

## **A Study of Maternal and Fetal Outcomes in Prelabour Rupture of Amniotic membranes**

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### **ABSTRACT**

**OBJECTIVES.** The present study is undertaken to study the fetal and maternal outcomes in PROM and PPRM.

**METHODS** In PPRM less than 34 weeks of gestational age one course of steroids were covered. After explaining the risks of chorioamnionitis, expectant management with meticulous monitoring of parameters of mother and fetal well being were done till the patient gets in to spontaneous labour or induction was done in indicated cases .

**RESULTS:** PROM was common in primigravida. Cesarean sections were more common among primigravidas. Fetal distress was the most common indication. There was no maternal mortality in the study. Neonatal mortality in this was study 8%. Maternal morbidity was 22%. Neonatal morbidity was 28%.

**CONCLUSION:** PROM and PPRM are associated with many complications which can be reduced, by educating the women to have regular antenatal care, explaining risk factors predisposing to PROM and PPRM, correcting the risk factors if possible and report at the earliest.

**KEY WORDS:** PROM, PPRM, chorioamnionitis, maternal morbidity, neonatal morbidity.

### **1.INTRODUCTION**

Prelabour rupture of membranes is a condition associated with high risk of maternal and neonatal morbidity and mortality. Prelabour rupture of the membranes is defined as the rupture of the membranes before the onset of regular uterine contractions. When PROM occurs at or after 37

completed weeks of gestation, it is referred to as term PROM. Preterm PROM(PPROM) is defined as PROM between 24 and 37 completed weeks[1].Prelabour rupture of the membranes is defined as the leakage of amniotic fluid beginning at least 1 hour prior to the onset of labour at any gestational age.Fetal membrane rupture is a physiologic process at term, but when it occurs preterm, it results from, abnormal structural weakening of the membranes in the region of the internal cervical os where it is initiated by membrane stretch and involves local inflammation and ascending bacterial colonization. [1].The weakening of membranes is caused by bacterial collagenases and proteases, but other pathways like increased maternal cytokines or an imbalance in MMPS and TIMPS in response to microbial colonization, trauma, and uterine over-distension[2]are also involved.

It is the time interval between the rupture of the membranes and the onset of uterine contractions.The longer the time interval between the rupture of membranes and onset of labour the greater the risk of ascending infection and chorioamnionitis.The latent period from membrane rupture to delivery is typically brief after PPRM. If PPRM occurs before 34 weeks of gestation, more than 90% of women will deliver within 1 week. With expectant management, a latency of four weeks or more can be achieved.[1].PPROM is a multifactorial process including certain risk components such as: PPRM in previous pregnancy, Smoking, Socioeconomic status,poor nutrition (e.g. Body mass index below 19.8 kg/m<sup>2</sup>, Copper and ascorbic acid deficiencies), Prior cervical conization, Cervical cerclage, Second- and third trimester bleeding, Acute pulmonary disease, Prior episodes of preterm contractions, Infection (bacterial vaginosis), Amniocentesis, Polyhydramnios and Multiple gestation. But in most of the cases, the cause remains unknown and is not apparent at the time of membrane rupture [3].Genital tract pathogens that have been associated with PPRM include *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, *Trichomonas vaginalis*, and Group B  $\beta$ -hemolytic streptococcus (GBS). When fluid leakage occurs after amniocentesis, resealing of the membranes is usual (86 -94%), but it is usually uncommon after preterm premature rupture of membranes.Currently most authorities accept a plan of active management which includes prevention of infection, delay of delivery until fetal maturity is achieved and active intervention by induction if labour is no longer preventable or if early infection is suspected [4].

