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Original Research Article

Feto-Maternal Outcome in Term primigravida with PROM – A Cross Sectional Study at Tertiary Care Hospital

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ABSTRACT

Background
Premature rupture of membranes (PROM) is the early rupture of fetal membranes before labor, leading to spontaneous amniotic fluid leakage. [1] It occurs in 5-10% of pregnancies, with 80% at term. [2] PROM is associated with complications such as chorioamnionitis, increased caesarean section rates, sepsis, and endometritis in mothers, and fetal distress, respiratory distress syndrome (RDS), early neonatal sepsis, and fetal death in neonates. [3] The risk of infection increases with the duration of PROM, making timely diagnosis and management crucial. [4] This study aims to evaluate feto-maternal outcomes in term pregnancies with PROM.

Methods
A retrospective study was conducted from May to August 2023 in the Department of Obstetrics and Gynaecology, Cheluvamba Hospital, Mysuru Medical College. Data from 176 term PROM cases were collected, including maternal and neonatal outcomes. Statistical analysis was performed to identify significant trends.
All the collected data were recorded and entered in the microsoft excel data sheet. Data analysis was done using SPSS version- 22 software.

Results
Of 2,483 deliveries during the study period, 176 (7%) were term PROM in primigravida. The mean maternal age was 22.49 years, and 89.77% of cases were delivered within 18 hours of PROM. Vaginal delivery was achieved in 53.41%, while 46.59% underwent caesarean sections, primarily due to fetal distress (82.73%) and failure to progress (15.85%). NICU admission was required for 37.5% of neonates, with complications such as early-onset neonatal sepsis (65.21%) and respiratory distress syndrome (21.73%). Perinatal mortality was 2.84%. Maternal complications, including puerperal sepsis (12.5%) and endometritis (5.69%), were noted in 23.8% of cases.

Conclusion

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Prolonged PROM-to-delivery intervals were associated with increased morbidity and mortality. Appropriate and systematic approach is needed for favorable outcome. The obstetrician and neonatologist role is very important in providing optimal care for both mother and baby.

Key words : PROM, Maternal, fetal outcome.

INTRODUCTION

Premature rupture of membrane (PROM) is defined as the disruption of fetal membranes before the beginning of labor, resulting in spontaneous leakage of amniotic fluid.[1] PROM occurs in approximately 5–10% of all pregnancies of which approximately 80% occur at term. [2]

PROM is associated with increased complications like chorioamnionitis, unfavorable cervix, increased cesarean section rates, PPH, sepsis, endometritis in mother. In the fetus there is increased occurrence of fetal distress, birth asphyxia, jaundice, respiratory distress syndrome (RDS), early onset neonatal sepsis, and fetal death. Furthermore morbidities can increase the need for obstetric interventions in terms of instrumental deliveries or cesarean section due to fetal distress, dry labor or an incoordinate uterine action.[3]

Management of PROM remains controversial and challenging. The risk of intrauterine infection increases with the duration of PROM. Diagnosis and proper management are very important to limit various fetal and maternal complications generally due to infection.

If the interval from leaking to delivery exceeds 18 hours, then there is an increase in incidence of neonatal infections and admissions. Evidence supports the idea that induction of labor, as opposed to expectant management, decreases the risk of chorioamnionitis without increasing the cesarean delivery rate. [4]

Hence, the purpose of this study is to determine the feto-maternal outcome in PROM among term pregnant women.

AIM OF STUDY

1. To determine the incidence of term primigravida with PROM
2. To assess maternal and fetal outcome in terms of mortality and morbidity.

MATERIALS & METHODS

This is a retrospective study carried out in Department of Obstetrics and Gynecology at Cheluvamba hospital, Mysuru Medical College & Research Institute, from May 2023 to August 2023.

A total of 176 pregnant women with diagnosis of PROM after 37 weeks admitted during the study period were included in the study. After Patient admitted to labor ward, examination done for PROM, Uterine contractions noted, BISHOP score assessed and induced with PGE2 gel according to hospital induction criteria of BISHOP score <4. If BISHOP score was still less than 4, second PGE2 gel was instilled intracervically. Due to delay referral as ours is a tertiary care center, induction with third PGE2 gel was not done. Minor CPD were induced and monitored, For major CPD trial was not given. Course in the hospital, management, maternal and fetal outcome was obtained from our medical records and files.

