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Original Research Article

Analysis of Preterm Labour and Associated Risk Factors

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Abstract

Background: Preterm birth is a poorly understood field, making it one of the most severe issues pregnant women encounter. Due to the incomplete understanding of the biochemical and molecular causes of preterm birth, numerous authors have shown interest in various risk factors.

Aims: This study was conducted to learn the risk factors for preterm birth and to look into the matter for identifying high-risk mothers.

Methods: In the present study, 50 cases of preterm labour were admitted to Hi-Tech Medical College over two years, and the perinatal mortality and morbidity associated with preterm births were examined.

Results: The majority of patients (62%) were aged 20–24 yrs, and the incidence of PPROM was higher among multigravida (54%) than among primigravida (44%). The most prevalent cause of premature labour was an infection of the lower genital tract or UTI. In 36 cases, a positive vaginal culture was obtained. Positive urine cultures were obtained in 14% of 38 cases, with *E. coli* being the most common (26%). There were significantly more male infants than female infants. The proportion was 1.57 to 1. RDS was the most prevalent complication among newborns (27.8%). The subsequent conditions were septicemia (9.3%), ICH (7.4%), and birth asphyxia (5.5).

Conclusion: Therefore, we can conclude that such risk factors are causing premature births. Planning public education initiatives and considering suitable perinatal care alternatives for women at higher risk for preterm deliveries require understanding these risk factors.

Keywords: Preterm Birth, Prenatal Death, Anaemia, Gestational Hypertension.

Introduction

The World Health Organization (WHO) defines preterm birth as babies born alive before reaching 37 weeks of gestation. [1] It is an important factor contributing to neonatal morbidity and mortality among babies under five. [2] Preterm delivery problems claim the lives of almost 1 million kids every year. [3] Preterm birth affects between 5% and 18% of all babies worldwide. [4] In both developed and developing nations, medically superfluous inductions and caesarean section births before the full term also contributes to an increase in preterm births. In many nations, the actual incidence of premature birth remains unexplained. [5] Malawi had the world's highest reported rate of premature births, with 18.1 cases reported per 100 births. [6] Sub-Saharan Africa and South Asia account for over 60% of the preterm birth worldwide. In India, 3,341,000 babies are born too prematurely, and 361,600 children under five die because of preterm birth complications. [7]

It is also claimed that India accounts for 23.4% of all preterm births worldwide. Preterm birth has an impact on both the mother and the offspring. From the research that has been done, it is clear that mother age, a previous preterm birth, multiple pregnancies, pregnancy-induced hypertension (PIH), prolonged premature membrane rupture (PROM), and urinary tract infections have all been significantly predictive of preterm birth ($p = <0.05$). A preterm birth account for 24.71% of all unfavourable birth outcomes observed and is connected with medical problems such as hypertension, oligohydramnios, and anaemia. [8] Preterm birth risk factors include having severe anaemia and frequent prenatal checkups throughout pregnancy. [9] Inconsistent results have also been observed in other investigations. The aetiology of preterm birth is complex and multifactorial. Thus more research is needed to fully understand it. However, there hasn't been much research done in India to investigate the potential risk factors causing preterm birth. Additionally, most of the literature in print only covers a few specific geographical areas. To create effective control strategies and put preventative measures in place on time, the present review must identify possible and absolute risk factor(s) linked with preterm birth.

In addition to serious issues in obstetrics and paediatrics, preterm labour, preterm delivery, and premature birth also have significant economic, psychological, and societal repercussions. Most currently used preterm birth assessment techniques rely on manual risk grading. These techniques have a 17%–38% prediction rate for preterm birth. This accuracy range is unsatisfactory. According to several experts, manual risk assessment techniques are generally insufficient for predicting premature labour. We need to learn more about the causes, prevention, and treatments of preterm labour and preterm delivery to improve the outcomes of these extremely preterm neonates. But during the past 30 years, the rate of preterm births has not dropped. According to Goldenberg et al., 2008 it is mainly Due to the inability to detect the high-risk group during standard prenatal care. [10] To identify women at risk of spontaneous preterm birth, clinicians use prior preterm birth, multiple pregnancies and prior cervical surgery as major risk factors. Clinical risk factors in predicting spontaneous preterm birth in Nulliparous women with a singleton pregnancy are scant, except for a history of prior cervical surgery. [11]

