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ORIGINAL ARTICLE

Maternal and Neonatal Outcomes of Pregnancy with Preterm Premature Rupture of Membranes

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ABSTRACT

Background: Preterm premature rupture of membranes is a critical condition which can lead to negative maternal and fetal outcomes.

Objective: To assess the maternal and neonatal outcomes of preterm premature rupture of membranes in pregnant women.

Study Design: Retrospective study.

Place and Duration of Study: Department of Gynaecology & Obstetrics, Shifa International Hospital, Faisalabad from 1st March 2023 to 31st July 2023.

Methodology: Ninety pregnant women who suffered from preterm premature rupture of membranes were enrolled. A complete detail of their medical record until delivery and neonatal outcomes were studied and analyzed. All those women's records having preterm premature rupture of membranes (between 24 weeks to 36 weeks) were included in this study. The age of pregnant women included was within 18-45 years. The negative outcomes of the preterm premature rupture of membranes in maternal and neonates were recorded.

Results: The mean age of the pregnant women was 27.5±3.9 years with the mean gestational age as 31.2±3.3 weeks at the time of membrane rupture. Around 42% of the pregnant women were primigravida with majority having a normal body mass index (24.9±3.5 kg/m2). About 17.7% of the women suffered from chorioamnionitis followed by 7.7% suffering from endometritis and 6.6% with wound infection. There were 5.5% women having placental abruption while 2.2% has sepsis developed in them. The neonatal outcomes presented a mean birth weight value as 1841±426 grams of neonates with low birth weight observed in 48.8% neonates. The Apgar score <7 at 5 min, was observed in 15.5%. There were 60% neonates who were initially admitted in the NICU with a mean NICU stay as 12.2±6.8 days.

Conclusion: Preterm Premature rupture of membranes is significantly associated with preterm gestational age and negative outcomes of maternal and neonatal health including, Sepsis, chorioamnionitis, placental abruption, wound infection as well as low birth weight, sepsis, respiratory distress and morbidity in the neonates respectively.

Keywords: Maternal, Fetal outcome, Pregnancy, Preterm premature rupture

INTRODUCTION

Within the various gynecological issues presented all over the world, the preterm rupture of the membrane remains as a highly critical issue all over the globe. The preterm neonates born in such condition are at high risk of respiratory distress and poor prognosis, sepsis, and low birth weight. PPROM is considered as rupture of membranes between 24 to 36 weeks. This can lead to creation of emergency situations ending in cesarean section.[1-4]

A considerable incidence of preterm premature rupture of membranes (PPROM) has been observed in various parts of the world including developing countries like Pakistan. The incidence is related with 13-60% of those women who may develop complication as chorioamnionitis, septicemia, wound infection and placental abruption resulting in maternal and fetal distress.[5-7]

In the present study the maternal and neonatal outcomes of pregnancy with preterm premature rupture of membranes was observed. The results of this study provided and evident input on negative outcomes related to this scenario. These results play a pivotal role in assessing the outcomes and henceforth prevent such events from occurring for maternal and neonatal wellbeing.

