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Original Research Article

A Clinical Study on Maternal and Fetal Outcome in Cases of Preterm Premature Rupture of Membranes

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Abstract

Introduction: Preterm premature rupture of membrane complicates about 2-4% of singleton pregnancies and 7- 20% of twin pregnancies; it is associated with 60% preterm deliveries and 10% of perinatal death. Preterm PROM is an important cause of perinatal morbidity and mortality mainly due to prematurity and its sequelae. Perinatal infection, increased incidence of hyaline membrane disease, intraventricular hemorrhage, sepsis, cord prolapse, umbilical cord compression resulting from oligohydramnios, fetal distress further compromises the outcome and there is increased fetal wastage**.**

Aim and objective: To study maternal and perinatal outcome in patients with preterm premature rupture of membranes

Methodology: The present study on "Maternal and Perinatal outcome in cases of preterm premature rupture of membranes (PPROM)" was conducted in the Department of Obstetrics and Gynaecology, Narayan medical college, sasaram, Bihar. The study group includes patients admitted with PPROM under the Department of Obstetrics and Gynaecology, Narayan medical college, sasaram.

Result: The 72% were healthy. Birth asphyxia was seen in 12% patients, Jaundice in 12 % and septicaemia was seen in 12% subjects. 43.33% subjects were within 2-2.5 kg, (22%) subjects had birth weight less than 1.5 kg, whereas rest 22% had birth weight equal or more than 2.5 kg.

Conclusion: PPROM significantly resulted in an increased risk of preterm deliveries and its associated complication, making it one of the most important causes for perinatal morbidities and mortality.

Keywords: PPROM, Preterm, Low Birth Weight, PPH

Background

Preterm premature rupture of membranes is defined as spontaneous rupture of amniotic membranes before the onset of uterine contractions or prior to the onset of labour after the age of viability and before 37 completed weeks (36weeks+6days) [1]. Preterm premature rupture of membranes (PPROM) occurs in 3% of pregnancies

and is responsible for approximately one third of all preterm births .The incidence of preterm premature rupture of membrane averages from 0.7 to 2.1% and accounts for about 20 to 40% cases of PROM before 37 weeks of gestation.

Preterm premature rupture of membrane complicates about 2-4% of singletonpregnancies and 7- 20% of twin pregnancies, it is associated with 60% preterm deliveries and 10% of perinatal death. Preterm PROM is an important cause of perinatal morbidity and mortality mainly due to prematurity and its sequelae. Perinatal infection, increased incidence of hyaline membrane disease, intraventricular hemorrhage, sepsis, cord prolapse, umbilical cord compression resulting from oligohydramnios, fetal distress further compromises the outcome and there is increased fetal wastage [2].

Maternal morbidity is increased because of chorioamnionitis, unfavourable cervix, dysfunctional labour, and increase in caesarean rates, postpartum hemorrhage and endometritis. The longer the time interval between the rupture of membranes and onset of labour,greater is the risk of ascending infections and chorioamnionitis. This risk may assume grave prognosis in patient undergoing ceaserean section.

Thus, earlier the gestational age at the time of PPROM, longer the latency and more is the complications. In planning the management, several issues need to be considered. Prematurity is the principal risk to the fetus while infectious morbidity is the primary maternal risk. Chorioamnionitis with PPROM is responsible for significant maternal and neonatal morbidity including early onset neonatal sepsis, bronchopulmonary dysplasia, intraventricular haemorrhage and periventricular white matter injury [3].

PPROM is an obstetric conundrum with significant maternal morbidity and neonatal morbidity and mortality, a careful consideration of various factors and individualization of cases is necessary for appropriate management. The present study is undertaken to know the current trends of fetal and maternal outcome associated with PPROM so that increased attention will be diverted to the important causative factors and fetomaternal outcome can be improved

Aims and Objectives

1. To study maternal and perinatal outcome in patients with preterm premature rupture of membranes
2. To find out the maternal and perinatal morbidity and mortality trends in preterm premature rupture of membrane

Materials and Methods

The present study on "Maternal and Perinatal outcome in cases of preterm premature rupture of membranes (PPROM)" was conducted in the Department of Obstetrics and Gynaecology, Narayan medical college, sasaram, Bihar. The study group includes patients admitted with PPROM under the Department of Obstetrics and Gynaecology, Narayan medical college, sasaram

Sample size: 150 patients admitted with PPROM.

Sampling technique: Hospital based Prospective study.

