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Original Research Article

Maternal and perinatal outcome in preterm premature rupture of membranes

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ABSTRACT

Background: Preterm premature rupture of membranes (PPROM) occurs in 3% of pregnancies and is responsible for approximately one third of all preterm births. Objective of present study was to analyse the maternal and perinatal outcome of PPRM patients between 28 to 36 weeks +6days

Methods: A descriptive study was conducted on 141 antenatal patients between 28 to 36weeks+6days with PPRM admitted to Department of Obstetrics and Gynecology, Government TD Medical College, Alappuzha, Kerala, India from September 2014 to September 2015. After establishing the diagnosis of PPRM patients were monitored and Maternal and perinatal outcomes were studied.

Results: 77% patients had late PPRM. 60% of early PPRM latency period >24 hrs and were managed conservatively till 34 weeks. 18% had chorioamnionitis and immediate termination of pregnancy. 73% of newborns in this group needed admission due to complications of prematurity like RDS (54.54%). Perinatal mortality (2.12%) was due to sepsis. 80% of late PPRM had latency period <24 hrs and only 4% had chorioamnionitis. 18.5% babies in this group had hyperbilirubinemia. There was statistically significant association between latency period and perinatal complications ($p=0.001$). RDS was 33% in latency period <24hrs, 18% in >24hrs and sepsis was 36% in >24hrs and 10% in <24hrs.

Conclusions: The most common cause of perinatal mortality in early PPRM is prematurity and its complications. Hence conservative management to prolong pregnancy is recommended under strict monitoring for evidence of chorioamnionitis. At the earliest evidence of chorioamnionitis termination irrespective of gestational age is warranted. In late PPRM, perinatal outcome is good. So, termination is advised as conservative management shall add to the fetal and maternal morbidity due to sepsis.

Keywords: Chorioamnionitis, Latency period, Maternal outcome, Perinatal outcome, Sepsis

INTRODUCTION

Preterm premature rupture of membranes (PPROM) occurs in 3% of pregnancies and is responsible for approximately one third of all preterm births (Bartfield 1998; Goldenberg 1998).^{1,2} 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. Jayaram et al analysed 100

patients with PROM between 32-40 weeks, and found the incidence of PROM to be 7.71% (69% term and 31% PPRM).³

Although 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, particularly because it is associated with brief latency from membrane rupture to delivery, perinatal infection, and umbilical cord compression due to oligohydramnios.

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). Latency period is the time interval between the rupture of the membranes and the onset of uterine contractions. Kappy and Khupel defined PROM as rupture of the membranes with atleast 2 hours of latent period before active labour.⁴ The membranes may either rupture at term (>37 weeks) when it is called term PROM or before 37 weeks of gestation when it is referred to as preterm PROM (PPROM).

PPROM is associated with increased risk of chorioamnionitis, unfavourable cervix, dysfunctional labour, increase in caesarean rates, postpartum hemorrhage and endometritis in mother. In fetus increased occurrence of hyaline membrane disease, intraventricular hemorrhage, sepsis, cord prolapse, fetal distress and increased fetal wastage. 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 proportions in patient undergoing cesarean section. Thus, earlier the gestational age at the time of PPRM, longer the latency and more the complications.

In planning the management of PPPROM, several issues need to be considered. Prematurity is the principal risk to the fetus while infectious morbidity is the primary maternal risk. Chorioamnionitis with PPRM is responsible for significant maternal and neonatal morbidity including early onset neonatal sepsis, bronchopulmonary dysplasia, intraventricular haemorrhage and periventricular white matter injury. PPRM 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.

Objective of present work was to study the maternal and perinatal outcome in women admitted with preterm premature rupture of membranes (PPROM), between 28weeks and 36weeks+6days, in labour room of Obstetrics and Gynecology Department, in Govt. T.D. Medical college Alappuzha, Kerala from September 2014 to September 2015.

METHODS

It is a descriptive study conducted at Government TDMC Alappuzha. Samples were those who got admitted with PPRM in labour room between 28weeks and 36weeks+6days. The diagnosis of PPRM was

established by history, sterile pelvic speculum examination showing amniotic fluid trickling from cervix, pad test. Ultrasonography was done in each case to assess gestational age, growth parameters, presentation, exclusion of congenital anomalies and liquor columns for amniotic fluid index. USG was done mainly in those patients who were treated conservatively.

Conservative management was done in all early PPRM (28weeks to 33weeks+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 PPRM (>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 were given to the mothers <34weeks to enhance fetal lung maturity. Prophylactic antibiotics were used in all cases for ten days or up to delivery (whichever is later) to reduce the risk of infection. Maternal monitoring to detect chorioamnionitis was done by monitoring pulse rate, temperature, abdominal tenderness, color and smell of liquor and cardiotocography C.T.G.

