FOETOMATERNAL AND NEONATAL OUTCOME OF PRETERM PREMATURE RUPTURE OF MEMBRANES

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ABSTRACT

BACKGROUND

Preterm premature rupture of membrane is defined as rupture of foetal membrane before onset of labour at less than 37 completed weeks of gestation. Incidence of PPROM is around 3-10% of all deliveries. Primary complication for mother is infection and for foetus and neonate is prematurity, foetal distress, cord compression, deformation, pulmonary hypoplasia, necrotising enterocolitis and neurologic disorders. Most likely outcome is preterm delivery within 1 week.

The aim of the study is to study the foetomaternal and neonatal outcome in PPROM patients and the common prevalent organism in PPROM.

MATERIALS AND METHODS

This is a cohort study of pregnant women from 24-37 weeks with PPROM admitted to IMCH for a period of 1 year, January 2016 to December 2016. 100 patients with PPROM were taken up for the study. The data was collected using the following inclusion and exclusion criteria. Inclusion criteria are gestational age 24-37 weeks confirmed by dates, clinical examination and ultrasound with lack of uterine contractions for at least 1 hour from PPROM; single live pregnancy in vertex presentation; PPROM confirmed by direct visualisation, neonates admitted in NICU soon after delivery.

RESULTS

49% of patients with preterm premature rupture of membranes were from 18-24 years.68% of patients had a latency period of <1 week and 4% of patients had a latency of 2-3 weeks and 10% of patients with latency of >3 weeks.15% of patients had maternal tachycardia, 4% had tenderness of uterus and 4% had leucocytosis and 14% had an elevated CRP. Thus, clinical chorioamnionitis was seen in 14% of patients, 38% of babies born had prematurity and 2% had sepsis and 19% had respiratory distress syndrome and hyperbilirubinaemia, 2% had perinatal asphyxia, 2% had anomalies, 1% had necrotising enterocolitis and 5% were NND. Common organisms were normal flora, E. coli, Streptococci and Enterococci.

CONCLUSION

PPROM increases the incidence of maternal morbidity with longer hospital stay due to chorioamnionitis. Neonatal morbidity is increased due to prematurity and prolonged neonatal ICU care is needed. Common organisms grown in culture were normal perineal flora.

KEYWORDS

Preterm Premature Rupture of Membrane, Foetomaternal Outcome, Chorioamnionitis.

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BACKGROUND

Preterm premature rupture of membranes is defined as rupture of foetal membranes prior to the onset of labour at less than 37 weeks of gestation. PPROM affects approximately 3-10% of pregnancies and accounts for 25-33% of all preterm births.[1] PPROM thus affects up to one third of all preterm births and confers serious maternal risks, including intra-amniotic infection and an increased risk of neonatal complications.

As the gestational age decreases, the severity and frequency of associated foetal and neonatal complications also increases. Maternal complications are typically

secondary to the increased likelihood of infection associated with PPROM.

Studies have shown that there is a strong association between PPROM and infection (Gomez et al, 1997; Mercer et al, 2003). The management approach to PPROM includes the administration of antibiotics to increase the latency and to reduce risk from prematurity, expectant management until a foetal or maternal condition arises that warrants delivery.

Administration of antibiotics forms a part of standard care of management of PPROM. Antibiotics are found to help in continuation of pregnancy and also to decrease the foetal and neonatal morbidity. Antibiotics decrease the inflammatory response and also prevent the invasion of ascending microbial agents from the genital tract.

The most frequent consequence of PPROM is preterm delivery. In over 50% of patients diagnosed with PPROM, delivery occurs within a week of membrane rupture.[2]It is associated with significant maternal risks including chorioamnionitis with serious systemic infections and neonatal morbidity and mortality, including prematurity, sepsis and pulmonary hypoplasia.

Women with intrauterine infection have a shorter latency period than non-infected women and babies born with sepsis have a fourfold increase in mortality rate compared to babies without sepsis. As with preterm labour, postnatal survival following PPROM is directly related to gestational age at delivery and birth weight.

There is an evidence demonstrating an association between ascending infection from the lower genital tract and PPROM. In patients with PPROM, about one-third of pregnancies have positive amniotic fluid cultures and studies have shown that bacteria have the ability to cross intact membranes.