MATERIALS AND METHODS

This retrospective study was conducted at Department of Gynaecology & Obstetrics, Shifa International Hospital Faisalabad from 1st March 2023 to 31st August 2023. A total of 90 pregnant women who suffered from preterm premature rupture of membranes were included in this study. A complete detail of their medical record until delivery and neonatal outcomes was studied and analyzed. The sample size of the study was generated by using 80% power of test, 95% CI and 5% margin of error. All those women record having preterm premature membrane rupture (between 24 weeks to 36 weeks) were included in this study. The age of pregnant women included was within 18-45 years. The study was initiated post ethical clearance through ethical clearance committee of the hospital. Complete information regarding the socioeconomic and clinical history of patients was recorded. The biochemical analysis details, anthropometric measurements, medical details until neonatal follow-up till 1 week was documented. Women having multiple pregnancies with fetal anomalies, chronic hyperthyroidism/hypertension were excluded from the study. The clinical investigation retrieved included complete blood count, C-reactive protein, high vaginal swab for culture, and urine culture reports. Maternal body mass index, vital signs assessment, sepsis, chorioamnionitis signs (presence of maternal fever ≥38°C) as well as negative outcomes (maternal tachycardia (>100 beats/min), fetal tachycardia (>160 beats/min) were documented.), Uterine tenderness, as well as vaginal foul-smelling discharge, white blood cell count >15,000 cells/mm³were recorded. The fetal-negative outcomes including respiratory distress, low birth weight (≤2500g), sepsis and neonatal intensive care unit (NICU) stay were also recorded. All the analytical interpretations were made on the basis of the negative material and neonatal outcomes. Data was analyzed in terms of mean, standard deviations for the numerical variables while it was interpreted in terms of frequency and percentage for the categorical variable using SPSS version 26.0.

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RESULTS

The mean age of the pregnant women was 27.5±3.9 years with the mean gestational age as 31.2±3.3 weeks at the time of membrane rupture. 42% of the pregnant women were primigravida with majority having a normal body mass index (24.9±3.5 kg/m^2). Around 10% of the women suffered from previous preterm premature rupture of the membrane (Table 1). Majority of the

pregnant women belonged to the Low socioeconomic class (52%) while only 12% were from a high socioeconomic class (Fig. 1).

There were 55.5% of the cases which had vaginal delivery while 44.5% had cesarean delivery. Within the various cases indicated for the cesarean section 50% were having fetal distress, while 24% had malpresentation and 14% failed induction (Table 2).

The maternal outcomes of pregnancy with PPROM presented a mean latency period as 8.3 ± 4.4 days with 22.2% of the cases having latency period <48 hours. About 17.7% of the women suffered from chorioamnionitis followed by 7.7% suffering from endometritis and 6.6% with wound infection. There were 5.5% women having placental abruption while 2.2% has sepsis developed in them (Fig. 2).

Table 1: Demographic characteristics of enrolled pregnant women (N = 90)

Variables	Value
Maternal age (years)	27.5±3.9
Mean gestational age membrane rupture time (weeks)	31.2±3.3
Primigravida	38 (42.2%)
Multigravida	52
BMI (kg/m²)	24.9±3.5
Previous pre-term birth	14 (15.5%)
Previous preterm premature rupture of the membrane	9 (10%)

Table 2: Indications for caesarean

Characteristic	No.	%
Fetal distress	25	50.0
Malpresentation	12	24.0
Failed induction	7	14.0

Table 3: Neonatal outcomes of preterm premature membrane rupture pregnancy

Neonatal Outcomes	Value
Birth weight (g)	1841±426
Low Birth weight	44(48.8%)
Apgar score <7 at 5 min	14 (15.5%)
Admission inNICU	54 (60.0%)
Mean NICU stay (days)	12.2±6.8