It is due to the rupture of the amniochorion at a site distant from the internal os. Spontaneous cessation of leakage can occur.PROM and PPRM are obstetric conditions which are poorly defined, with an obscure etiology, difficult to diagnose and is associated with significant

maternal and neonatal morbidity and mortality and has diverse and controversial management strategies. The present study undertaken is to study fetal and maternal outcome associated with PROM and PPRM.[5]

## **2.MATERIALS AND METHODS**

This study was done to know the fetal and maternal outcome in cases of rupture of membranes and to identify the factors helping in optimizing the maternal and fetal outcome. This study was carried out in the department of Obstetrics and Gynaecology, Sreebalaji medical college and hospital.

**Study Design :** An observational study.

**Study Period :** 18 Months (December 2017 to May 2019).

**Sample Size :** 50 cases of PROM, 50 cases of PPRM

### **METHOD OF COLLECTION OF DATA INCLUSION CRITERIA**

- Cases admitted with ROM at >28 weeks of gestation.
- Lack of uterine contraction for at least 1 hour of ROM
- Singleton pregnancy
- Reactive NST
- Clear liquor

### **EXCLUSION CRITERIA**

- Cases admitted with PROM <28 weeks of gestation
- Uterine contraction within 1 hour of PROM
- Features suggestive of chorioamnionitis like fever, tachycardia, uterine tenderness and foul smelling liquor.
- Multiple pregnancy
- Malpresentation

- Non reactiveNST
- Meconium stained liquor, blood stainedliquor
- Any other medical complications like pre eclampsia, diabetes or heartdiseases.
- IUGR and fetalanomalies.

### FOR NEONATE IF ROM INTERVALWAS MORE THAN 12HOURS

- C-reactive protein level in indicatedcases.
- Blood culture and sensitivity in indicatedcases.

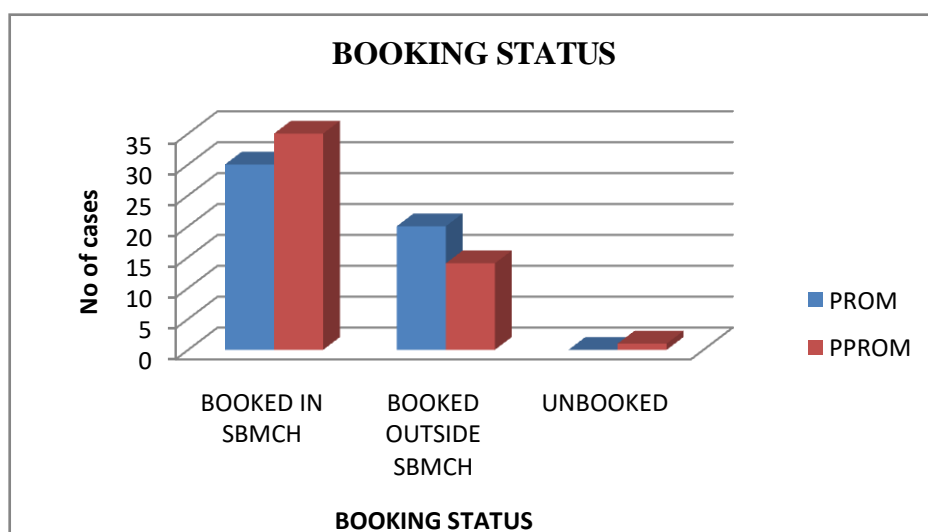
## 3. RESULTS

**TABLE 1 - MATERNAL AGEWISE DISTRIBUTION**

| AGE (YEARS)  | PROM      | PERCENTAGE | PPROM     | PERCENTAGE |
|--------------|-----------|------------|-----------|------------|
| 15 - 19      | 1         | 2          | 1         | 2          |
| 20 - 24      | 33        | 66         | 31        | 62         |
| 25 - 29      | 12        | 24         | 15        | 30         |
| 30 - 34      | 3         | 6          | 2         | 4          |
| >35          | 1         | 2          | 1         | 2          |
| <b>Total</b> | <b>50</b> | <b>100</b> | <b>50</b> | <b>100</b> |

Among the cases, 2 % of the total cases belong to the age group 15 – 19 years, in both the groups. 66 % of PROM Group and 62 % of PPROM group belong to the age group 20 – 24 years, 24 % of PROM and 30 % of PPROM belong to the age group 25 – 29, 6 % of PROM & 4 % of PPROM belong to the age group of 30 – 34 years and 2 % from both the groups belong to the age more than 35 years.It is significant that maximum women were in the age group of 20 -24 years in the study.

