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Original Research Article

Maternal and fetal outcome in preterm premature rupture of membrane

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ABSTRACT

Background: The objective was to study the maternal and fetal outcome in women with premature rupture of membranes.

Methods: It was a prospective analytic hospital based study, study population include 100 obstetrics cases of singleton pregnancy with gestational age of 28 week to 36 week with spontaneous rupture of membranes over a period of 2 years, 100 pregnant women without PROM upto 36 completed week taken as control. Detailed clinical examination of the patient was done to see any co-morbidity. Data was collected using a performa. Detailed workup including history, general physical examination, abdominal and pelvic examination and relevant specific investigation were noted.

Results: PROM occurs more frequently in primigravida compared to that of multigravida ($p=0.679$). Risk factors unknown factors 71% and history of coitus 5% UTI ($p=0.001$) which was highly significant, incidence of LSCS were found higher in PROM than in controls ($p<0.05$) which was statistically significant. Out of all vaginal deliveries, percentage of patients who had spontaneous labour were 69.86%, while 30.14% were induced, 60% of cases was spontaneous out of which 51% delivered successfully vaginally and, 9% landed in cesarean section. 16% were given prostaglandin gel out of which 10% delivered successfully. 8% were augmented by oxytocin of which 6% delivered successfully and 2% landed in cesarean section. Out of 100 cases studies, 24% accounted for respiratory distress syndrome, while 6% in control group. 12% septicemia in study group ($p=0.001$) which was highly significant value, while conjunctivitis, neonatal jaundice (hyperbilirubinaemia) and intraventricular haemorrhage accounted for 2%, 3%, and 2% each.

Conclusions: Present study concluded that most common cause of PPRM was unknown. Most common maternal morbidity was puerperal fever and neonatal morbidity was respiratory distress. Maternal and fetal morbidity increases with increase in duration between rupture of membranes and delivery of fetus, so augmentation of labour should be done.

Keywords: PPRM, Morbidity, Respiratory distress, Primigravida

INTRODUCTION

Preterm premature rupture of membranes (PPROM) is defined by Gibret and Harmon, in Year 2003. Premature rupture of membranes (PROM) is defined as rupture of fetal membranes before onset of labour. If it happens between 37 completed weeks and 42 weeks of gestational age, it is called term premature rupture of membranes (TPROM), while that occurring between 24 weeks and 37

weeks is called preterm premature rupture of membranes (PPROM). Rupture of membranes for >24 hours before delivery is called prolonged rupture of membranes.¹

Premature rupture of membrane is common occurrence with an incidence of 5-10%. It is a significant event as it cause maternal complications, increased operative procedures, neonatal morbidity and mortality.² Preterm premature rupture of the membranes (PPROM) occurs in

3% of pregnancies and causes around 25-30% of all preterm deliveries. Since PPRM is associated with lower latency from membrane rupture until delivery, it is an important cause of perinatal morbidity and mortality.^{3,4}

During the latency period, the ascent of pathogenic microorganisms from the lower genital area could create complications such as intrauterine infections. Also, some studies introduced PROM as a pathologic process that often occurs following membrane inflammation and infection.⁵

However, one of the most common complications in PPRM patients is intrauterine infection, which can lead to chorioamnionitis, metritis after delivery and perinatal outcome such as neonatal sepsis. Other complications are cord compression leading to fetal distress, cord prolapse during rupture of membranes and placental abruption. Perinatal outcomes constitute prematurity, neonatal sepsis, respiratory distress syndrome (RDS), intraventricular hemorrhage (IVH), risk of fetal and neonatal death.⁶

For this study it has been defined as the spontaneous rupture of membranes during pregnancy beyond 28 weeks and before 37 completed weeks. The time from the rupture of membranes to the onset of contraction is defined as the latent period. The key factor in the fetal and maternal outcome is that the diagnosis of pre labour rupture of membranes must be established. In most instances either it is obvious from the release of clear amniotic fluid from cervix or by simple laboratory test like detection of fern pattern. The key to the management is an accurate assessment of gestational age and the presence or absence of sepsis. However the management is especially difficult in preterm patient in whom the risk of foetal and maternal infection that can accompany expectant treatment has to be weighed against potential improvement in neonatal outcome that comes with greater maturity of foetal lungs.⁷

Currently most authorities accept a plan of active management which includes prevention of infection, delay of delivery until foetal maturity is achieved, and active intervention by induction if labor is no longer preventable or if early infection is suspected.⁸

The aim of this study was to assess maternal and fetal outcome in women with premature rupture of membranes.

