



## Preterm prelabour rupture of membranes (PPROM) and its maternal and perinatal outcome

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### Abstract

**Background:** The leading cause of perinatal morbidity and mortality is prematurity in developed and underdeveloped countries. In one-third of the patients with preterm labour, there is associated premature rupture of membranes. The study was conducted to evaluate the clinical presentation of Pre-labour Rupture of Membrane (PROM) in pregnancy and obstetric outcome.

**Objective:** The aim of the study to observe the maternal and perinatal outcome in preterm prelabour rupture of membranes.

**Method:** The present study was a prospective observational study of perinatal and maternal outcome in 130 cases of preterm premature rupture of membranes in between 28-37 weeks gestation with a singleton pregnancy, from April 2011 to September 2011. Patients with medical complications like anemia, preexisting hypertension, diabetes, vascular or renal disease, multiple gestations, uterine or fetal anomalies etc. are excluded from the study. Detailed history, physical examinations were carried out and appropriate management was instituted as per individual patients need. Statistical analysis of the results was obtained by using window-based computer software devised with Statistical Packages for Social Sciences (SPSS-22).

**Results:** It was revealed that 25.38% subjects were suffered from puerperal sepsis, 13.07% from PPH, 11.58% subjects had wound infections, 17.70% from Chorioamnionitis. A large group (55.38%) of subjects had a hospital stay for more than 7 days. It was observed that 95.77% babies were premature. Low birth weight was prevailed as 80.28%, 27.46% had foetal deformity, 32.69% was suffered from neonatal jaundice, 18.30% from neonatal infection, 28.83% had neonatal asphyxia, 08.43% from respiratory distress syndrome. Among 142 baby's foetal death occurred in 17 cases.

**Conclusion:** PPRM is very often seen in obstetric ward. From the findings of this study, it can be concluded that maternal and foetal complications are likely to be more common in PPRM. Therefore, proper management and care might be necessary to reduce maternal and foetal complications.

**Keywords:** prelabour, rupture, membranes, morbidity, prematurity

### Introduction

Premature rupture of membrane (PROM) is an obstetric condition, poorly defined with an obscure etiology, difficulties in diagnosis, associated significant maternal, fetal and neonatal risks and management strategies that are often diverse and controversial. [1] It is responsible for approximately 30% of all preterm delivery. [2] Rupture of the membrane may occur at any time during pregnancy. Under normal circumstances, the fetal membranes rupture during the active phase of labor. Premature rupture of the membrane occurs when the membranes rupture before the true onset of labor. When it (PROM) occurs before 37 completed weeks it is called preterm prelabour rupture of membranes (PPROM). PROM affects 2.7% to 17% of all pregnancies and in most cases happens spontaneously and without apparent cause. [3] PPRM complicates approximately 3% of all pregnancies in the United States. [4] The incidence of preterm PROM in Bangladesh is not known. Tasnim S. in her study showed that hospital incidence of (PROM) is 8.2% at Dhaka Medical College Hospital in 1997. Among them, forty-five percent occurred in term pregnancy and 34.55% occurred in preterm pregnancy. [5] PROM is usually followed by labor. The time interval between rupture of membranes and labor is defined as the latent period. [6] This may vary from hours to many

days. If more than 24 hours have elapsed before labor ensues, the prolonged premature rupture of the membrane is used. [7] In a study at the University of California in Los Angeles, it was found that labor started within 24 hours of PROM in 81% of patients carrying babies larger than 2500 gm. [8] The situation is markedly different when PROM occurs early in gestation and only 48% Of the patients develop labor [9].

The etiology of PPRM is largely unknown though it may be associated with an incompetent cervix, an unstable lie, oligohydramnios, multiple gestations or possibly asymptomatic bacteriuria especially when B streptococci are the infecting agents. [12] Preterm premature rupture of the membrane is associated with an increased risk of acquiring perinatal infections including chorioamnionitis, endometritis, fetal deformities and neonatal sepsis. [13] A clinical diagnosis of chorioamnionitis accompanies PPRM in approximately 10% of cases (range 3% to 30%). [14] Regardless of the clinical science of infection, as many as 25% to 30% of women with PROM (range 14.6% to 43.3%) have a positive amniotic fluid culture. The range of neonatal sepsis in cases of PPRM with or without clinical amnionitis has ranged from 2% to 19% and the range of neonatal deaths caused by infections is from 1% to 7%. [10] The frequency of neonatal infection varies according to

gestational age, social class, race and maternal antepartum course as well as the definition used by the investigators. [10] One study showed that the incidence of post-partum endometritis was 13% inpatient with preterm premature rupture of membranes. [15] Epidemiological studies have identified several risk factors associated with a high risk of PPROM. Genital tract infection or colonization with various microorganisms, coitus, low socioeconomic status, poor nutrition, anemia, poor hygiene, stress, multi parity, smoking and bleeding in pregnancy have all been linked to an increased chance of PPROM. [10] Education plays a vital role in reducing the risk of premature delivery, especially in developing countries. [11]

**Objective**

The aim of the study is to observe the maternal and perinatal outcomes in preterm prelabour rupture of membranes.

**Method**

The present study was a prospective observational study of perinatal and maternal outcome in 130 cases of preterm premature rupture of membranes in between 28-37 weeks gestation with a singleton pregnancy, from April 2011 to September 2011. Samples were collected by the purposive sampling method. Inclusion criteria were Gravid women, both primi and multi with preterm premature rupture of membrane, