

Original research article**Fetomaternal Outcome in Preterm Birth**

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Abstract

Background: Preterm birth is the leading cause of infant morbidity and mortality in the world. It affects not only the immediate neonatal period but also affects infancy, childhood and even adulthood. The aim of the study was to know various associated factors and outcome of preterm delivery and also the neonatal outcome.

Methods: This is Retrospective Observational study conducted on 110 women with preterm birth in obstetrics and gynaecology department at tertiary care hospital from November, 2023 to April, 2024. General physical examination and systemic examination and obstetrical examination was carried out for the participants.

Results: Patients with a history of previous one or more preterm deliveries and abortions have higher chances of recurrence of preterm birth; in this study, they accounted for 20.9% and 17.6%, respectively. There is higher incidence of preterm birth seen in lower socioeconomic class. The commonest obstetrical risk factor in our study was preterm premature rupture of membrane (PPROM) accounting for 23.63% followed by anaemia accounting for 16.36%. Out of total number of live births 42(38.18%) babies required NICU admission. 9.5% neonatal deaths were seen in gestational age 34 weeks to <37 weeks, whereas 20% and 33.34% mortality were seen in 32 weeks to <34 weeks and 28 weeks to <32 weeks of gestation. The most common neonatal complications were Respiratory distress syndrome (32.75%), Septicaemia (18.10%), jaundice (15.52%) and Meconium aspiration syndrome (8.62%).

Conclusions: Preterm labour and birth remain a major cause of perinatal mortality & morbidity in developing countries like India. Proper antenatal care, early detection and correction of risk factors, institutional delivery and good neonatal care facilities can improve the outcome of preterm labour.

Keywords: Preterm labour, fetomaternal outcome

Introduction

Preterm birth is a substantial global health issue with significant consequences to the newborn, family and society ^[1]. Preterm birth is delivery before 37 completed weeks or 259 days of pregnancy since the first day of last menstrual period, it affects nearly 15 million births worldwide and is the leading cause of death in children younger than 5 years, and remains a prominent issue in obstetrics ^[1] with prevalence of 13% in India ^[2].

According to the American College of Obstetricians and Gynaecologists (2021b), births occurring between 34 and 36 completed weeks are considered late preterm and those before 34 completed weeks as early pre term (Martin, 2021) ^[1].

The World Health Organization (2018) defines births before 28 completed weeks as extremely preterm, those from 28 to 32 weeks as very preterm, and from 32 to 37 weeks as moderate to late preterm ^[1].

Gestational age at delivery and the risk of neonatal morbidity and mortality are inversely related. Namely, neonates born in the early-preterm period make up the smallest proportion of births, but these infants experience disproportionately higher rates of prematurity-related complications, including death ^[1].

For preterm babies who survive, the additional burden of prematurity-related disability may affect families and health systems ^[3].

India has the highest number of premature deliveries worldwide, accounting for about 22 per cent of all the premature deaths globally. While the incidence of premature babies varies each year, about 12 to 13 per cent of babies born in India are premature ^[4].

Aims and Objectives

- To study the prevalence of preterm labour.

- To study various associated factors of preterm labour.
- To study fetomaternal outcome in preterm labour in form of morbidity and mortality.

Materials and Methods

This is Retrospective Observational study conducted on 110 women with preterm birth (Gestational age between 28.0-36.6 weeks) in obstetrics and gynaecology department at tertiary care hospital from November, 2023 to April, 2024.

Obstetrical outcome is recorded in terms of gestational age at the time of delivery, duration of labour, mode of delivery-vaginal, assisted vaginal delivery or caesarean delivery, details of neonatal outcome and complications if any.

Fetal outcome is recorded in terms of birth weight, NICU admission and neonatal outcome.

Inclusion Criteria

- Pregnant women with gestational age >28 weeks to <37 weeks, who had spontaneous onset of preterm labour.
- Any patient whose pregnancy was terminated preterm for any maternal or fetal indication.
- Patients who presented with preterm premature ruptured membrane or antepartum haemorrhage.

Exclusion Criteria

- Pregnant women with fetal congenital anomalies.
- Intrauterine fetal death.
- Pregnancy before 28 weeks or equal and beyond to 37 completed weeks.