**FIGURE 1 - DISTRIBUTION OF BOOKED CASES IN SBMCH AND OUTSIDE SBMCH  
AND UNBOOKED CASES**



Among the total cases, 60 % of the PROM group & 70 % of PPRM group were booked in SBMCH and 40 % of the PROM & 28 % of PPRM group were booked outside SBMCH. 1 was left unbooked in the PPRM case. It is evident that both the cases had majority booked in SBMCH.

**TABLE 2- OBSTETRIC SCORE**

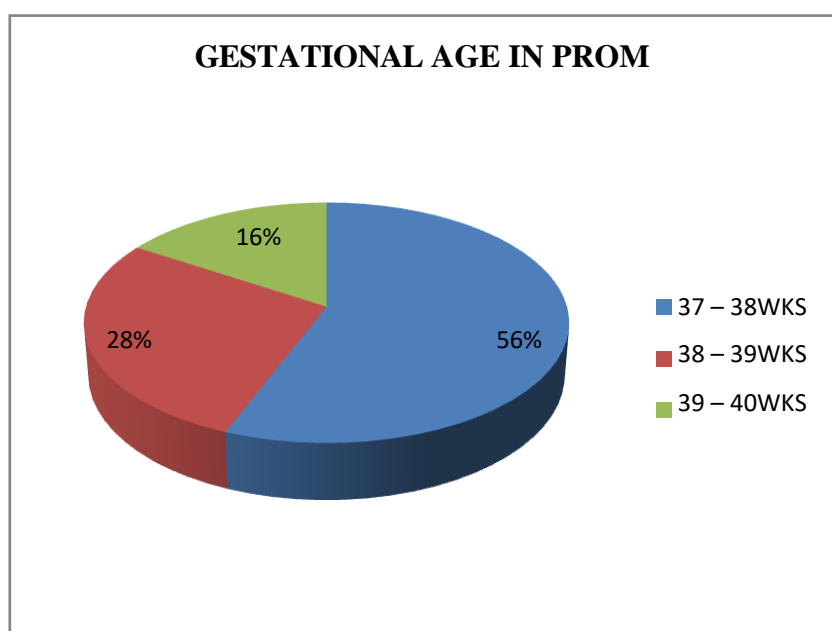
| GRAVIDA      | PROM      | PERCENTAGE | PPROM     | PERCENTAGE |
|--------------|-----------|------------|-----------|------------|
| PRIMI        | 30        | 60         | 32        | 64         |
| MULTI        | 20        | 40         | 18        | 36         |
| <b>TOTAL</b> | <b>50</b> | <b>100</b> | <b>50</b> | <b>100</b> |

Among the total cases, 60 % of the PROM group & 64 % of PPRM group belonged to PRIMI gravida & 40 % of the PROM & 36 % of PPRM group belonged to MULTI Gravida. It is evident that both the cases had majority as PRIMI Gravida.