Materials and Methods

This prospective cohort analysis was conducted between November 2018 and October 2020 at the Hi-Tech Medical College and Hospital. In total, 50 preterm

labour patients with or without membrane rupture were included in the study. A thorough history was obtained. Recordings of demographic parameters were made. In addition, detailed clinical examination findings, routine investigations, and USG were documented. They were hospitalized and monitored until delivery.

Inclusion criteria

- All mothers who presented with preterm labour

Exclusion criteria

- Pregnancy beyond 37 completed weeks of gestation.
- Pregnancy with previous h/o caesarean section for CPD.
- Twin or higher order pregnancy.

Statistical analysis

SPSS was utilized for accurate statistical analysis in this study. Discrete data are given as frequencies and percentages, while continuous data are reported as means and standard deviations. An analysis of variance was used for the statistical analysis in this study. $P< 0.05$ was deemed significant.

Ethical approval

The study procedure was explained to each patient, and consent was obtained. The hospital's Ethical Committee has authorized the research protocol.

Results

The information that is now accessible makes it clear that developing nations like India have a higher prevalence of preterm birth than developed nations. The prevalence of preterm birth in the Indian population is generally very high and is greater than the prevalence rate predicted by the WHO. Most preterm birth studies in India are now concentrated in a few states, and most Indians have not been included in this research. From November 2018 to October 2020, Hi-Tech Medical College & Hospital was the primary location for the available studies.

Table 1: Age-wise distribution of cases and gravida-wise distribution of cases

Maternal age (years)	**Number of cases(N)**	**Percentage (%)**
20 – 24	31	62
25-29	17	34
30-34	2	4
Total	50	100
Gravida	**Number of cases**	**Percentage**
Primi	23	46
Multi	27	54
Total	50	100

Table 1 shows the age-wise distribution of patients in the present study. This study's maternal age associated with preterm labour ranged from 20-34 years. The highest incidence was found in the age group of 20 –24. This table also shows preterm labour details Gravida-wise. The highest incidence was found in multigravida (54%) and the remaining in Primi-Gravida (46%). The previous obstetric history among multigravida included normal labour, preterm labour or a history of 1 to 3 spontaneous abortions. Among these, 14 patients had a previous history of preterm labour.

