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Original Research Article

A study of perinatal outcome in preterm premature rupture of membranes

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ABSTRACT

Background: Preterm premature rupture of membranes is defined as rupture of fetal membrane before onset of labour at less than 37 completed weeks of gestation and after 28 weeks of gestation. Incidence ranges from 3-10% of all deliveries. Preterm premature rupture of membrane is one of the important causes of preterm birth can result in high perinatal morbidity and mortality. Preterm premature rupture of membranes complicates 3% of pregnancies and leads to one third of preterm birth. Preterm delivery affects one in 10 birth in USA and even greater birth in developing continues and causes 40-75% neonatal death. There are numerous risk factors for preterm premature rupture of membrane such as maternal, socioeconomic class, infection at early gestational age and associated co-morbid condition. Both mother and fetus are at greater risk of infection after preterm premature rupture of membrane. The fetal and neonatal morbidity and mortality risks are significantly affected by severity of oligohydrominos, duration of latency and gestation at preterm premature rupture of membrane. The objective is to study perinatal outcome in preterm premature rupture of membrane.
Methods: This is a prospective study conducted in Mahathma Gandhi Memorial Government Hospital attached to K. A. P. V. Government Medical College, Trichy, Tamil Nadu, India. This is a tertiary health centre. This study has been conducted from January 2018 to June 2018.
Results: Incidence of PPROM ranges from 3.0-10.0% of all deliveries. PPROM complicates approximately 3% of pregnancies and leads to one third of preterm birth.
Conclusions: In present study most of newborn had better 5min Apgar especially late preterm group. In present study RDS was common in early preterm group and hyper bilirubinaemia common in late preterm group. In current study most of patients delivered vaginally compared to 36% of LSCS.

Keywords: Hyaline membrane disease, Neonatal morbidity, PPROM, RDS

INTRODUCTION

Preterm premature rupture of membranes is defined as rupture of fetal membrane before onset of labour at less than 37 completed weeks of gestation and after 28 weeks of gestation.[1] Incidence ranges from 3-10% of all deliveries. Preterm premature rupture of membrane is one of the important causes of preterm birth can result in high perinatal morbidity and mortality. Preterm premature rupture of membranes complicates 3% of pregnancies and leads to one third of preterm birth.

Preterm delivery affects one in 10 birth in USA and even greater birth in developing continues and causes 40-75% neonatal death.[2] There are numerous risk factors for preterm premature rupture of membrane such as maternal, socioeconomic class, infection at early gestational age and associated co-morbid condition. Both

mother and fetus are at greater risk of infection after preterm premature rupture of membrane.[3]

The fetal and neonatal morbidity and mortality risks are significantly affected by severity of oligohydrominos, duration of latency and gestation at preterm premature rupture of membrane.[4] Complication of preterm premature rupture of membrane for the fetus and newborn consist of prematurity, fetal distress, altered pulmonary development leading to pulmonary hypoplasia, pulmonary hypertension, necrotizing enterocolitis and neurological disorder. The treatment relies on accurate diagnosis and gestational age is dependent.

The diagnosis of preterm premature rupture of membrane is made by a combination of clinical suspicious, patient history and some simple test.[5] Any evidence of infection, fetal distress and cord accidents is an indication for delivery. A gestational age approach to therapy is important and should be adjusted to each hospital neonatal care unit. Antenatal antibiotics and steroids have clear benefits and should be offered to all women without complication.[6]

The management of patients with preterm premature rupture of membrane has changed markedly in the past several years. The basis for this is a combination of better understanding of newborn physiology, improved neonatal care and the widespread use of fetal monitoring.

An important recent advance is the recognition that an active observation of program is associated with less morbidity and mortality. Moreover, advances in perinatal and antenatal care will continue to improve the outcomes of these of these women and their children.[7]

The objectives of this study are to study risk factors associated with preterm premature rupture of membrane; to study perinatal morbidity and mortality associated with preterm premature rupture of membrane; to study perinatal morbidity and mortality associated with preterm premature rupture of membrane and to study the outcome of labour in preterm premature rupture of membrane.

METHODS

This is a prospective study conducted in Mahathma Gandhi Memorial Government Hospital attached to K. A. P. V. Government Medical College, Trichy, Tamil Nadu, India. This is a tertiary health centre. This study has been conducted from January 2018 to June 2018.

Inclusion criteria

- All pregnant women with a singleton pregnancy between 28-37 weeks of gestation admitted in labour room were shifted after considering inclusion and exclusion criteria.