Inclusion Criteria

1. Primigravida admitted with PROM at >37 weeks of gestation.
2. Cervical dilatation of <4cm

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3. Single live pregnancy
4. Lack of uterine contractions for 2 hours from onset of PROM
5. Primigravida with medical disorders were included.

Exclusion criteria

1. Uterine contraction within 2 hour of PROM
2. cervical dilation of ≥ 4cm
3. Multiple pregnancy
4. Intact membrane.
5. Less than 37 weeks of gestational age
6. Multigravida with abortion

Data Analysis and Interpretation

Data was entered into Microsoft Excel (Windows 7; Version 2007) and analyses were done using the Statistical Package for Social Sciences (SPSS) for Windows software (version 22.0; SPSS Inc, Chicago). Descriptive statistics such as mean and standard deviation (SD) for continuous variables, frequencies and percentages were calculated for categorical Variables were determined. Bar charts and Pie charts were used for visual representation of the analyzed data.

RESULTS

During the study period, a total delivery was 2483 at our hospital. A total of 176 (7%) women were term primigravida with PROM were admitted.

Age (Years)	No.	Percent
18-20	62	35.2
21-25	85	48.3
26-30	25	14.2
31-35	4	2.3
Mean (SD)	22.49 (3.27)	
Range	18-35	

Table 1: Distribution of patients according age (N=176)

The most common age group belonged to 21-25years (48.29%). The mean age in our study was 22.49 years in a range of 18-35.

Duration (Hours)	No.	Percent
3-6	21	11.9
7-12	73	41.5
13-24	67	38.1
>24	15	8.5
Mean (SD)	13.94 (7.43)	
Range	3-48	

Table 2: Distribution of Study Subjects according to the Duration of PROM (N=176)

23.3% were between 37-38 weeks, 35.6% were 38-39 weeks, 30.7 were 39-40 weeks, and 10.2% were more than 40 weeks. Mean gestational age was 38.76 completed weeks.

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When risk factors and PROM were compared, anemia was 9.1%, Hypothyroid was 8%, teenage pregnancy was 7.4%, PIH was 5.7% GDM was 2.3%, FGR was 2.3%, breech presentation was 1.1% and obesity was 0.5% in our study with BMI of more than 30 kg/m^2.
13 women (7.4%) had AFI of less than 5. 38.06% had AFI of 6-10cm, 42.61% women had AFI of 111-15cm and 11.93% women had AFI of 11.93%. Mean AFI was 11cm in our study.
53.41% has BISHOP score of ≤ 4. The mean BISHOP score in our study at the time of admission was 4.9

Induction done with PGE2 gel	No.	Percentage
Yes	90	51.14
No	86	48.86
Table 3: Distribution of women according to Induction of labor with PGE2 (N=176)		

Of 176 women, 90 (51.14%) were induced with PGE2. Of those 90 induced women, 62 women (68.89%) delivered vaginally. Of 62 women, 44 women (70.97%) delivered with one dose of PGE2, 18 (29.03%) of them requiring 2 doses of PGE2 gel.

The rest 28 (31.11%) women who were induced, delivered by Cesarean section. The indications were failure to progress (42.86%) in 12 women and fetal distress (42.86%) in 12 women which was common in this group, other indications were minor CPD and Deep Transverse Arrest each.

Out of 86 women who did not require induction with PGE2 gel., 54 (62.79%) women delivered by cesarean section and 32 (37.21%) women delivered vaginally, out of them, 25 (78.12%) delivered spontaneously. 7 (21.87%) of them required oxytocin for labor progression.

Mode of delivery	No.	Percentage
VD	94	53.41
LSCS	82	46.59
Table 4: Distribution according to Mode of delivery. (N=176)		

Indication for LSCS	No.	Percentage
Fetal distress	60	82.73
Failure to progress	13	15.85
Prolonged PROM	3	3.65
CPD	3	3.65
Breech	2	2.43
DTA	1	1.21
Table 5: Indication for LSCS (n=82)		

Overall in 176 subjects, 94 (53.41%) women delivered vaginally and 82 (46.59%) delivered by cesarean section.

Of the 94 women who delivered vaginally, 62 (68.89%) of them were induced with PGE2 gel, 7 of them (7.44%) required oxytocin, and the other 25 (26.59%) delivered spontaneously.