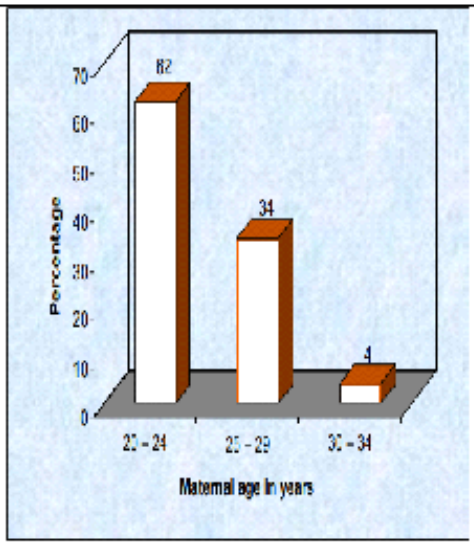

Figure 1: age-wise distribution OF cases

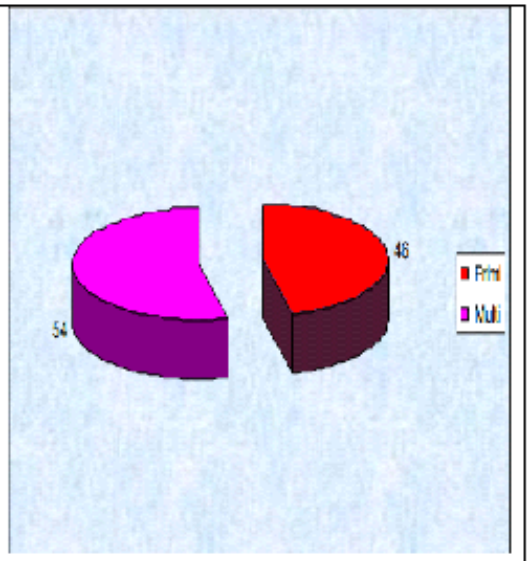

Figure 2: gravida wise distribution of cases

Table 2: Gestational age

Gestational age	Number of patients	Percentage
<28	3	6
28 – 29wks 6 d	3	6
30 – 31wks 6 d	11	22
32 – 33wks 6 d	16	32
34 – 36wks 6 d	17	34
Total	50	100

Table 2 shows the gestational age distribution of patients at the onset of preterm labour. The gestational age in 17 patients was 34-36 wks 6d (constituting 34% of patients); in 16 patients was 32 – 33 weeks 6d (constituting 32%); in 11 patients was 30-31wks 6d (constituting 22%); was 28 – 29 wks6d (constituting 6%), in 3 patients was < 28 weeks (constituting 6%).

Table 3: Chief complaints with which patients in preterm labour present

Complaints	Number	Percentage
Leaking P/V	17	34
Bleeding P/V	7	14
UTI	10	20
Hypertensive disorders	11	22
Labour pains only	5	10

Table 3 shows how a patient with preterm labour presents with various complaints. This table shows that 17 patients came with complete leak P/V, and 2 cases were taken for LSCS given severe oligohydramnios (low BPP). Oligohydraminos were due to leak P/V, and there was no fetal deformation due to oligohydraminos 7 patients who complained of bleeding P/V either due to placenta praevia or abruption placentas. Among 50 patients with preterm labour, 10 patients came with complete UTI. The total numbers of patients with symptoms of PE were 11 in number.

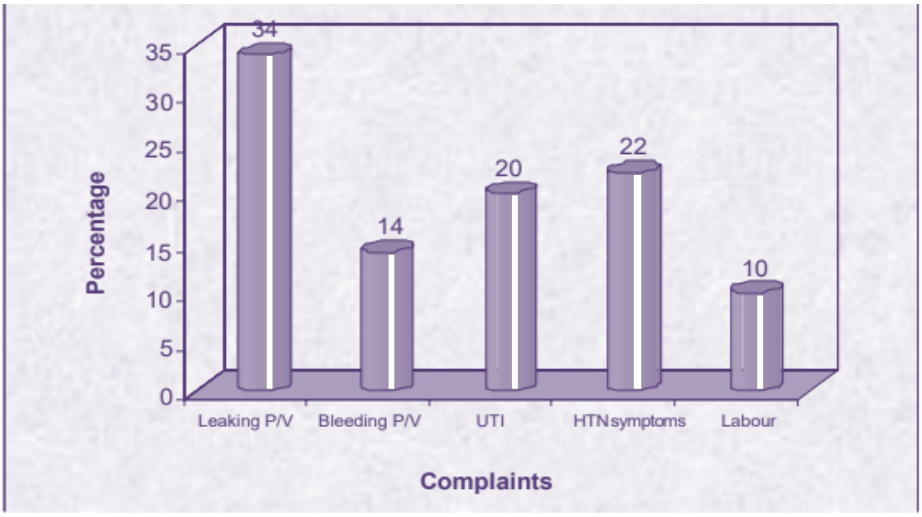

Figure 3: Chief complaints with which patients in preterm labour present

Table 4: Fetal presentation, mode of delivery, neonatal complications and maternal complications

Presentation	**Number**	**Percentage**
Vertex	45	90
Breech	4	8
Transverse /Oblique	1	2
Total	50	100
Mode of delivery	Number	Percentage
Vaginal	8	16
Outlet forceps	5	10
Preterm assisted breech	2	14
LSCS	35	70
	Number	Percentage
RDS revived	13	24.1
RDS death	5	3.7
Septicemia	2	9.3
Birth asphyxia	3	5.5
ICH	4	4.7
Normal (Mother side)	27	50.0
Total	54	100.0
PPH	6	12
Fever	5	10
Nil	39	78