Mothers were monitored intrapartum for complications such as abruption, PPH, retained placenta. Neonates with poor APGAR score or infection were admitted in IBN (in born nursery) for further management and their outcome were studied. Mother and babies were followed up till discharge. 141 cases were studied, data analyzed and expressed in its frequency and percentage.

RESULTS

Of 141 patients studied, 77% had late PPRM and 23% had early PPRM (Table 1). 94.32% were singleton pregnancies, 4.25% twins, 1.04% triplets (Table 2).

Table 1: Distribution of early and late PPRM.

	%
Early PPRM	23
Late PPRM	77

Table 2: Distribution of singleton and multiple pregnancies in study population.

	%
Singleton	94
Twins	4
Triplets	25

The early PPRM was common in 26 to 30 yrs, whereas late PPRM in 21 to 25 yrs (Table 3). Most of them fall under lower socioeconomic status. Almost all were booked cases. Most of the PPRM patients in the present study were primigravida 63.12% (Table 4). Both early and late PPRM were common among primigravida.

Table 3: Age distribution.

Age	%
<20yrs	11
20-25yrs	41
25-30yrs	31
30-35yrs	13
>35yrs	4

Table 4: Distribution of obstetric score in study population.

Obstetric score	%
Primi	63.12
G2	32.62
G3	4.25

Majority of PPROM in multigravida were associated with no significant past obstetric history, those with past history 29% had abortion, 13% had PPROM, 10% had preterm delivery.

Table 5: Distribution of latency period.

Latency period	Early PPROM	Late PPROM
<24hrs	40%	80%
>24hrs	60%	20%

60% of early PPROM (28weeks-33weeks 6days) and 20% of late PPROM (34weeks-36weeks 6days) had prolonged latency period (>24hrs) (Table 5). The induction rate was more common in patients with prolonged latency period. Most of the early and late PPROM patients delivered vaginally, only 21% had LSCS. The most common indication for primary LSCS in PPROM was malpresentations, followed by fetal distress and failed induction.

Table 6: Distribution of maternal morbidity.

Maternal complications	Early PPROM	Late PPROM
Chorioamnionitis	18%	4%
Abruption	6%	0%
No complications	76%	96%

Most of patients in early and late PPROM had no complications. Complications like chorioamnionitis and abruption were observed in patients with prolonged latency period. Of 60% of early PPROM with prolonged latency 18% had chorioamnionitis and 6% had abruption, 20% of late PPROM with prolonged latency 4% had chorioamnionitis (Table 6) of the babies born out of PPROM 59% were males, 41% were females.

About 73% of newborn in early PPROM 27% late PPROM needed IBN admission because of prematurity and associated complications. The mean birth weight of babies in early PPROM was 1.8kg and in late PPROM

was 2.45kg. In early PPROM common complication were RDS and sepsis accounting for 54.54% and 12.12% respectively (Table 7).

Table 7: Distribution of perinatal morbidity.

Perinatal complications	Early PPROM	Late PPROM
Sepsis	12.12%	3.70%
RDS	54.54%	9.25%
NEC	6%	0%
Hyperbilirubinemia	24.24%	18.51%

In the present study RDS was 33% in <24 hrs, 18% in >24 hrs, sepsis was more about 36% in >24 hrs and 10% in <24 hrs, Hyperbilirubinemia was 46% in <24 hrs, 45% in >24 hrs, NEC was 3% in <24 hrs and no NEC in >24hrs.

Table 8: Latency period VS perinatal morbidity.

Perinatal complications	Latency <24hrs	Latency >24hrs
Sepsis	19%	3.70%
RDS	54.54%	9.25%
NEC	6%	0%
Hyperbilirubinemia	24.24%	18.51%

The cause of mortality in the present study was sepsis. All of them were between 28 weeks-29 weeks and latency period of <24 hrs (Table 8). Sepsis was the cause of neonatal mortality in our study (Table 9).

Table 9: Perinatal mortality.