Of 176, 82 women (46.59%) were delivered by cesarean section, of that most common indication was fetal distress (82.73%) followed by failure to progress (15.85%). Out of 3 CPD, 2 were major CPD which were not induced, one was minor CPD which was given trial with PGE2 gel

Rupture of membranes (hours)	No.	Percentage

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< 18	136	77.28
18 – 24	25	14.20
> 24	15	8.52

Table 6: Distribution of patients according to rupture of membrane to delivery interval (n=176)

136 (77.28%) women delivered within 18 hours from PROM. 25 (14.20%) women delivered between 18 – 24 hours. 15 women took (8.52%) delivered after 24 hours. Mean duration from PROM to delivery interval was 13.93 hours

The mean baby weight was 2747.15 grams, 52 babies (29.54%) had low birth weight. 11 babies has 1st minute APGAR less than or equal to 7 and 2 babies had 5th minute APGAR less than or equal to 7.

Of 176 babies, 66 (37.5%) babies required NICU admission, Mean NICU duration of stay was 3.61 days.

Of 66 babies 23 (34.84%) babies had developed complications , early onset neonatal sepsis (EONS) being more common (65.21%), followed by Respiratory distress syndrome (RDS) (21.73%) and two baby (8.69%) had jaundice and one (4.34%) developed Meconium aspiration syndrome (MAS).

Out of 176 babies, 5 (2.84%) babies died. 4 due to sepsis and one due to Severe MAS. All the babies were delivered by LSCS Indications being fetal distress for 3, one being chorioamnionitis, another was major degree CPD. 2 were delivered after induction with single PGE2 gel. The mean PROM to delivery interval among these 5 babies were 25.2 hours

Duration (Days)	**Baby n (%)**	**Mother n (%)**
1-3	40 (67.8)	80 (45.5)
4-7	17 (28.8)	95 (54.0)
>7	2 (3.4)	1 (0.6)
Total	59 (100.0)	176 (100.0)
Mean (SD)	3.61 (1.60)	4.02 (1.58)
Range	1-9	2-19

Table 7: Distribution of Study Subjects according to the Duration of Stay (N=176)

Mean duration of hospital stay of 176 parturient women was 4.02 days and duration of NICU stay of babies was 3.61 days..

Maternal complications	**No.**	**Percentage**
Puerperal sepsis	22	12.5
Endometritis	10	5.69
PPH	6	3.41
Chorioamnionitis	5	2.84
Secondary wound infection	3	1.7

Table 8: Distribution of patients according to maternal complications (N=176)

Out of 176 women, 42 women (23.8%) had postpartum complications. puerperal sepsis was most common among 22 women (12.5%), followed by endometritis (5.69%), PPH (3.41%), Chorioamnionitis (2.84%) and 3 (1.7%) women had secondary wound infection, of these 2 were delivered by cesarean section one by vaginally.

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DISCUSSION

This study investigated maternal and fetal outcomes of term primigravida complicated by PROM and associated factors. In our study, Incidence of term PROM in primigravida in our study was 7% which is within the range of 5-10% [2]

The incidence of PROM was higher in women with rural background , poor hygienic conditions, low SES and unbooked cases 48.29% belonged to age group of 21-25years and 35.22% belonged to 18-20 years. The mean age in our study was 22.4 years. This result is in contrast with the previous studies done by Shetty S et al [5] and Amulya MN et al.[6] which showed the advanced age as risk factor.

89.77% of patients in our study were of ≤ 40 weeks. Mean gestational age was 39 completed weeks. Total of 64 (36.6%) women had risk factors associated with PROM. Of those anemia was 9.1%, Hypothyroid was 8%, teenage pregnancy was 7.4%, PIH was 5.7% GDM was 2.3%, FGR was 2.3%, breech presentation was 1.1% and obesity was 0.5% in our study which was in comparison with Assefa et al study. [7]

7.4% women had AFI of less than 5 cm. 38.06% women had AFI of 6-10cm, 42.61% women had AFI of 11-15cm and 11.93% women had AFI of 11.93%. Mean AFI was 11cm in our study. This was comparable with the study Borna S et al. which showed that as low AFI there is increased maternal and fetal adverse outcome [8]