Among the type of presentation, vertex was the commonest. It was seen in 45 patients. 4 were breech, and 1 was transverse /oblique. In the present study, 8 patients were delivered via the vaginal route. 5 out of 50 patients had instrumental delivery (outlet forceps). Preterm assisted breech was 2 in number. The total number of LSCS was 35. Table 4 shows the various neonatal complications in patients with preterm labour. The commonest among them is respiratory distress syndrome (27.8%). This table also shows the incidence of maternal morbidity during the study was 22%. Puerperal rise of temperature was noted in 5 cases.

Table 5: Perinatal Mortality

	Number of cases	Percentage	Number of death	Percentage
Septicemia	2	10	1	50
RDS	18	5	5	27.7
Birth asphyxia	3	10	1	33.3
ICH	4	30	3	75

This table shows the perinatal mortality in preterm labour. There were 10 deaths in the study. 1 case due to septicaemia, 5 cases due to RDS (out of 18 cases), 1 case was due to birth asphyxia and 3 cases due to ICH.

Discussion

Preterm labour and birth are not uncommon and are inversely proportional to maternal weight, age, and socioeconomic standing; the incidence of preterm labour increases. Young patients, particularly those with low gynaecologic age, appear susceptible to preterm labour and have an increased risk of preterm birth. According to Mary L. Hediger, Theresa O. Scholl, Joan I. Schall, and Paul M. Krueger, there is a two-fold risk 102 due to biological immaturity. Preterm deliveries occurred in well below 4% of births among mothers younger than 35, almost half the frequency observed in older mothers (≥35 yrs). [12] Lansac says that the rate of premature births nearly doubles (5.7% of births to women under 35 vs 8.2% to women over 35). This new early birth results from older women having their pregnancies sped up because of health problems. [13] In the current study, as shown in Table 1, most preterm births occur in the 20–24 year age group, whereas only two patients are observed in the 30–35 year age group. The total number of multigravidas in the current study was 27, slightly higher than the total number of primigravidas. This increase was observed because women who have already experienced preterm birth had a 2.5-fold increased risk of doing so during their subsequent pregnancies. Carhill and Hall [14] have shown that in women with a history of one preterm delivery, there is a 15% chance of the next preterm delivery, and after 2 preterm deliveries, there is a 32% chance. Recurrence risk is 17.2% and 28.4%, respectively, after 1 and 2 previous preterm births. [15] This is similar to the present study, with a recurrence rate of 14%.

By gestational age, 5% of preterm births occur at less than 28 wks (extreme prematurity), 15% at 28– 31 wks 6d (severe prematurity), 20% at 32 – 33 wks 6d(moderate prematurity) and 60 – 70% at 34 – 36 wks 6d (near term). [16]

In this study, most preterm babies happen between 34 and 36 weeks, which is 34%, and then between 32 and 34 weeks, which is 32%. Most people in this group had low incomes, and infections of the genital tract and UTIs were the main cause of their problems. Table 4 shows some problems that can happen when labour starts too early. In this study, the problems were oligohydramnios, polyhydramnios, abruption placenta and placenta praevia (bleeding P/V), UTI, and preclampsia. 30% of the cases are leaking. [17] In the present study≈P/V (PROM) is the cause of preterm labour in it is 34%. According to Lyons, premature rupture of membranes is followed by labour within 24 hrs in 50% of preterm patients. [18]

In the current investigation, there were 2 placenta praevia and 5 occurrences of placental abruption. In the current study, 10–12% of premature births are due to ante partum haemorrhage. Authors like Pritchard (1970) showed that placenta praevia was connected with an increased frequency of premature births. [19] Placenta previa is associated with maternal and neonatal complications, including

preterm delivery and postpartum haemorrhage [20]. According to another study, placenta previa significantly contributes to preterm delivery, low birth weight and perinatal mortality. [21] Oligohydraminos in the present study were due to leaking P/V and were not associated with fetal anomalies. [22] Cases of severe oligohydraminos were taken for LSCS due to fetal distress. Polyhydramnios is one of the causes of preterm labour because of uterine overdistension. There were 2 cases of polyhydraminos and no associated anomalies with it.