**TABLE 3. DISTRIBUTION OF SOCIO ECONOMIC STATUS**

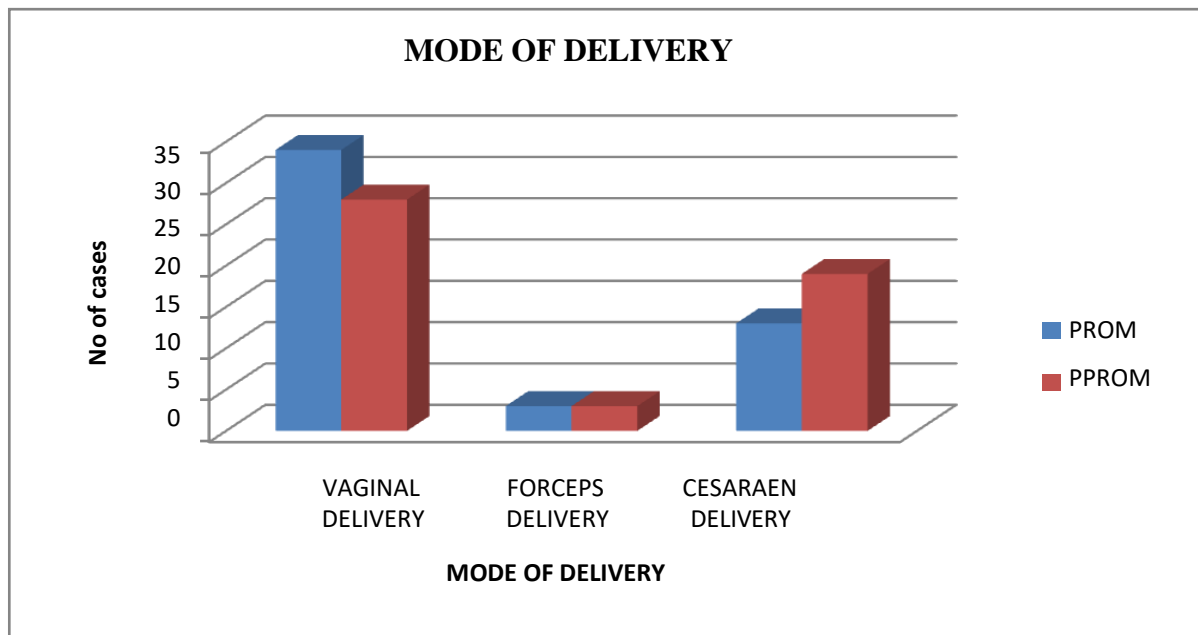
| <b>SOCIO ECONOMIC STATUS</b> | <b>PROM</b> | <b>PERCENTAGE</b> | <b>PPROM</b> | <b>PERCENTAGE</b> |
|------------------------------|-------------|-------------------|--------------|-------------------|
| CLASS I,II                   | 2           | 4                 | 4            | 8                 |
| CLASS III                    | 34          | 68                | 30           | 60                |
| CLASS IV                     | 12          | 24                | 15           | 30                |
| CLASS V                      | 2           | 4                 | 1            | 2                 |
| <b>TOTAL</b>                 | <b>50</b>   | <b>100</b>        | <b>50</b>    | <b>100</b>        |

Among the cases, 4 % of the PROM group & 8 % of PPRM group belong to Class I & II, 68 % of PROM Group and 60 % of PPRM group belong to Class III, 24 % of

**FIGURE 2- ROM ACCORDING TO GESTATIONAL AGE**

Among the cases, the gestational age in PROM Group was observed and found that 56 % were in the gestational age of 37– 38 weeks, 28 % in 38 – 39 weeks and 16 % in 39 – 40 weeks.