Diagnostic and therapeutic goals of management of patients with PPROM focus on a reduction in neonatal morbidity. Clinical chorioamnionitis is present in around14% of pregnancies complicated by PPROM[2] with subclinical infection being considerably more common.[3] The current understanding of the contribution of infection and inflammation to the morbidity associated with preterm birth strengthen the notion that intrauterine infection is an indication for delivery.

Primary outcome of PPROM is preterm delivery and primary complication is maternal intrauterine infection with its associated foetal, neonatal and maternal morbidity and mortality. Though high vaginal swab culture is done for all PPROM patients at the time of admission, its role in changing the outcome is less studied. So, this study is intending to see the role of high vaginal swab culture in improving foetal, neonatal and maternal morbidity and mortality.

The aims of the study are-

1. To study the foetomaternal and neonatal outcome in preterm premature rupture of membranes.
2. To study the common prevalent organism in PPROM.

MATERIALS AND METHODS

A cohort study of 100 pregnant women from 24-37 weeks with PPROM admitted to Institute of Maternal and Child Health for a period of 1 year from January 2016 - December 2016 were taken up for the study.

Detailed workup including history, general examination, obstetric examination and relevant specific investigations are done. High vaginal swab culture and sensitivity was done at the time of admission and all patients with PPROM were started on injection ampicillin 2 g IV q.6h.x 48 hrs. followed by Tab. Erythromycin. Patients were continued on erythromycin for 7 days if high vaginal swab culture showed normal flora and swab culture was done weekly. Appropriate culture sensitive drugs were started accordingly when culture was positive for any pathogenic organisms. Foetomaternal and neonatal outcome was studied.

Inclusion Criteria

- Gestational age 24-37 weeks confirmed by dates, clinical examination and ultrasound.
- Lack of uterine contractions for at least 1 hr. from PPROM.
- Single live pregnancy in vertex presentation.
- PPROM confirmed by direct visualisation.

Exclusion Criteria

- Gestational age >37 weeks.
- Women in labour or with uterine contractions within 1 hr. of rupture of membrane.
- Previous caesarean section.
- Malpresentations, multiple gestation and foetal congenital anomalies.
- Intrauterine growth restriction.

Statistical Analysis

Data was analysed in SPSS 16 software using frequency and percentage.

RESULTS

100 patients with preterm premature rupture of membranes from 24 weeks up to 37 weeks were taken up for this study(Chart 1). Regarding the age distribution of patients, 49% of patients with preterm premature rupture of membrane were from 18-24 years of age followed by 37% from 25-30 years. According to the gravidity, 67% of patients were primigravida. Depending on the gestational age, majority were 34-37 weeks (Table 2).Based on the high vaginal swab culture results, normal flora constituted approximately 95% (Chart 2).Maternal lab evaluation revealedthat4% had leucocytosis and 14% had raised CRP (Chart 3). With the advent of better antibiotics, proper inpatient care, genital hygiene, maternal and foetal outcome has improved remarkably(Chart 5).68% of the patients had a latency period of less than 1 week (Table 1, 3). 10% had more than 3 weeks. Regarding the birth weight, around 48% were more than 2kg (Chart 4).

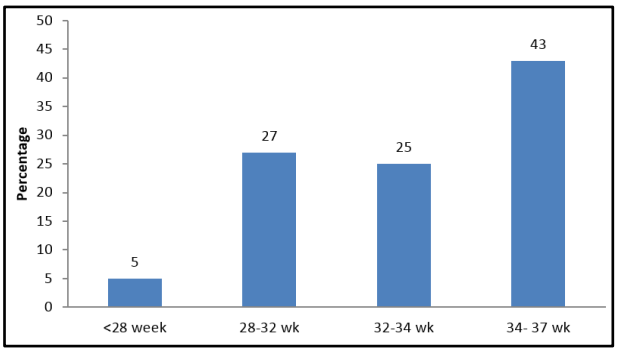

Chart 1. Gestational Age at PPROM

Majority were 34-37 weeks.

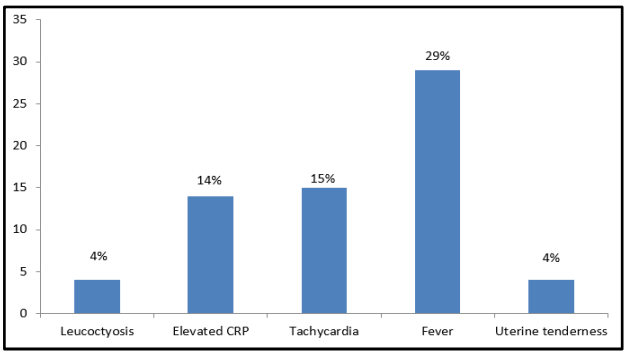

Chart 3. Maternal Complications

4% of the patients had leucocytosis. 14% had raised CRP.