Results

Table 1: Distribution of Participants According to Demographic Factors

Demographic profile	No. of Cases	Percentage (%)
AGE		
18-20 yrs	11	10%
20-25 yrs	45	40.90%
26-30 yrs	38	34.54%
31-35 yrs	10	9.09%
≥35 yrs	6	5.47%
Gravida		
Primi	46	41.81%
Second	37	33.63%
Third	15	13.64%
Multi	12	10.90%
Gestational age in weeks		
28 to <32	6	6.6%
32 to <34	26	28.6%
34 to <37	78	64.8%
Previous history of :		
Preterm birth	23	20.9%
Abortions	16	17.6%

Most of the mothers 50.90% belongs to 18-25 years of age group and 41.81% of the mothers were primi gravida. Majority of the mothers (64.8%) were late preterm cases (gestational age between 34 to <37 weeks). Only 20.9% of the mothers had previous history of preterm birth. (Table-1)

Table 2: Distribution of Participants According To the Mode of Delivery

Mode of Delivery	No. of patients	Percentage (%)
Spontaneous Vaginal Delivery	42	56.75%
Induced Vaginal Delivery	28	37.84%
Assisted Vaginal Breech Delivery	4	5.40%
LSCS	36	32.73%

More than half of the mothers had vaginal deliveries out of which 56.75% were delivered spontaneously and 37.84% were delivered by induction of labour. Operative deliveries 32.73% were done for other obstetrics indication along with prematurity. (Table-2)

Table 3: Distribution of Participants According to Interpregnancy Interval in Multigravida Patients

Interpregnancy Interval (In Months)	No. of Patients(64)	Percentage (%)
6-11 months	9	14.06%

12-17 months	16	25%
18-23 months	23	35.93%
24-59 months	13	20.31%
>60 months	3	4.68%

35.93% of the mothers had short interpregnancy interval between 18-23 months followed by 25% of the mothers had 12-17 months of interpregnancy interval, which could be a risk factor for preterm birth. (Table-3)

Table 4: Distribution of Participants According To High Risk Factors for Preterm Labour

Risk Factors	No. of Patients	Percentage (%)
Preterm premature rupture of membrane (PPROM)	26	23.63%
Pre Eclampsia	17	15.45%
Twins	6	5.45%
Idiopathic	22	20%
Gestational Diabetes Mellitus	8	7.28%
Anaemia	18	16.36%
Polyhydramnios	2	1.81%
Oligohydramnios	3	2.72%
APH	5	4.54%
Eclampsia	3	2.72%

In present study, most common risk factor for preterm birth was PPRM (23.63%) followed by anaemia (16.36%), Pre eclampsia (15.45%), Gestational diabetes mellitus (7.28%), etc. (Table-4)

Table 5: Association between Gestational age (in weeks) with birth weight and NICU admission

	Gestational age (in weeks)		
	Very Preterm (28 to <32 Weeks) N = 6(100%)	Early Preterm (32 to <34 Weeks) N = 26(100%)	Late Preterm (34 to <37 Weeks) N = 78(100%)
NICU Admission			
Yes	4(66.67%)	15(57.69%)	21(26.92%)
No	0	11(42.30%)	57(73.07%)
Expired Baby	2(33.34%)	3(11.53%)	2(2.56%)
Birth Weight			
<1 kg	2(33.34%)	3(11.53%)	0
1-1.5 kg	3(50%)	6(23.07%)	12(15.38%)
1.6-2 kg	1(16.67%)	8(30.76%)	16(20.51%)
2.1-2.5 kg	0	9(34.61%)	32(41%)
>2.5 kg	0	0	18(23.07%)

In case of very preterm birth 66.67% neonates need NICU admission and almost half of them had birth weight between 1 to 1.5 kg. In case of early preterm birth half of the neonates need NICU admission and 34.61% out of early preterm birth weight between 2.1-2.5 kg. In late preterm birth less than one third of neonates require NICU admission. (Table-5)

Table 6: Neonatal Complications

Neonatal complications	No. of Babies	Percentage (%)
NICU Admission	42	38.18%
Low birth weight	92	79.31%
Very Low birth weight	21	18.10%
Respiratory distress syndrome (RDS)	38	32.75%
Meconium aspiration syndrome (MAS)	10	8.62%
Septicemia	21	18.10%
Neonatal jaundice	18	15.52%
Necrotising enterocolitis (NEC)	2	1.72%
Intraventricular haemorrhage	1	0.86%