Study period: September 2021 to April 2022

Inclusion Criteria:

All pregnant women with a singleton pregnancy between 28-37 weeks of gestational age with preterm premature rupture of membranes.

Exclusion Criteria:

1. Multiple pregnancies
2. Intrauterine growth restriction
3. Uterine anomalies
4. Foetal anomalies
5. Myoma uteri

6. Hypertensive disorders and pregnancy induced hypertension

A detailed history and clinical examination were performed. In all cases, the diagnosis of PPROM was established by history and sterile pelvic speculum examination showing amniotic fluid trickling from cervix, pad test, routine hematological investigations, urine examination, HVS for C/S, cardiotocograph and obstetric ultrasound examination was performed.

Ultrasonography was done to assess gestational age, growth parameters, presentation, exclusion of congenital anomalies and liquor columns for amniotic fluid index. Conservative management was done in all early PPROM (28weeks to 33weeeks+6days) patients till the onset of spontaneous labour or till the maternal or fetal indication for delivery ensues such as chorioamnionitis, meconium-stained amniotic fluid, abruption, cord prolapse, fetal distress and/or advanced labour on admission. All late PPROM (>34weeks) patients were induced if not getting into spontaneous labour. Patients were hospitalized until delivery & were advised bed rest. Two doses of Betamethasone 12 mg I.M 12 hours apart or Dexamethasone 6mg 12 hrly 4 dosage were given to the mothers<34 weeks to enhance fetal lung maturity. Prophylactic antibiotics were used in all cases for ten days or up to delivery.

Maternal monitoring to detect chorioamnionitis was done by monitoring pulse rate, temperature, abdominal tenderness, color and smell of liquor and fetal tachycardia in C.T.G. Mothers were monitored intrapartum for complications such as abruption, PPH, retained placenta. Neonates with poor APGAR score, prematurity or infection were admitted in NICU for further management and their outcome were studied. Mother and babies were followed up till discharge.

Statistical Analysis

Variables like age, parity, socioeconomic status, duration of pregnancy, mode of delivery, maternal and fetal outcomes are recorded. Value is expressed as prevalence rates. Conventional Chi-square test was used to analyse differences. $P<0.05$ was considered significant. Statistical analysis was performed with SPSS statistical software with all the relevant data compiled and entered.

Result

Table 1: Frequency table of Time between PROM to Admission of study subjects

Time between PPROM to Admission of study subjects	Frequency	Percentage
0-5	51	34
6-11	66	44
12-23	23	15.33
24-47	7	46.7
47-73	3	2

Table 1 indicates the frequency of time between PPROM to Admission of study subjects. It can be viewed from the table that 44% women were admitted to hospital within 6 to 11 hours of PROM. 34% women were admitted within 5 hours of PPROM. Furthermore, 46.7% of women were admitted within 24-47 hours of PPROM. Therefore, it can be interpreted that majority of the women were admitted to hospital at the earliest of PPROM.

Table 2: Frequency table of Latent period of study subjects

Latent period (in hrs)	Frequency	Percentage
0-24	112	74.66
25-72	34	22.67
>72	4	2.67

Table 2 indicates the frequency Latent period of study subjects. It can be viewed from the table that 74.66% women were delivered within 24 hours of PPROM. Only 2.6 % of patients were delivered after 72 hrs and rest of 34% were delivered between 25-72 hrs.