Romero et al. say that silent bacteraemia is linked to a higher rate of being born early. [23] In this study, 36% of patients had a positive urine culture report, and 32% had a positive vaginal culture report. So, in this study, the main etiology of early labour was an infection. Lamont concludes that infection is to blame in 40% of cases, and the earlier an abnormal colonization of the genital tract is found, the higher the risk of a bad result. [24]

In this study, 11 (22%) of the patients had preeclampsia, which is about the same number as in a full-term birth. Preterm birth is more likely when a mother has a medical condition, like high blood pressure or preeclampsia. These conditions can also cause labour to have to be sped up for medical reasons. [25] The risk of preeclampsia related preterm delivery was 54.4 times higher in women with a previous related preterm delivery than in women with a previous term delivery. [26]

The method of delivery in preterm labour is shown in Table 4. In the current study, vaginal birth was used in 16% of instances, assisted preterm breech delivery in 4% of cases, and LSCS in 70% of cases. The 2 breech cases—one complete breech and the other an extended breech—were delivered vaginally since the patients arrived in advanced labour. The presentation (breech versus cephalic), fetal weight, and gestational age all affect how the preterm foetus is delivered. There has been a 21% to 36% increase in caesarean sections for babies born between 28 and 31 weeks. There is still debate regarding whether to deliver a baby naturally or surgically, particularly when the pregnancy is breech.

The numerous newborn problems are illustrated in Table 5. The current study's incidence of perinatal morbidity is 34% (out of 54 newborns, 2 were twins). Three suffered from birth asphyxia, two from septicemia, and 18 from respiratory distress syndrome. Respiratory distress syndrome was very common. However, in terms of specific instances, ICH mortality was high. Out of 4 cases, 3 died, or 75% of them, and out of 2 cases of septicemia, 1 died, or 55% of them.13 of the 18 infants with RDS were treated with steroids. In the current analysis, RDS accounted for 76% of all morbidity. Comparable to the research done by Sehgal et al. [27], which reported that neonatal hyperbilirubinemia (78%) and RDS (65%) were the common causes of morbidity in extremely low birth weight babies. In cases of septicemia, the mother had a fever with chills and foul-smelling discharge and the latent period was more than 24 hrs in one case.

Neonatal morbidity was much higher in the group that didn't get betnesol (76% vs. 38.8%). Babies who didn't get steroid coverage were more likely to have RDS (56% vs. 22.2%). This is like the work that Singh Uma et al. did. [28] Where neonatal morbidity was significantly high in betnasol uncovered group (52.1% vs 37.5%). Similarly, the incidence of RDS was high in babies without steroid coverage than in those with (26.8% vs10%). [29]

The study's maternal morbidity rate was 20.3%. The rise in temperature throughout puberty was the most typical of all. Five cases (45.5%) with puerperal temperature rises over 100.40C were reported but could

be treated. The study's maternal mortality rate was zero.

Conclusion

The analysis of the current study allows for the following conclusions to be made. Preterm labour is a serious obstetric issue that necessitates early detection, meticulous antenatal monitoring, prompt infection treatment, administration of corticosteroids if the gestational age is less than 34 weeks, or tocolytics to buy time for the development of the lungs, and pelvic examination using strict aseptic technique. It is best to pursue an expectant line of management for patients whose gestational age is fewer than 34 weeks unless they have other difficulties or are in active labour. This can lead to a decrease in the prevalence of RDS, the main contributor to newborn morbidity and mortality. Women in preterm labour are watched for labour progression and fetal well-being for pregnancies at 34 weeks or more. An antibiotic is administered during active labour to lower the risk of neonatal group B streptococcal infection. Neonatal mortality and morbidity are significantly impacted by preterm labour. It elevates a pregnancy to a high-risk position, necessitating both delivery room neonatal resuscitation and, if necessary, admission to a neonatal intensive care unit.

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