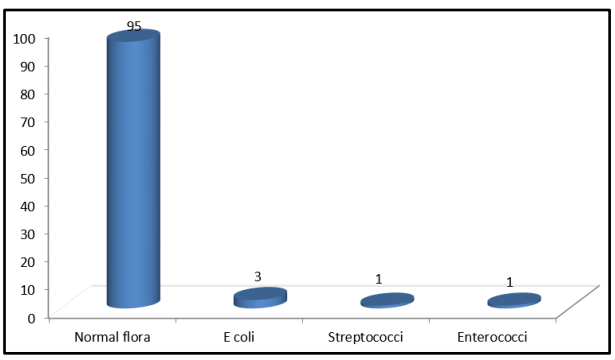

Chart 2. High Vaginal Swab

Normal flora constituted approximately 95%.

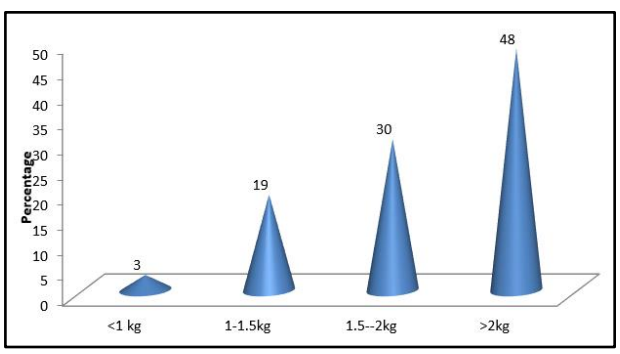

Chart 4. Birth Weight

Around 48% were more than 2kg.

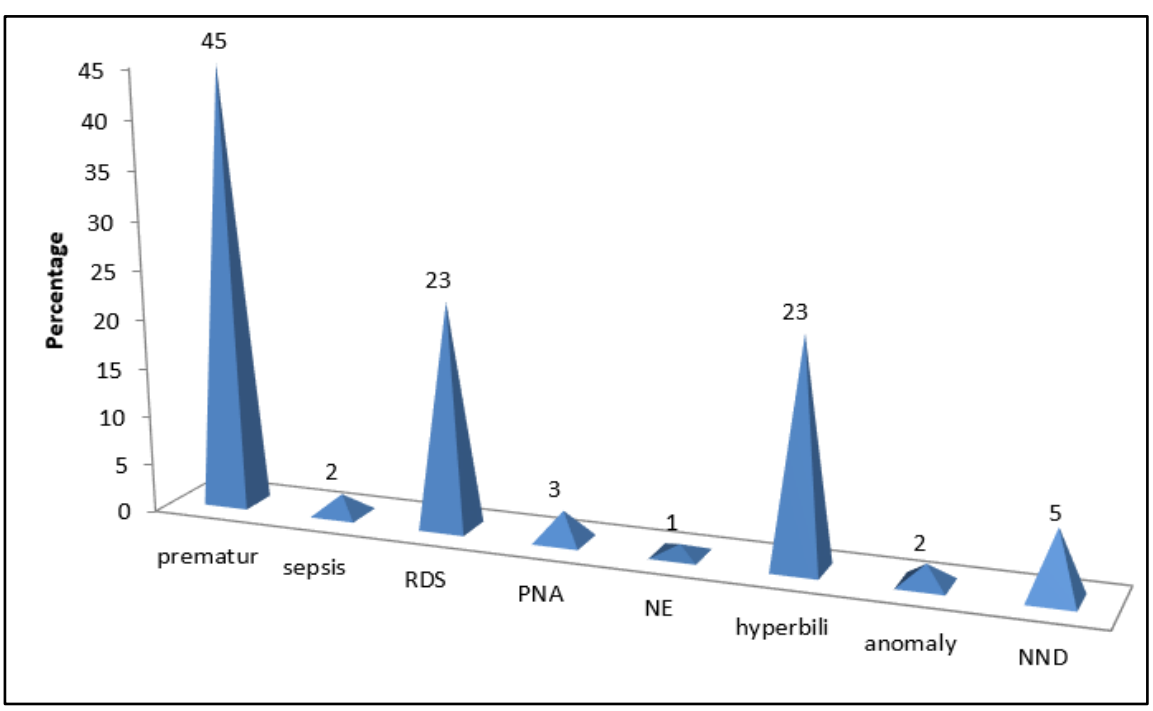

Chart 5. Neonatal Outcome

Latency(Weeks)	N.Flora	E.Coli	Streptococci	Enterococci	Total
<1	68	0	0	0	68
1-2	18	0	0	0	18
2-3	4	0	0	0	4
>3	5	3	1	1	10
Total	**95**	**3**	**1**	**1**	**100**

