

Study of Incidence and Outcome of Preterm Labor in a Tertiary Care Centre

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Abstract:

Background: Preterm birth remains a major global public health concern and is a leading cause of neonatal morbidity and mortality, particularly in low- and middle-income countries. Despite advances in obstetric and neonatal care, the burden of pre-term labour continues to pose significant challenges in tertiary care settings.

Aim: To study the incidence, maternal risk factors, and perinatal outcomes of preterm labour in a tertiary care center.

Methodology: This hospital-based observational study was conducted at Department of Obstetrics and Gynaecology, Kanti Devi medical College and research Centre, Mathura, Uttar Pradesh, India over a period of one year. A total of 90 pregnant women presenting with preterm labour between 28 and <37 weeks of gestation were enrolled. Data regarding maternal demographics, obstetric characteristics, and neonatal outcomes were collected using a structured proforma and analyzed using standard statistical methods.

Result: Most cases occurred in the late pre-term period. Multigravida women constituted a higher proportion of cases. Low birth weight was common, and a significant number of neonates required NICU admission. Neonatal morbidity remained substantial, while maternal complications were comparatively less frequent.

Conclusion: Preterm labour continues to be associated with significant neonatal morbidity. Early identification of risk factors and strengthened antenatal and neonatal care services are essential to improve perinatal outcomes.

Keywords: Preterm labour, Preterm birth, Neonatal outcome, Low birth weight, Tertiary care.

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Introduction

Preterm delivery, defined as giving birth at 37 weeks gestation, continues to be a significant global public health concern [1]. Particularly in the setting of tertiary care institutions in India, its incidence varies greatly between areas and calls for particular attention. Understanding the risk factors for preterm birth and evaluating the ensuing perinatal outcomes is crucial for optimizing treatment methods in India's diversified healthcare landscape [2]. Preterm birth incidence in India is complicated and multidimensional. According to national data, the country has a high frequency of preterm births, with prevalence rates ranging from around 10% to 14.8%. The country's complex epidemiological picture of preterm birth is influenced by regional differences [3].

Preterm delivery risk factors include a wide range of circumstances. The risk landscape is significantly shaped by maternal age, socioeconomic level, access to healthcare, and nutritional status. The importance of these elements is highlighted in reports from various parts of India, emphasizing the need for a regionally specific inquiry [4]. Preterm delivery

continues to be the most significant clinical issue for obstetricians and pediatricians, resulting in psychological stress for mothers and unclear outcomes for newborns in their early extrauterine lives [5].

Due to the high rates of prenatal morbidity and death as well as long-term consequences such learning difficulties from vision, hearing, and cognitive issues, it is also seen as a significant public health concern [6]. Preterm delivery has significant long-term economic ramifications for society and health care systems, according to economists. However, there is a great clinical dilemma in reducing these serious neonatal adverse outcomes due to diagnostic difficulties in identifying modifiable factors that are amenable to prevention or treatment [7]. A multi-country research conducted in low- and middle-income countries (LMICs) found that preterm newborns are more likely to die and that spontaneous preterm delivery is the most prevalent [8]. Preterm births are becoming more common worldwide, although there is little data from underdeveloped nations like

Ghana. The limited data available indicates that preterm birth rates have increased over the past 20 years in most countries, especially those with low and intermediate incomes [9].

Preterm birth aetiology is further complicated by the wide variations in the incidence of maternal problems, such as gestational diabetes (reported at rates ranging from 7.5% to 15.2%) and hypertensive disorders (reported at rates ranging from 6.6% to 14.5%). This data emphasizes how important it is to look at regional differences in risk variables to tailor treatments [10]. Secondary and tertiary interventions to prevent preterm birth must consider that prolonging pregnancy to promote maturation may also allow continued exposure to a suboptimal or even hazardous intrauterine environment until the various pathways that contribute to preterm parturition are better understood. Preventing preterm birth is, in fact, a surrogate endpoint for optimal foetal, baby, and lifetime health rather than a health result [11]. Preterm neonates are more vulnerable to hunger, chronic diseases, early mortality, and short- and long-mature neurocognitive and motor impairments than term newborns.

Therefore, in the setting of our tertiary care hospital, the main goal of this study was to identify and analyse certain risk factors that contribute to preterm birth and to assess the related perinatal outcomes, including both early and late neonatal problems.

Methodology

Study Design: This was a hospital-based observational study designed to evaluate the incidence, associated risk factors, and maternal and neonatal outcomes of preterm labour among pregnant women attending a Department of Obstetrics and Gynaecology, Kanti Devi medical College and research Centre, Mathura, Uttar Pradesh, India

Study Duration: The study was conducted over a period from April 2022 to March 2023.