METHODS

Study design

This study was prospective, analytical hospital based study. The study was conducted in J. K. Lone, Mother and Child Hospital, Medical College, Kota.

Study population

The study population include 100 obstetrics cases of singleton pregnancy with gestational age of 28 weeks to 36

weeks with spontaneous rupture of membranes over a period of 2 years. The cases that fulfil the inclusion criteria was selected. The women who were fulfilling inclusion criteria were included in the study.

Exclusion criteria

Women with multiple pregnancy, gestational age <28 weeks and >36 weeks, pregnancy with any of medical disorder, cases with meconium stained liquor, faetal distress, intrauterine death, non-vertex presentation, artificial rupture of membranes and congenital malformations were excluded from the study.

Control

100 pregnant women without PROM upto 36 completed weeks are taken as control.

Sampling technique

Pregnant women with complain of leaking >28 and up to 36 week coming from antenatal, outdoor, emergency were admitted and were enrolled in the study.

Informed consent was taken. The cases fulfilling the inclusion criteria was taken for the study the cases was followed up to the delivery, and in the post natal ward till discharge. The study population was evaluated by detailed history and examination and predesigned proforma was filled for each patient.

Procedure of study

A detailed history was taken age, parity, menstrual and obstetric history with emphasis on exact time of rupture, duration, amount of leaking and association of pain, history of previous similar episodes in other pregnancies and history suggestive of incompetent os were evaluated.

Detailed history regarding recent coitus, severe physical exertion and vaginal examinations if any before admissions was noted. In general examination pulse, BP and temperature were noted followed by systemic examination in obstetric uterine height, presentation, position, lie of fetus and amount of liquor were noted. All parameters of maternal and fetal well-being were recorded.

A sterile speculum examination was conducted and presence of liquor amni was noted. When frank leaking was present litmus test performed. When no amniotic fluid was seen in the vagina, patient was asked to cough and per speculum done to see the drainage of amniotic fluid. In case of doubt fluid from vagina was collected on slide and examined under microscope for ferning. A single pelvic examination was done to note the Bishop's score presence or absence of membranes, presenting part and its station and to rule out cord prolapse and also pelvic assessment. All patients with leaking received prophylactic antibiotics. Thereafter the patient was monitored 4th hourly for signs

of infections. A 4th hourly monitoring of pulse, BP, temperature and presence or absence of contractions was made whenever required. The same was carried out more frequently. Fetal heart rate monitored regularly. Conservative management was done in all cases of PPROM for 24 hours provided there was no maternal or fetal indications for delivery. If patient did not go in labour they were induced with cerviprime gel and syntocinon for vaginal delivery. In cases of failed vaginal delivery or any complications caesarean section was done. Two doses of betamethasone 12 mg i.m. 12 hours apart were given to mothers <34 weeks to enhance fetal lung maturity.

RESULTS

In present study majority belonged to 21-25 age group with in PROM patients and control group and maximum number of patients were unbooked. Maximum number of cases were primigravida 50% and 25% were second gravida.

Table 1: Risk factors for PROM.

Risk factor	Case	Control	P value
Unknown	71	0	0.001
History of recent coitus	10	2	$\chi^2=9.32$
Previous history of PROM	5	3	d/f=4
Polyhydraminos	9	4	
UTI	5	1	

($\chi^2=9.32$, p=0.001, d/f=4, Significant)

Above Table 1 shows that 71% were unknown factors.

Table 2: Parity-wise distribution.

Parity	Case	Control	P value
Primigravida	50	52	0.679
Gravida-2	25	28	$\chi^2=5.26$
Gravida-3	16	18	d/f=3
≥G-4	9	2	
Total	100	100	

($\chi^2=5.26$, p=0.679, d/f=3, not significant)

Above Table 2 shows that maximum number of cases (50%) were primigravida and 25% were 2nd gravida.

Table 3: Duration of leaking wise distribution of case.

Duration of leaking (hours)	No. of patients	Percentage
<12	69	69
12-24	23	23
>24	8	8
Total	100	100

Above Table 3 shows that in 69% women duration of leaking was <12 hours and in 8% women duration of leaking was >24 hours.