53.41% has BISHOP score of ≤ 4. The mean BISHOP score was 4.9 in our study at the time of admission. The progress of labor and outcome up to some extent depends on BISHOP score. As the BISHOP score increases, the percentage of normal delivery goes up. In Umed T et al study BISHOP score at induction was 5.4

Mean duration from PROM to delivery interval was 13.93 hours in our study. 136 (77.28%) women delivered within 18 hours from PROM. 15 women took (8.52%) delivered after 24 hours. It was observed in our study that as the duration of PROM to delivery interval increases, there is increased risk of neonatal and maternal morbidity. Mean duration between PROM to delivery was 20.2 hrs in study of Surayapalem S et al [9] and 18.74hours in Kasliwal et al [10]

In the present study, 53.41% delivered vaginally and 46.59% delivered by cesarean section, The most common indication being fetal distress and failed inductions. In the study by Kadikar Gk et al [11] 59%, had vaginal delivery and 41%, had LSCS. In the study by Kiranmaie S [12] 63% women delivered vaginally, 37% delivered by LSCS.

In our study of 176 women, 90 (51.14%) were induced with PGE2. 62 women (68.89%) delivered vaginally, and rest 28 (31.11%) women who were induced, delivered by Cesarean section.

Of 86 women who did not require induction with PGE2 gel., 32 (37.21%) women delivered vaginally, out of them, 25 (78.12%) delivered spontaneously. 7 (21.87%) of them required oxytocin for labor progression.

Overall in 176 subjects, 94 (53.41%) women delivered vaginally and 82 (46.59%) delivered by cesarean section.

Of the 94 women who delivered vaginally, 62 (65.59%) of them were induced with PGE2 gel, 7 of them (7.44%) required oxytocin, and the other 25 (26.59%) delivered spontaneously.

Of 176, 82 women (46.59%) were delivered by cesarean section, of that most common indication was fetal distress (82.73%) followed by failure to progress (15.85%)

In our study mean birth weight was 2747.15 grams. 52 babies (29.54%) had low birth weight. LBW babies was associated with increased incidence of NICU admission and other morbidity. This was comparable with Endale et al [13] study.

Out of 176 women, 42 women (23.8%) had postpartum complications. This was comparable with 28% maternal complications observed in Kasliwal et al study. [10] and 22%

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in Devi et al [14] study Puerperal sepsis was most common among 22 women (12.5%), followed by endometritis (5.69%), PPH (3.41%), Chorioamnionitis (2.84%) and 3 (1.7%) women had secondary wound infection in our study. Mean duration of hospital stay of 176 parturient women was 4 days.

The longer interval from PROM to delivery was associated with longer duration hospital stay. This was similar with Shetty S et al [15] study which was 5 days.

NICU admission and perinatal morbidity increases with increase in PROM to delivery interval. In our study 66 (37.5%) of babies required NICU admission. Of these 66 babies, 23 (34.84%) babies had developed complications , early onset neonatal sepsis (EONS) being more common (65.21%), followed by Respiratory distress syndrome (RDS) (21.73%) and two baby (8.69%) had jaundice and one (4.34%) developed MAS. This was comparable with the study done by Kasliwal A et al. [10] which is 32% and 32.2% in a study by Shah M et al. [16]

NICU admissions were significant in cases due to prolonged PROM, sepsis, and RDS. The number of babies requiring antibiotics was also significant. Mean NICU duration of stay in our study was 3.5 days.

There was 5 perinatal mortality (2.84%) in our study. 4 due to sepsis and one due to Severe MAS. Jaiswal et al [17] and Suryapalem et al [9] had perinatal mortality of 1.43% and 3% respectively.

CONCLUSION

In the present study we observed delayed referral being one of the main cause for increased latency of PROM to delivery interval. Higher NICU admission, longer duration of hospital stay, infectious morbidity and operative interventions are more when duration of PROM increases. we conclude that as the latency of PROM to delivery increases, maternal morbidity and perinatal morbidity increases. Antibiotic protocol to be established and followed to avoid sepsis. Infection prevention measures should be followed to avoid sepsis

Regular timely ANC, timely referral, strengthening of PHCs, and peripheral hospital to avoid delayed referral, and health education is of utmost important. Judicious use of inducing agent and augmenting agent oxytocin to be done for optimal outcome Hence an appropriate and systematic approach is needed for favorable outcome The obstetrician and neonatologist role is very important in providing optimal care for both mother and baby.

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