Gestational age	Latency period	Birth weight	Cause of mortality
29weeks	12hrs	1.3kg	Sepsis, pulmonary hemorrhage
28weeks	6hrs	1kg	Sepsis, DIC
28weeks	5hrs	1kg	Still born

DISCUSSION

In present study 41% were between 21-25yrs of age. In a study by Noor S et al in Ayub Medical College in 2006, 58.8% were in the age group of 21-25yrs.⁵ Among 141 patients, 67% of them belong to lower socioeconomic status. In a study done by Sheela et al 68.2% were under lower socioeconomic group.⁵ Among the total study population 63.12% were primigravida. In a study conducted by Gandhi M et al 60.7% were primigravida, another study by Sheela et al majority were primigravida 42.3%, another study by Okeke et al majority were primigravida 29.1%.⁵⁻⁷ In present study 48% of multigravida had no significant past history. 29% had abortions, 13% had PPROM. In a study by Revathi et al 17% had previous abortion, 10% had previous PPROM.⁸ Another study by Sheela et al 29% had previous preterm deliveries, in the present study 10% had previous preterm deliveries.⁵

In our study 60% of early PPRM and 20% of late PPRM had prolonged latency period. Singal S et al study showed 56% of early PPRM and 20% of late PPRM had prolonged latency.⁹ In a study by Gunvat et al 44% of late PPRM had prolonged latency.¹⁰ In early PPRM 70% had vaginal delivery, 30% underwent LSCS, in late PPRM 81% vaginal delivery and 19% LSCS. In a study by Sheela et al 65% had vaginal 15% had LSCS, Biwas T et al 72% had vaginal 16% had LSCS. In the present study 40% of LSCS were among indicated deliveries, a study by Jenny et al showed 18.8% LSCS rate in indicated deliveries.¹¹ LSCS rate were high in the present study because according to our institution protocol breech presentations were not kept for vaginal delivery.

Chorioamnionitis was more common in indicated deliveries as they had prolonged latency period and they were prone to infection during this period. In a study by Bryden et al also showed 67% of chorioamnionitis among early PPRM were in indicated delivery.¹² Another study by Jenny et al showed 1.6% of chorioamnionitis in late PPRM.¹¹ In the present study (16%) had abruption in early PPRM, no abruption in late PPRM.

Major neonatal morbidity noted in our study was RDS contributing to 54.5% followed by 24.2% by hyperbilirubinemia, 12.1% by sepsis, and 6% by necrotizing enterocolitis. RDS is more common in early PPRM and hyperbilirubinemia was more common in late PPRM. A study by Emeche et al showed 61% RDS, Singal S et al obtained 92% RDS in early PPRM.¹³ A study by Emeche et al showed 22% RDS, 17.8 hyperbilirubinemia, and 16% sepsis.¹³ Similar study by Singal S et al, in late PPRM showed 6.6% RDS, 16% sepsis and 25% NEC. In present study, 9.2% had RDS, 18.5% had hyperbilirubinemia, 3.7 % had sepsis.

In present study, RDS was more common in patients who delivered within 24 hrs, and sepsis was common in patients who had prolonged latency period. 33% had RDS, 2.5% had NEC and 10% had sepsis in patients whose who delivered within 24 hrs. In a Similar study by Singal S et al, 46.6% had RDS, and 25% had NEC.⁹ Among patients who had prolonged latency period of more than 24 hrs, 18% had RDS 36% had sepsis, and 0% NEC. In a similar study by seema et al, 33.3% had RDS and 50% had NEC. Perinatal mortality was 2.12% in this study, whereas 7.6% mortality in a study by Seema et al. Early PPRM mainly contributes to perinatal mortality. Sepsis was the main cause of perinatal mortality.

CONCLUSION

Present study concluded that most common maternal morbidity associated with PPRM was chorioamnionitis, that of neonatal morbidity was prematurity and its complications. In current study, of the patients with PPRM most of them were between 21-25years. Incidence of PPRM was more common in

primigravidas. Most multigravida had no significant past obstetric history, of those with past history most of them had abortions. More women had spontaneous delivery, inductions were common in late PPRM. Most of the patients delivered vaginally, LSCS were done commonly for malpresentations like breech, followed by fetal distress and failed inductions.

Common maternal morbidity observed in present study was chorioamnionitis. It was more common among the patients with prolonged latency and induced deliveries. Perinatal morbidity observed in our study were due to prematurity and not the PPRM per se. commonest complication encountered was RDS which was more common in early PPRM. Other complications like neonatal jaundice, sepsis was more or less equally common among early and late PPRM.

Sepsis was more common in patients with prolonged latency period, also contributes to perinatal mortality, whereas RDS was more common in patient with short latency period.

In early PPRM conservative management to prolong pregnancy is recommended under strict monitoring for evidence of chorioamnionitis. At the earliest evidence of chorioamnionitis termination irrespective of gestational age is warranted. In late PPRM termination is advised as conservative management shall add to the fetal and maternal morbidity due to sepsis

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