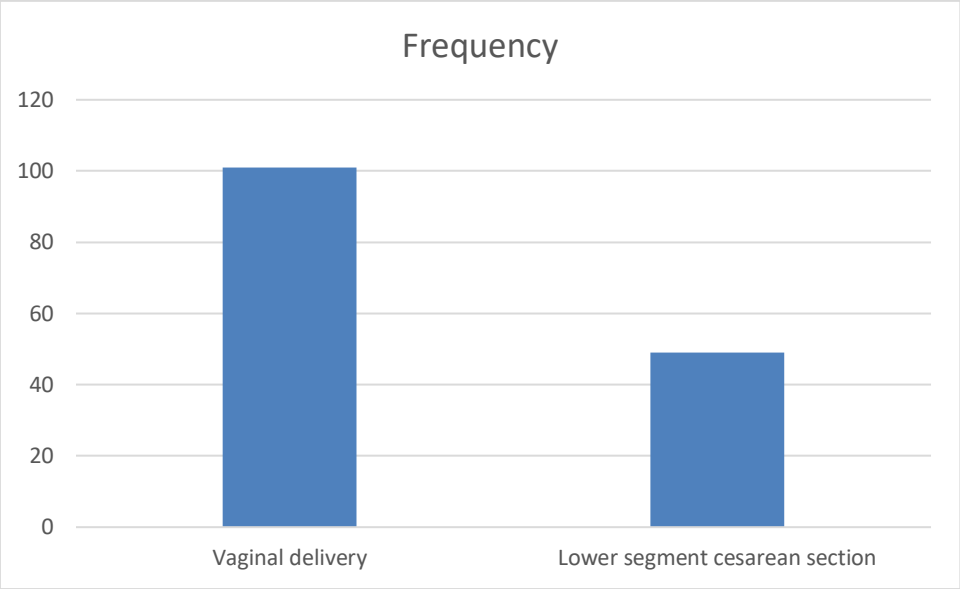

Figure 1: Frequency table of Mode of Delivery of Patients

Table 1 shows Frequency table of outcome of delivery of patients. Majority (67.33%)of the study subjects were delivered vaginally, 32.67% were delivered by LSCS.

Table 3: Frequency Distribution of Bishop Score

Bishop Score	Frequency	Percentage
2-4	66	44
5-7	68	45.33
8-9	16	10.67
Total	150	100

Table 3 illustrates the frequency distribution of bishop score at the time of admission. It can be seen that 44% women had bishop score four and 45.33% women had bishop score 5-7, 10.67% subjects had 8-9.

Table 4: Distribution of Neonatal Morbidity

Neonatal Morbidity	Frequency	Percentage
Healthy	108	72
Birth asphyxia	18	12
Jaundice	18	12
Septicemia	6	4

Table 4 indicates the frequency table of neonatal morbidity. The 72% were healthy. Birth asphyxia was seen in 12% patients, Jaundice in 12 % and septicaemia was seen in 12% subjects.

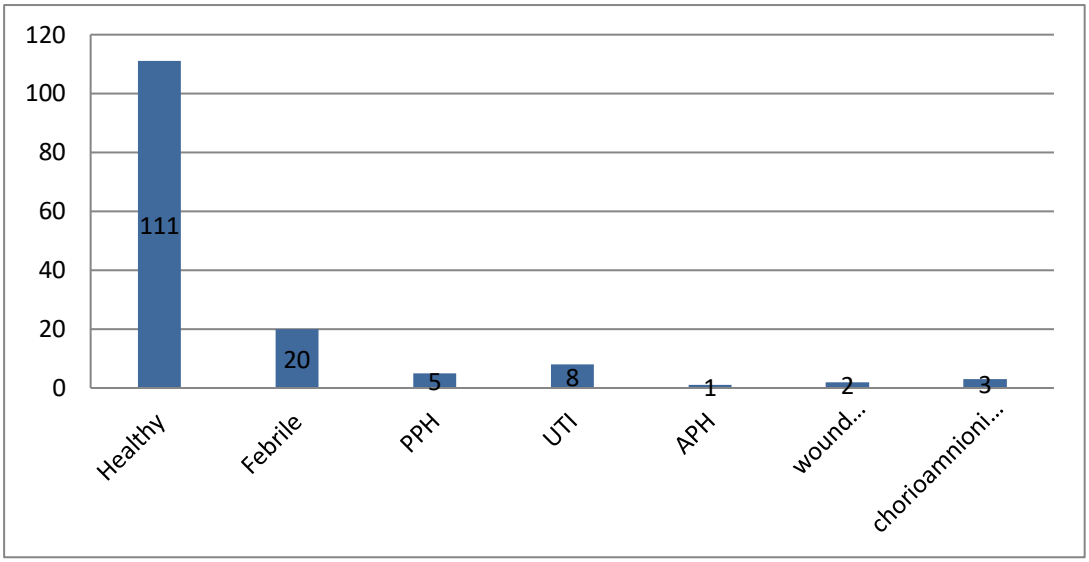

Figure 2: Distribution of Maternal Morbidity

Fig 2 indicates the distribution of maternal morbidity was 10% febrile, 4 % were having UTI, 2.5% had PPH, 1.5% had chorioamnionitis.

Table 5: Frequency table of Birth Weight

Birth weight	Frequency	Percentage
<1.5 kg	33	22
1.5-2.0 kg	19	12.67
2.0-2.5 kg	65	43.33
≥2.5 kg	33	22
Total	150	100

Table 5 shows Frequency table of birth weight. 43.33% subjects were within 2-2.5 kg, (22%) subjects had birth weight less than 1.5 kg, whereas rest 22% had birth weight equal or more than 2.5 kg.