Sample Size: A total of 90 pregnant women diagnosed with preterm labour were included in the study.

Sampling Technique: A consecutive sampling technique was used. All eligible patients presenting with preterm labour during the study period and fulfilling the inclusion criteria were enrolled until the required sample size was achieved.

Inclusion Criteria

- Pregnant women presenting with preterm labour (gestational age between 28 and <37 completed weeks)
- Singleton pregnancy
- Willingness to provide informed consent

Exclusion Criteria

- Pregnancies with major congenital fetal anomalies
- Medically indicated preterm deliveries (e.g., severe pre-eclampsia, placental abruption)
- Multiple gestations
- Women with incomplete clinical records

Data Collection: Data were collected using a pre-designed and structured proforma. Information included maternal demographic details, obstetric history, antenatal complications, gestational age at delivery, mode of delivery, and neonatal outcomes. Relevant investigations and clinical findings were recorded from patient case files and labour room records.

Procedure: Patients presenting with signs and symptoms of preterm labour were clinically evaluated. Gestational age was confirmed based on last menstrual period and/or ultrasonography. Standard management protocols for preterm labour were followed as per hospital guidelines. Maternal and neonatal outcomes were monitored until discharge, and details were systematically documented.

Statistical Analysis: Data were entered into Microsoft Excel and analyzed using SPSS software (version to be specified). Descriptive statistics were expressed as means, standard deviations, frequencies, and percentages. Appropriate inferential statistical tests were applied where required, and p-value < 0.05 was considered statistically significant.

Result

Table 1 displays the age-based distribution of women who present with preterm labour. The age group of 26–30 years old had the highest number of cases (37.8%), followed by women in the 31–35 age range (24.4%). Teenage moms (less than 20 years old, 6.7%) and women 36 years of age or older (11.1%) had lower incidences. This suggests that the peak reproductive age group was when pre-term labour was most common.

Age group (years)	Frequency	Percentage (%)
<20	6	6.7
21–25	18	20
26–30	34	37.8
31–35	22	24.4
≥36	10	11.1
Total	90	100

Table 2 illustrates the distribution of cases in accordance with parity. Primigravida women made up 33.3% of instances, while multigravida women made up the majority (66.7%). This highlights

parity as a key factor and implies that preterm labour is more common among women who have had prior pregnancies.

Parity	Frequency	Percentage (%)
Primigravida	30	33.3
Multigravida	60	66.7
Total	90	100

Table 3 shows the gestational age at presentation of preterm labour. 35.6% of the cases were between 31 and 34 weeks of gestation, and almost half (48.8%) were between 35 and 36 weeks. Between 28 and 30

weeks, only 15.6% of instances were documented. This suggests that in the study population, late preterm labour was more prevalent than early preterm labour.

Gestational age (weeks)	Frequency	Percentage (%)
28–30	14	15.6
31–34	32	35.6
35–36	44	48.8
Total	90	100

Table 4 illustrates the mode of delivery utilized by study participants. The most common birth method (71.1%) was vaginal, whereas 28.9% of cases used a caesarean section. This indicates that caesarean

sections should only be performed for obstetric reasons, as the majority of pre-term labour situations might be effectively handled by vaginal delivery.

Mode of delivery	Frequency	Percentage (%)
Vaginal delivery	64	71.1
Caesarean section	26	28.9
Total	90	100

Table 5 illustrates the distribution of neonatal birth weight. 51.1% of the newborns weighed between 1.5 and 2.49 kg, while 13.3% weighed less than 1.5 kg.

35.6% of instances included babies weighing more than 2.5 kg at delivery. This indicates that low birth weight is quite common in premature births.

Birth weight (kg)	Frequency	Percentage (%)
<1.5	12	13.3
1.5–2.49	46	51.1
≥2.5	32	35.6
Total	90	100

Table 6 summarizes the neonatal outcomes. Significant newborn morbidity was indicated by 42.2% of neonates that needed to be admitted to the NICU. Neonatal sepsis occurred in 15.6% of

instances, whilst respiratory distress syndrome was noted in 22.2% of cases. 6.7% of newborns had perinatal death, which is indicative of the negative consequences of preterm delivery

Outcome	Frequency	Percentage (%)
NICU admission	38	42.2
Respiratory distress syndrome	20	22.2
Neonatal sepsis	14	15.6
Perinatal mortality	6	6.7

Table 7 presents maternal complications associated with pre-term labour. 77.8% of women did not have any postpartum problems. The most frequent maternal morbidity was puerperal pyrexia (11.1%),

which was followed by chorioamnionitis (4.4%) and postpartum haemorrhage (6.7%). This suggests that, despite its existence, maternal morbidity was very low in the community under study.