Table 1. Latency and Organism in High Vaginal Swab

Gestational Age at PPROM (Weeks)	Foetal Outcome		Total
	Live	IUD	
<28	4	1	5
28-32	25	2	27
32-34	24	1	25
34-37	43	0	43
Total	**96**	**4**	**100**

Table 2 Gestational Age at PPROM and Foetal Outcome

With the advent of better antibiotics, proper inpatient care, genital hygiene, maternal and foetal outcome has improved remarkably.

Latency (Weeks)	Parity		Total
	Primi	Multi	
<1	48	20	68
1-2	13	5	18
2-3	3	1	4
>3	3	7	10
Total	**67**	**33**	**100**

Table 3. Relation between Latency and Parity

DISCUSSION

Preterm premature rupture of membranes is associated with serious maternal, foetal and neonatal morbidities and mortality. PPROM is a common cause of spontaneous preterm birth. The management approach to PPROM for women <34 weeks gestation includes the administration of antibiotics to increase latency and to reduce risk from prematurity, expectant management until a foetal or maternal condition arises that warrants delivery.

Although, the pathophysiology of PPROM is multifactorial, infection and inflammation are often responsible for both the initial event of rupture of membrane and also the subsequent sequelae. Clinical chorioamnionitis has been reported to occur in around 14% of pregnancies complicated by PPROM with subclinical infection being more common.

Chorioamnionitis may present shortly after PPROM or at a longer interval and result in preterm labour and maternal symptoms suggestive of infection. Chorioamnionitis also poses direct foetal risks and is associated with increased risk for neonatal morbidity.

As PPROM involve loss of barrier to ascending infection from vagina, prolonged latency is an independent risk factor for neonatal sepsis. Once clinical chorioamnionitis develops, our aim should be prompt and early delivery under antibiotic coverage. But, early induced or spontaneous delivery following intrauterine infection poses the risk of prematurity and other neonatal complications including sepsis to the baby and prolonged neonatal ICU admission.

Expectant management maybe continued up to 34 weeks, if there are no signs of clinical chorioamnionitis and high vaginal swab culture sensitivity is normal and corticosteroids can be given during this time.

PPROM is more commonly seen in primigravida than in multigravida. This correlates with the study of Aktheret al.[4] The study had related sexual activity and genital tract infection as the cause of PPROM.

48% of primigravida had a latency period of <1 week, which shows that primigravida had a shorter latency period than multigravida. Of the 100 patients in the study, induction was done in 19% and 75% had spontaneous onset of labour pains and 6% had undergone direct LSCS for obstetric indications.

15% of patients had maternal tachycardia, 29% patients had fever, 4% had tenderness of uterus, 4% had leucocytosis and 14% had an elevated CRP. Thus, clinical chorioamnionitis is seen in 14% of patients, which is comparable to the study by Varner and Galasak.[5]

2% of patients had postpartum wound infection and 29% had fever in the postpartum period. Gibbs and Blanko[6] had reported an incidence of 6-29% incidence of postpartum infection, 45% of babies born had prematurity, 2% had sepsis, 23% had respiratory distress syndrome and hyperbilirubinaemia, 3% had perinatal asphyxia, 1% had necrotising enterocolitis, 2% had anomalies,[7]4% had intrauterine foetal demise and 5% had neonatal death.8% of babies did not need ICU admissions.69% of patients had no complications. Chorioamnionitis seen in 14% of patients.[8]

CONCLUSION

In PPROM, chorioamnionitis increases the incidence of maternal morbidity. Intrauterine infection increases the risk of foetal and neonatal morbidity and mortality. Neonatal morbidity is increased and prolonged neonatal ICU care is needed in babies born to PPROM mothers. Common organisms grown in culture were normal perineal flora followed by E. coli and streptococci and enterococci. Prolonged latency had increased the maternal and neonatal morbidity.

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