**FIGURE 3- MODE OF DELIVERY**



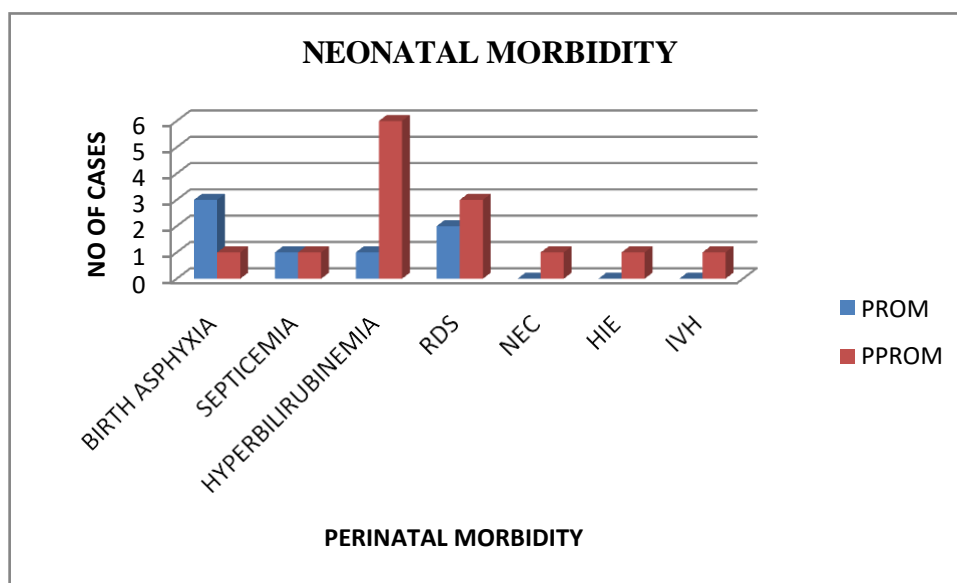
Among the total cases, 68 % of PROM group had vaginal delivery, 6 % had forceps delivery and 26 % had cesarean delivery whereas in the PPROM group, 56 % had vaginal delivery, 6 % had forceps delivery and 38 % had cesarean delivery. It is evident that majority of the cases had vaginal delivery in both the cases.

**TABLE4 MATERNAL MORBIDITY**

| MORBIDITY               | PROM | PERCENTAGE | PPROM | PERCENTAGE |
|-------------------------|------|------------|-------|------------|
| FEBRILE MORBIDITY       | 4    | 8          | 6     | 12         |
| WOUND INFECTION         | 3    | 6          | 3     | 6          |
| URINARY TRACT INFECTION | 2    | 4          | 1     | 2          |
| POST PARTUM HEMORRHAGE  | 0    | 0          | 1     | 2          |

Among the PROM Group, with regard to maternal morbidity, 8 % had febrile morbidity, 6 % had wound infection, 4 % had UTI . In PPROM cases were 12 % had febrile morbidity, 6 % had wound infection, 2 % had UTI and 2 % had PPH.

**FIGURE 4- NEONATAL MORBIDITY**



Among the PROM Group, 6 % of the neonatal morbidity was due to Birth Asphyxia, 2 % was due to Septicemia, 2 % was due to Hyperbilirubinemia and 4 % due to RDS. In PPROM group 12% of neonatal morbidity was due to Hyperbilirubinemia, 6 % due to RDS, 2 % due to Birth Asphyxia, 2 % due to Septicemia, 2 % due to NEC, 2 % due to HIE and 2 % due to IVH.

**TABLE5- NEONATAL MORTALITY**

| CAUSES         | PROM | PERCENTAGE | PPROM | PERCENTAGE |
|----------------|------|------------|-------|------------|
| RDS            | --   | --         | 2     | 4          |
| SEPSIS         | --   | --         | 1     | 2          |
| BIRTH ASPHYXIA | --   | --         | 1     | 2          |

There was no neonatal mortality in this study in PROM group. In PPROM group 4 % of the neonatal mortality was due to RDS, 2 % due to Sepsis and 2 % due to Birth Asphyxia.

#### 4.DISCUSSION

Prelabour rupture of membranes is a complication of pregnancy that leads to various neonatal and maternal complications. The present study is undertaken to see the outcomes of the mother



and the fetus in prelabour rupture of membranes. In the present study, 50 patients admitted with PPRM and 50 patients with PROM were included.[6] In this study, PPRM was present in 62% of cases in the age group of 20 -24 years. Similar results were obtained in a study conducted by Devi et al [62] in which 55% of cases were in the age group 21 -25 years. Patients belonging to socio economic status III were observed to be the most common class to get admitted with PPRM with incidence of 60% which is comparable with the study conducted by Swathi Pandey [63] in which the incidence is 61% and Devi et al in which the incidence is 66% . Studies have shown that there is a correlation between low socio -economic status and defects in the amniotic membrane. The factors that lead to PPRM in low socio-economic status include poor hygiene, malnutrition, anemia, stress, over exertion, high parity, recurrent genitourinary infections etc. These factors lead to a decreased antibacterial activity in the amniotic fluid of patients that in turn leads to PPRM.[7,8]