Table 4: Type of delivery wise distribution.

Mode of delivery	Case	Control	P value
Vaginal delivery	67	78	0.023
LSCS delivery	33	22	$\chi^2=8.36$
Total	100	100	d/f=1

($\chi^2=8.36$, p=0.023, d/f=1, Significant)

Above Table 4 shows that out of 100 cases 67% delivered vaginally and 33% were LSCS.

Table 5: Neonatal morbidity.

Neonatal morbidity	Case	Control	P value
Respiratory distress syndrome	24	6	0.001
Septicemia and pneumonia	12	0	$\chi^2=9.80$
Jaundice	3	3	d/f=4
Conjunctivitis	2	0	
Intraventricular hemorrhage	2	0	

($\chi^2=9.80$, p=0.001, d/f=4, Significant)

Above Table 5 shows that commonest neonatal mortality was respiratory distress syndrome.

Table 6: NICU admission.

NICU admission	28-30 weeks	31-33 weeks	34-36 weeks	Total
Case	6	10	18	34
Control	4	6	8	18
P value	0.001	$\chi^2=8.94$	d/f=2	

($\chi^2=8.94$, p=0.001, d/f=2, Significant)

Above Table 6 shows that maximum number of NICU admission in cases as well as control group were in gestational age 34-36 weeks.

DISCUSSION

Premature rupture of membranes is fairly a common complication of pregnancy and can lead to increased maternal complications, operative procedures, neonatal morbidity and mortality the present study was undertaken to identify risk factors causing PROM and to study labor outcome maternal morbidity and perinatal morbidity and mortality associated with PPROM.

In our study it is evident that 62% are unknown factors of PPROM and history of coitus 5%, 4% UTI. Findings correlate with the study of Patil et al with unknown factors by 59% and history of coitus 10%, UTI 6% as a cause of PPROM.⁹

Our study shows 50% of PPROM case were primi and 25% 2nd gravida, 16% 3rd gravida. It shows that PROM occurs more frequently in primigravida compared to that

of multigravida. This could be explained on the basis of less married life and more frequency of coitus, causing ascending infections and UTI, prostaglandin production causing direct toxic effect on membranes. Our study is comparable with the study of Jameela et al.¹⁰

Our study shows that 69% women of PPROM leaking time was less than 12 hours. 23% from 12-24 hours and 8% >24 hours. This could be explained on the basis that most of the patient were unbooked and they reported to the concerned CHC or PHC early and were referred to higher center immediately due to lack of NICU facility. Our findings are comparable with the study of Shailaja et al.¹¹

Our study shows that percentage of vaginal deliveries was 67% compared to LSCS which is 33%. LSCS was done more in cases where duration of leaking was more than 12 hrs. Cases with less than 12 hours of leaking were delivered vaginally. Findings are comparable with the study of Patil et al.⁹

In our study 69.86% were delivered vaginally spontaneously, while 13.69% were induced with cerviprime gel, 8.21% induced with syntocinon. Patil et al showed 19% spontaneous vaginal delivery and 17.8% induced by cerviprime gel while Minakeshi et al show 66% spontaneous vaginal delivery and 34% induced with cerviprime gel.^{9,12} Our study is comparable with the study of Patil et al and Minakeshi et al.^{9,12}

Our study shows that out of 100 cases, 24% accounted for respiratory distress syndrome, 12% septicemia. Our study is comparable with study of Patil et al and Padma et al.^{9,13} Our results were lower than Patil et al and Padma et al. This could be explained on the basis as 72% cases were enrolled between 34-36 weeks of gestational age and small sample size.

Present study shows out of 100 cases each in the study and control group, 34% were admitted in NICU which is comparable with the study of Patil et al where NICU admission was 36%.⁹ Our study shows less NICU admission compared with the study of Hassan et al (65.3%).¹⁴ This could be explained on the basis of timely decision of c section for fetal distress, placental abruption and failed progress.

CONCLUSION

Present study concluded that most common cause of PPROM was unknown. Most common maternal morbidity was puerperal fever and neonatal morbidity was respiratory distress. Maternal and fetal morbidity increases with increase in duration between rupture of membranes and delivery of fetus, so augmentation of labour should be done. In our study most common cause of cesarean was previous cesarean. Number of neonatal death were more in newborn weighing less than 1.5 kg this could be because of prematurity than PPROM per se.

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