Exclusion criteria

- Multiple pregnancy
- Fetal growth restriction
- Uterine anomalies
- Foetal anomalies
- Hypertensive disorder complicating pregnancy
- Gestational diabetes
- Antepartum haemarrhage (placenta praevia, abruption)
- Class 2-4 cardiac disease
- Tumour complicating pregnancy (fibroid, ovarian tumour)
- Medical disorder complicating pregnancy (chronic hypertension, chronic renal disease and SLE).

This was prospective observational study which was carried out those pregnant women admitted with preterm premature rupture of membranes between 28-36 weeks of gestation. Sample size was 200.

The gestational age was calculated from LMP, if there is discrepancy of more than seven days between LMP and early weeks USG and consecutive two coincide then USG EDD taken in to account. Per speculum examination done to confirm the diagnosis of preterm premature rupture of membranes. Digital examination only be done only when the patient is in the active labour.

The above-mentioned patients were closely monitored throughout labour. Immediately after delivery paediatrician was called over and look sign of infection and Respiratory distress syndrome.

Close monitoring done for all patients of preterm premature rupture of membrane during labour and baby immediately after delivery and up to discharge. Incidence of PPROM ranges from 3.0-10.0% of all deliveries. PPROM complicates approximately 3% of pregnancies and leads to one third of preterm birth.

RESULTS

Patients with preterm premature rupture of membrane occur in all age group. 54% belong to age group 22<20 years. 36% belongs to age group 20-25 years. 10% belong to age group >30 years. But it was more common in age group of < 25 years (Table 1). 1 cell (11.1%) have expected count less than 5. The minimum expected count is 4.40. The distribution of age classification among PPROM group is statistically significant. Chi =22.8 P=0.005.

82% (164) of patient of preterm premature rupture of membrane belongs to class 4 socioeconomic class as per modified Kuppusamy classification. Preterm premature rupture of membrane was more common in obese patients with 53.8% (56).

Table 1: Demographic factors and PPROM.

Age group	PPROM group (GA in weeks)			Total
	28-32	33-34	<37	
Up to 25				
Count	20	16	72	108
% within age group	18.5	14.8	66.7	100.0
% within PPROM group	45.5	30.8	69.2	54.0
% of total	10.0	8.0	36.0	54.0
26-30				
Count	20	28	24	72
% within age group	27.8	38.9	33.3	100.0
% within PPROM group	45.5	53.8	23.1	36.0
% of total	10.0	14.0	12.0	36.0
>30				
Count	4	8	8	20
% within age group	20.0	40.0	40.0	100.0
% within PPROM group	9.1	15.4	7.7	10.0
% of total	2.0	4.0	4.0	10.0
Total				
Count	44	52	104	200
% within age group	22.0	26.0	52.0	100.0
% within PPROM group	100.0	100.0	100.0	100.0
% of total	22.0	26.0	52.0	100.0

Table 2: Chi-square tests.

	Value	df	Asymp. Sig. (2-sided)
Pearson chi-square	22.875[a]	4	0.000
Likelihood ratio	23.350	4	0.000
Linear-by-linear association	8.000	1	0.005
N of valid cases	200		

Table 3: Distribution of PPROM in primi and multigravida.

Gravida	PPROM group (GA in weeks)			Total
	28-32	33-34	<37	
1	24	32	52	108
	22.2%	29.6%	48.1%	100.0%
2	12	16	48	76%
	15.8%	21.1%	63.2%	100.0%
3	4	4	0	8
	50.0%	50.0%	0.0%	100.0%
4	4	0	0	4
	100.0%	0	0	100.0%
5	0	0	4	4
	0	0	100.0%	100.0%

The preterm premature rupture of membrane was more common in primi gravidae with 54% incidence.

Table 4: Mode of delivery in PPROM.

Mode of delivery	PPROM group (GA in weeks)			Total
	28-32	33-34	<37	
Vaginal delivery	40	40	48	128
	31.3%	31.3%	37.5%	100.0%
LSCS	4	12	56	72
	5.6%	16.7%	77.8%	100.0%

Mode of delivery among PPROM distribution is statistically significant, 64% of patients among present study PPROM delivered vaginally.

Table 5: Gestational age and the neonatal outcome in PPROM.

Apgar score	PPROM group (GA in weeks)			Total
	28-32	33-34	<37	
7 and above	40	48	100	188
	21.3%	25.5%	53.2%	94.0%
<7	4	4	4	12
	33.3%	33.3%	33.3%	6.0%

Table 5 illustrates that (n=188) newborn have Apgar of more than seven out of which 100 newborn were belong to late preterm group with a incidence of 50%.