Maternal complication	Frequency	Percentage (%)
Puerperal pyrexia	10	11.1
Postpartum hemorrhage	6	6.7
Chorioamnionitis	4	4.4
No complications	70	77.8
Total	90	100

Discussion

A substantial contributor to long-term negative health consequences, preterm birth is a worldwide epidemic and a major cause of infant death. There is a dearth of published data on preterm births, despite current efforts to lower preterm births and the complications associated with them in developing nations [12]. The lower sample size used in the current study as opposed to a larger sample size may be the reason for the discrepancy in prevalence between the current conclusion and that of earlier research [13].

Additionally, this might be explained by the various methods used to estimate a baby's gestational age. While previous studies collected data retrospectively, our study recruited people who were admitted to the labour ward for delivery. It was noted that the prevalence of preterm birth was as low as 0.5% in 2012 but dramatically grew to 6.0% in 2017 and 9.0% in 2019, despite being significantly lower than the current study. This bolsters the argument that preterm birth is becoming more common, which may explain why the present study's prevalence was greater [14]. About 10% of pre-term deliveries are typically extremely preterm, with the majority of the neonates having the best chance of surviving despite the possibility of serious long-term morbidity. Although the lower limit of defining preterm birth is still up for debate, the study's use of the WHO categorization system is seen as a plus since it allows for direct comparison of particular preterm rates with other institutions both locally and globally. Since the WHO categorization encompasses all live births, its primary drawback is the lack of a defined lower limit for determining preterm birth [15]. The fact that several of the individuals in this analysis had latency periods of less than an hour and were thus excluded by

definition from the current research may account for this discrepancy.

It is important to note that some of these factors, such as maternal hypertension and prenatal care, may be changed. Maternal age under 30, grandmaternity, unmarried status, and underweight were other characteristics that had a strong potential for positive connection, but they did not approach statistical significance. Obesity, maternal hypertension, an unbalanced diet, inadequate prenatal care, and placental previa have been identified as specific risk factors for preterm birth; however, more prospective studies with better methodological quality and power are required in these settings to either confirm or deny these clinically significant etiological associations [16].

Informed consent is the first step in managing PPROM. The patient must be informed about risks and benefits since she will be involved in management decision-making. Prematurity, infection morbidity, and its consequences are among the problems commonly seen in PPROM therapy. Prematurity is the main danger to the foetus, whereas infection morbidity and its consequences are the main hazards to the mother. Although high, the incidence of newborn problems in this research is similar to what has been reported. Rather than PROM, the consequences of premature delivery and the complexity of the Newborn Special Care Unit (NBSCU) may be more strongly linked to this high rate of newborn complications [17].

All things considered, the results of this study confirm that preterm delivery is still a major obstetric and neonatal problem in tertiary care settings. The complex character of preterm delivery and its related consequences is highlighted by the reported maternal and neonatal outcomes, underscoring the need of early detection of high-risk

pregnancies and prompt management. Preterm newborns continue to have significant morbidity despite improvements in prenatal monitoring and neonatal care, highlighting the significance of optimizing both prenatal and intrapartum care. The availability of newborn critical care services, adherence to standard treatment standards, and enhanced institutional protocols may all contribute to the more favorable survival results shown. However, the study's shortcomings, such as its single center design and rather small sample size, limit how broadly the results can be applied. In order to reduce the burden of preterm birth and improve perinatal outcomes, future large-scale, multicentric prospective studies are needed to better clarify region-specific risk factors and create focused preventative methods.

Conclusion

The current study demonstrates that in a tertiary care context, premature labour is still a major factor in poor perinatal outcomes. Multigravida women made up a significant fraction of the afflicted population, and the majority of instances happened during the late preterm period. Despite improvements in obstetric and neonatal care, low birth weight and an increasing requirement for NICU hospitalization were frequent neonatal outcomes, highlighting the fragility of preterm neonates. Neonatal morbidity persisted despite the comparatively low frequency of maternal problems, highlighting the persistent clinical challenge associated with preterm delivery. Improving maternal and newborn outcomes is largely dependent on early risk factor identification, effective prenatal surveillance, and prompt obstetric intervention. Reducing the burden of preterm birth requires strengthening prenatal care services, enhancing referral mechanisms, and guaranteeing the availability of neonatal intensive care facilities. To better understand region-specific risk factors and develop focused preventive interventions aiming at lowering the prevalence of preterm labour and its related problems, more extensive, prospective, multicentric studies are advised.

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