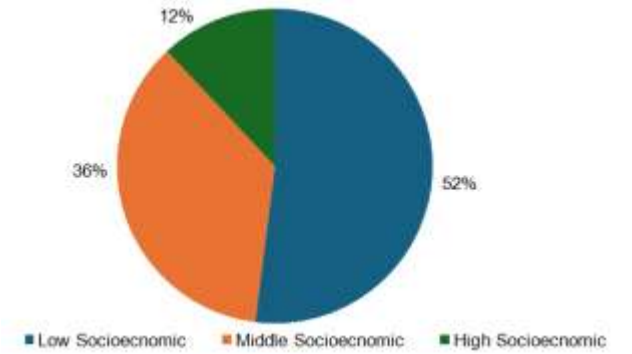

Fig. 1: Frequency of various socioeconomic classes of enrolled pregnant women

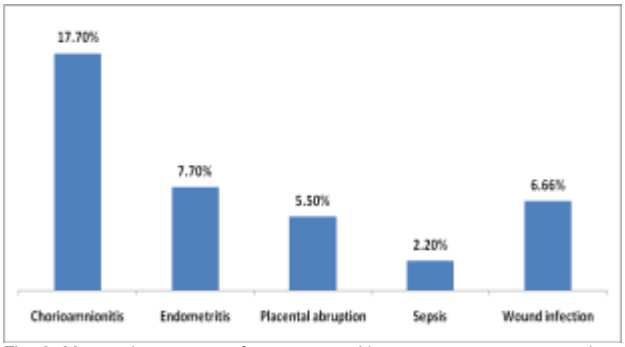

Fig. 2: Maternal outcomes of pregnancy with preterm premature membrane rupture

The neonatal outcomes presented a mean birth weight value as 1841± 426 grams of neonates with low birth weight observed in 48.8% neonates. The Apgar score <7 at 5 min, was observed in 15.5%. There were 60% neonates who were initially admitted in the NICU with a mean NICU stay as 12.2±6.8 days (Table 3). The neonatal respiratory distress syndrome complication was observed in 35% with early onset of sepsis in 20%, necrotizing enterocolitis 5.5%, intraventricular hemorrhage in 7.7% and neonatal mortality in 3.3% cases (Fig. 3).

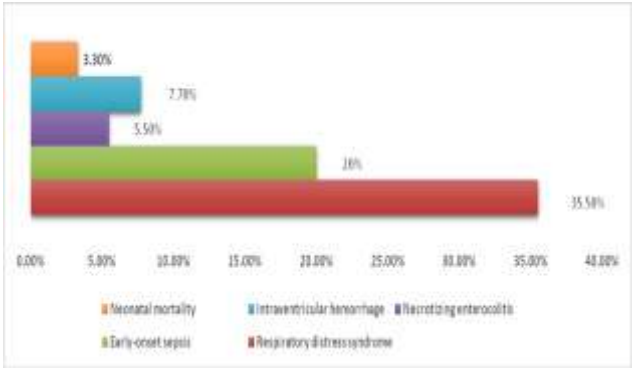

Fig. 3: Neonatal complications in cases of preterm premature rupture of membranes

DISCUSSION

Preterm premature rupture of membranes is a common condition related to pregnancy and can cause maternal and neonatal negative outcomes including mortality of the neonate. The maternal complications, including the operative protocol criticalities, and a wound infection have been reported in various studies over the globe. Preterm or pre-labor membrane rupture occurs in 2% of all births with neonatal low birth weight reported due to early labor.[11-13] The current study results were in coordination with the previously reported research in terms of maternal and neonatal outcomes.

In the present study, there were 42.2% pregnant women with primigravida, while another study reported 17% of primigravida cases. The current study reported a higher number of primigravida due to earlier marriages and low socioeconomic status to be highly prevalent among the study participants. The mean age of the patients recorded in this study was also lower (27.5±3.9 years) than the one reported in literature (30±3.1 years). The variance may be associated with the ethnic differences.[14-17]

The chorioamnionitis was presented in 3-5% of pregnant women having preterm premature membrane rupturing. In cases where prolonged rupture is linked with prematurity the incidence of sepsis escalates to 4-6% and can further lead to neonatal mortality.[15,16] The present study reported 17.7% of the women suffered from chorioamnionitis followed by 7.7% suffering from endometritis and 6.6% with wound infection. There were 5.5% women having placental abruption while 2.2% has sepsis developed in them. Neonatal mortality was observed in 3.3% of the neonates. The similar results were reported by Denoble et al.[18] It has been reported that preterm premature rupture of membranes to be associated with maternal infections and placental abruptions as well as intrapartum neonatal distress.[19,20]

CONCLUSION

Preterm premature rupture of membrane is significantly associated with preterm gestational age, low socioeconomic status and negative outcomes of maternal and neonatal health including, sepsis, chorioamnionitis, placental abruption, wound infection as well as low birth weight, sepsis, respiratory distress and morbidity in the neonates respectively.

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