Table 6: Neonatal intensive care unit admission and its association with the gestational age.

NICU	PPROM group (GA in weeks)			Total
	28-32	33-34	<37	
No	0	4	32	36
	0	11.1%	88.9%	100.0%
Yes	44	48	72	164
	26.8%	29.3%	43.9%	100.0%

Table 6 illustrates that (n=164) 82% of newborn was admitted in NICU out of which all early PPROM newborn got admitted in NICU.

Table 7: Perinatal morbidity in PPROM.

Respiratory distress	PPROM group (GA in weeks)			Total
	28-32	33-34	<37	
No	0	8	34	42
	0	19.0%	81.0%	100.0%
Yes	44	44	70	158
	27.8%	27.8%	43.3%	100.0%

Table 7 illustrates that (n=158) 79% of newborn have got RD out of which all early PPROM newborn have got RD.

Table 8 illustrates that 8% (n=16) of newborn have clinically obvious infection out of which 6% (n=12) belongs to early PPROM group.

Table 8: Neonatal sepsis in PPROM.

Fetal infection	PPROM group (GA in weeks)			Total
	28-32	33-34	<37	
No	32	52	100	184
	17.4%	28.3%	54.3%	100.0%
Yes	12	0	4	16
	75.0%	0	25.0%	100.0%

Table 9 illustrates that 10% (n=16) of newborn have died of complication out of which 6% (n=6%) in the early PPROM group.

Table 9: Perinatal mortality in PPROM.

Death	(GA in weeks)			Total
	28-32	33-34	<37	
No	32	48	100	180
	17.8%	26.7%	55.6%	100.0%
Yes	12	4	4	20
	60.0%	20.0%	20.0%	100.0%

DISCUSSION

PPROM was more common in age group of less than 25 years with an incidence of 54% out of which 36% late PPROM and 10% early PPROM (Table 1). In a study by Noor et al in Ayub medical college in 2006 demonstrated that (58.8%) higher incidence among younger age group.[6] PPROM was more common in low socio-economic class with an incidence of 82%. In a study done by Sheela et al demonstrated that 62.8% were belongs to low socio-economic class. PPROM was more common in primi gravidae with an incidence of 54% (Table 3). In a study conducted by Ghandhi M et al majority were primigravidae 42.3% and another study by Dkeke et al majority were primigravidae 29.1%.[7,8] PPROM was not associated with previous history of PPROM and abortion with an incidence of 2% and 12% respectively. In a study by Revathy et al 17% had previous abortion and 10% had previous history of PPROM.[9] In present study 64% of patients had delivered vaginally and 36% had delivered by LSCS (Table 4). In a study by Sheela at al 65% had vaginal delivery compared to 16% by LSCS.

Table 5 Among the 200 babies delivered, 188 babies had first minute APGAR score of >7. out of which nearly 50% were late preterm. Table 6 illustrates that (n=164) 82% of newborn needed NICU admission out of which all early PPROM (28 -32 weeks) newborn got admitted in NICU. Majority of neonatal morbidity noted in present study was Respiratory distress contributing to 79% followed by hyperbilirubinaemia by 40% and followed by sepsis by 8%. Respiratory distress was common in early PPROM and hyper bilirubinaemia common in late preterm (Table 7). A study by Emeche et al showed 61% RDS Singel S et al obtained 92% in early PPROM.[10,11] A study by Emeche et al showed 22% RDS, 17.8% hyper bilirubinaemia and 16% sepsis. Similar study by Signel Setal in late PPROM showed 6.6% RDS and 16% sepsis. In present study 79% had RDS, 40% had hyper bilirubinaemia and 8% had sepsis.

In present study 8% (n=16) of newborn have clinically obvious infection out of which 6% (n=12) belongs to early PPROM group (table 8). Most of thepatients delivered vaginally, LSCS were done commonlyfor malpresentations like breech, followed by fetaldistress and failed inductions which acounts for 36%.[12,13]

In our study neonatal mortality is 10%, most common in neonataes delivered between 28-30wks of gestation that is early PPROM (Table 9).[14,15]

CONCLUSION

PPROM was more common in younger age group, low socio-economic class and pimigravidae in present study. PPROM was not associated with previous history, booked or un booked and previous abortion. In present study most of newborn had better 5min Apgar especially late preterm group. Majority of neonatal morbidity was due to RDS followed by hyper bilirubinaemia then followed by sepsis. In present study RDS was common in early preterm group and hyper bilirubinaemia common in late preterm group. In current study most of patients delivered vaginally and LSCS were done for other obstetrics indication which accounts for 36%.

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