Table 6: Distribution of selected morbidity factor in different group of PPROM

Maternal Morbidity factor	28-31 wk	32-33 wk	34-36 wk
Raised TLC	10	7	17
Raised CRP	14	6	32
Febrile illness	7	3	5
Operative interference	14	7	28

Discussion

A hospital based observational, prospective study was conducted with 150 patients to evaluate the maternal and fetal outcomes in pprom cases. In the present study almost half of the women (46.67%) comes in the age category 26-30 years similar to study of Akter *et al* [4], (40.33%).Our mean maternal age was 26 years in contrast to study of Dr. Beenish Ashraf *et al* (2018) [5] and Dagne Addisu *et al* (2021) [6] where the mean maternal age was found to be 31 years and 29.76 years respectively. This could be due to early age of marraige and childbearing in our locality.

We observed majority (47.33%) study subjects belongs to 34-36 wks 6 days and 30% were in the range of 28-31 wks 6 days and rest 22.67 % belongs to 32-33 weeks 6 days similar to study of Dagne Addisu *et al* (2021) [6] where 69.6% women belonged to gestational age 34–36 weeks and rest 30.4% to 29–33 weeks.

In the present study 46.7% of women were admitted within 24-47 hours of PPROM, 44% within 6 to 11 hours of PPROM and 34% within 5 hours similar to study of study by Umed Thakor duration was 12.06±6.04 hours and 16 hours.

In our study majority of the women(74.66%) women were delivered within 24 hours of PPRO Msimilar to the study of Shweta Patil *et al*.[7] (64%) and also in a study conducted by Russels (80%) [8]. Only 11% had a latent phase of >3days, 28.5% delivered within 25-72 hours in my study which also correlated with the above-mentioned studies.

In a study by Dr Fahmida Sultana *et al* (2019) [9] mean time interval of onset of rupture membrane and delivery was 27.60 hours with a standard deviation of ±21.128hours. In a study by Jain Nikita *et al* (2017) [10] mean time of delivery after admission to the hospital was 37.13 ± 17.431 hours in patients with PPROM.

In the present study, The most common organisms were Enterococcus fecalis (18%), Escherichia coli (12%), Staphylococcus aureus (12.66%), Staphylococcus haemolyticus (6.66%) and Candida albicans (4.66%) almost similar to study of Swathi Pandey [11]. The commonest organism isolated by Swathi Pandey [11] and Kamala Jayaram [12] where most common organism was E. coli, Staphylococci, Streptococci and Atypical coliforms.

In the present study 10% were febrile, 4 % were having UTI, 2.5% had PPH, 1.5% had chorioamnionitis, 1% had wound infections. In a study by Dagne Addisu *et al* (2021) [6], V. Dusingizimana *et al* (2019) [13], maternal morbidity corresponds to, UTI (20%), UTI (18%) and Febrile (14%) respectively.

We observed 44% are study subjects with CRP positive and 56% are CRP negative. In a study by Dr. Beenish Ashraf *et al* (2018) [5] and Swapna Mohana *et al* (2018) [14] showed 32 patients (24%) and 11 cases had elevated CRP respectively.

In the present study 43.33% subjects were within 2-2.5 kg, (22%) subjects had birth weight less than 1.5 kg, whereas rest 22% had birth weight equal or more than 2.5 kg. These results obtained were nearly similar to the results in the study by Kathrin Hanke *et al* (2015) [15] the mean birth weight of infants born to mothers with PPROM was 1045 grams.

We observed study 33.33% neonates were admitted to NICU which correlated with Shweta Patil *et al* [7] showing 36%. In the present study 72% were healthy. Birth asphyxia was seen in 12% patients, Jaundice in 12 %, septicaemia was seen in 4% of the subjects and 3.33 neonatal death. In studies by Céline Petit *et al* (2018) [16] 10%, 2.1% neonatal deaths and 24% of neonates developed respiratory distress, 25% had sepsis, 10% had birth asphyxia, 19% had neonatal jaundice, 3% had NEC, 0.5% had IVH and 2% had congenital pneumonia respectively. By Swapna Mohana *et al* (2018) [14] severe RDS (43%) and sepsis (24%) showed 15% mortality among neonates

Conclusions

On the basis of our study Overall, Hence, PPROM significantly resulted in an increased risk of preterm deliveries and its associated complication, making it one of the most important causes for perinatal morbidities (including preterm births, low birth weight, poor Apgar scores at birth, increased NICU admission rates, need for intubation and neonatal complications) and mortality.

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