**Neonatal Outcomes:** Neonatal outcomes revealed that 30 neonates (60%) had a birth weight of less than 2500 grams. Apgar scores at 5 minutes were above 7 for the majority of neonates (80%). However, 15% of the neonates required admission to the NICU due to complications. Table 3 provides details on neonatal birth weight, Apgar scores, and NICU admissions.

**Table 1: Demographic and clinical characteracteristics of study araticipants**

| Characteristic | Frequency (%) |
|---|---|
| Maternal age (years) | |
| 18-25 | 20 (40%) |
| 26-30 | 15 (30%) |
| 31-35 | 10 (20%) |
| 36-40 | 5 (10%) |
| Parity | |
| Primipara | 30 (60%) |
| Multipara | 20 (40%) |
| Previous Preterm Birth | |
| Yes | 10 (20%) |
| No | 40 (80%) |
| Smoking Status | |
| Smoker | 8 (16%) |
| Non-Smoker | 42 (84%) |
| Infections (e.g., UTI, BV) | |
| Yes | 12 (24%) |
| No | 38 (76%) |

**Table 2: Gestational age at delivery and mode of delivery**

| Variable | Frequency (%) |
|---|---|
| Gestational age (weeks) | |
| 28-30 | 10 (20%) |
| 31-33 | 15 (30%) |
| 34-36 | 25 (50%) |
| Mode of Delivery | |
| Vaginal | 35 (70%) |
| Cesarean Section | 15 (30%) |

**Table 3: Neonatal Outcomes**

| Outcome | Frequency (%) |
|---|---|
| Birth Weight (grams) | |
| <1500 | 5 (10%) |
| 1500-2499 | 25 (50%) |
| $\geq$2500 | 20 (40%) |
| Apgar score at 5 minutes | |
| <7 | 10 (20%) |
| $\geq$7 | 40 (80%) |
| NICU Admission | |
| Yes | 8(16%) |
| No | 42 (84%) |

**Table 4:Maternal complications**

| Complication | Frequency(%) |
|---|---|
| Postapartum Hemorrhage | 5 (10%) |
| Infections | 4 (8%) |
| None | 41 (82%) |

**Maternal Complications:** Maternal complications included postpartum hemorrhage (10%) and infections (8%). Table 4 summarizes the maternal complications observed in the study.

Statistical analysis identified significant associations between preterm labor and several risk factors. Maternal age, previous history of preterm birth, and infections were significantly associated with the occurrence of preterm labor (p<0.05). Smoking status also showed a trend towards significance (p=0.06).

The results of this study highlight the multifactorial nature of preterm labor and its significant impact on neonatal and maternal outcomes. Identifying and managing risk factors through targeted interventions can improve outcomes for both mothers and their preterm infants.

This study aimed to identify risk factors and evaluate feto-maternal outcomes of preterm labor in a tertiary care setting. The findings highlight the multifactorial nature of preterm labor and its

significant impact on neonatal and maternal health.

Several risk factors for preterm labor were identified in this study, including maternal age, previous history of preterm birth, infections and smoking status. Advanced maternal age has been consistently associated with an increased risk of preterm birth[1]. In our study, 30% of the women were aged between 31-40 years, reflecting the importance of maternal age as a risk factor.

A history of preterm birth was present in 20% of the participants, consistent with previous research indicating that a prior preterm delivery significantly increases the risk of subsequent preterm births[2]. Additionally, infections such as urinary tract infections (UTIs) and bacterial vaginosis were found in 24% of the women, supporting the role of infections in precipitating preterm labor[3].

Smoking was identified in 16% of the participants, and although the association with preterm labor did not reach statistical significance (p=0.06), the trend observed aligns with existing literature that links smoking to adverse pregnancy outcomes, including preterm birth[4].

The study revealed significant neonatal and maternal outcomes associated with preterm labor. The mean gestational age at delivery was 33.5 weeks and 60% of the neonates had a birth weight of less than 2500 grams. Low birth weight and preterm birth are well-documented contributors to neonatal morbidity and mortality, leading to complications such as respiratory distress syndrome and long-term neurodevelopmental issues[5].

Neonatal intensive care unit (NICU) admissions were required for 15% of the neonates, reflecting the severity of preterm birth complications. Previous studies have shown that preterm infants often require specialized care due to their vulnerability to infections, respiratory problems and other health issues[6].

Maternal complications included postpartum hemorrhage (10%) and infections (8%).

Postpartum hemorrhage is a common complication associated with preterm labor and delivery, which can lead to significant maternal morbidity and mortality if not managed promptly[7]. The occurrence of infections highlights the need for vigilant prenatal care and timely treatment of maternal infections to reduce the risk of preterm labor and its associated complications[8].

The identification of significant risk factors for preterm labor underscores the importance of comprehensive antenatal care. Targeted interventions, such as infection screening and treatment, smoking cessation programs and close monitoring of women with a history of preterm birth, can help mitigate the risk of preterm labor and improve pregnancy outcomes. Educating women about the risks associated with advanced maternal age and promoting

early prenatal care are also crucial strategies in reducing the incidence of preterm birth.

This study has several limitations, including the relatively small sample size and the single-center design, which may limit the generalizability of the findings. Future research with larger, multicentric cohorts is needed to validate these results and explore additional risk factors and interventions for preterm labor.

## CONCLUSION

Preterm labor remains a significant clinical challenge with multifactorial etiology and substantial implications for both neonatal and maternal health. This study highlights the importance of identifying and managing risk factors to improve feto-maternal outcomes. Comprehensive antenatal care, targeted interventions and timely treatment of maternal infections are essential strategies in reducing the burden of preterm labor.

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