The major factor that leads to an increase in cases of PPRM among mothers belonging to low socio-economic status is malnutrition. Malnutrition in turn leads to increased risk of infections that eventually leads to PPRM. Hence the cause of PPRM involves a vicious cycle of malnutrition and infections.[10-13] The percentage of booked cases in the present study was found to be 98% while that of unbooked cases was noted to be 2%. In a study conducted by Shwetha Patil et al. , [4] the percentage of unbooked cases was accounting to 31% and booked cases to 69%. The unbooked cases receive poor antenatal care that ultimately leads to increased risk of infection to the mother which is a major risk factor for PPRM. In the present study, 4% of the study population were in the gestational age of 28 -32 weeks, 32% in 32 -34 weeks while the majority was observed in the gestational age of 34 -37 weeks which was noted to be 64%. In a study conducted by Shweta Patil et al., [14] the percentage of PPRM in 28-31 weeks was 7%, that between 32 -34 weeks was 18% and 75% between 35-36 weeks of gestational age, and Devi et al., [15-17] 10.5% of the study population were in the gestational age of 28-31 weeks, 33% in 32-34 weeks while the majority was observed in the gestational age of 35 -36 weeks which was noted to be 56.5%. The risk of PPRM increases with increasing gestational age. This can be justified with the fact that PPRM occurs due to mechanical stretching of membranes with increasing gestational age.[18]

In this study, PROM was present in 66% of cases in the age group of 20 -24 years. Similar results were obtained in a study conducted by Malini et al [19] 76.9% of cases in the age group 20-29 years. Studies show that the risk of PROM increases with age. In a study done by Anjana

Devi[20] 76.9% of cases were in the age group 20 -29 years. Patients belonging to socioeconomic status III were observed to be the most common class to get admitted with PROM with 68% which is comparable with the study conducted by Swathi Pandey [21] which is 61% and Malini et al [22]. Ratnam stated that low socioeconomic status is associated with factors like malnutrition, overexertion, poor hygiene, stress, recurrent genitourinary tract infections, high parity and anaemia which increases the risk of PROM considerably. The most common cause for neonatal morbidity was birth asphyxia (6%), followed by RDS (4%) and septicemia and hyperbilirubinemia (2% each). Fetal morbidity increases with increase in PROM to delivery interval. Neonatal morbidity in the present study is 12%. In the study by Sanyal[24] it was 32% and 28% by Malini et al[25], the common reasons for neonatal morbidity being birth asphyxia, septicemia, umbilical cord sepsis, conjunctivitis, LRTI, convulsions, meconium aspiration syndrome in descending order. There was no neonatal mortality in the present study. But study conducted by Malini et al[26] had 3.5% neonatal mortality rate. 2% of neonates died of birth asphyxia and 1.5% expired due to septicemia.

## 5. CONCLUSION

Avoidance of coitus in the later weeks of pregnancy reduces the risk of ROM. Mothers diagnosed to have polyhydramnios are prone to suffer from ROM, hence adequate rest and proper care can reduce ROM to a certain extent. Urinary tract infections can be treated by administration of antibiotics. This will help in reduction of incidence of ROM.

The use of antibiotics in the latent period can reduce the maternal complications like puerperal pyrexia and chorioamnionitis. Septicemia in the neonates can also be prevented by the use of antibiotics. Administration of corticosteroids in PPROM <34 weeks reduces the neonatal morbidity that includes respiratory distress syndrome which is the most common cause of neonatal deaths. Although PPROM is a common complication of pregnancy, its consequences can be prevented by the use of antibiotics and corticosteroids.

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**Ethical approval:** The study was approved by the Institutional Ethics Committee

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

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