In present study majority (79.31%) of the neonates had low birth weight (<2500 gms) followed by 18.10% of the neonates had very low birth weight (<1500 gms), 32.75% of the neonates were complicated with respiratory distress syndrome. (Table-6)

Discussion

In this study, majority of premature birth (50.90%) were in the age group 18-25 years less compare to a

study done by Fernandes *et al.* (67.9%).^[5] Study by Esposito *et al.* suggests that both advanced and young maternal age were associated with an increased risk of preterm birth^[6]. In present study Extremes of age group (i.e. <20 and >35 years of age) accounted for 15.47% of the cases whereas studies done by Fernandes *et al.* and Shetty *et al.* 15.8% and 14.2% respectively^[5,7].

In this study there is higher incidence of preterm birth in Primi gravida 41.81% while multigravidas accounted for 58.19%. The similar findings were observed with the study done by Singh *et al.* where 47% were primigravida and 53% were multiparous^[8]. There is higher incidence of preterm birth in lower socioeconomic class.

In the present study, patients with a history of previous one or more preterm deliveries and abortions were 20.9% and 17.6% respectively. Pandey kiran *et al.* demonstrate 14.4% patients had a previous history of preterm birth and 14.4% had a history of previous abortion^[9].

Majority of patients in this study delivered vaginally 74(67.30%) and operative intervention in the form of LSCS was done in 36(32.72%) no of patients. These operative deliveries were done for other obstetrics indication along with prematurity.

The commonest obstetrical risk factor in our study was preterm premature rupture of membrane (PPROM) accounting for 23.63% followed by anaemia accounting for 16.36%. Pool *et al.* and Singh *et al.* found approximately 30% and 25.9% respectively, of pre-term births associated with rupture of membrane^[8, 10]. Anaemia per se does not lead to preterm labour but if patients with anaemia have complication such as infection it can lead to preterm delivery^[11]. In our study Pre eclampsia accounted for 15.45% of the cases, similar findings were observed in studies done by Shrestha *et al.* at 13.3% and Taskeen *et al.* at 14%^[5, 12, 13].

Out of total number of live births 68(61.81%) babies were healthy which did not require NICU admission and 42(38.18%) babies required NICU admission. Neonatal mortality is 6.36% which is lower as compared to studies done by Singh *et al.* at 12.7% and Singh *et al.* at 21%^[8, 14], as at Tertiary care centre well trained staff and good NICU facility available. 9.5% neonatal deaths were seen in gestational age 34 weeks to <37 weeks, whereas 20% and 33.34% mortality were seen in 32 weeks to <34 weeks and 28 weeks to <32 weeks of gestation. Hence an increased rate of neonatal mortality due to prematurity can to a huge extent is prevented by early detection of preterm labour and timely intervention by administration of tocolytics and corticosteroids.

The most common neonatal complications were Respiratory distress syndrome (32.75%), Septicaemia (18.10%), jaundice (15.52%) and Meconium aspiration syndrome (8.62%). Garg *et al.* observed 84% of neonates requiring NICU admission with complications of jaundice in (30%) of neonates followed by asphyxia (18%) and RDS (16%)^[15]. Chauhan *et al.* also reported higher incidence of jaundice (32.3%), RDS (22.6%) and asphyxia (13.7%) in their study^[16].

Conclusion

Preterm labour and birth remain a major cause of perinatal mortality & morbidity in developing countries like India. This study was conducted to evaluate and analyse the fetomaternal outcome result and recommend preventive measures that can be developed through this study.

Proper diagnosis, early detection and prevention of preterm labour can be done by regular ANC visits. Antenatal check-up helpful in diagnosing patients with risk factors such as previous history of preterm birth, multiple pregnancy, vaginal infections, short cervical length, threatened abortion and medical disorder who need to be identified earlier and can prevent preterm labour with good antenatal care and early intervention will help to reduce the incidence of preterm labour and thereby preventing complications in the newborn, as evidenced by significant association between premature births and low apgar score and low birth weight.

Use of antibiotics, antenatal steroids, tocolytic treatments and cervical cerclage helps in reduction of systemic infections, decrease need for respiratory support in neonate after birth and low rate of NICU admissions in preterm babies.

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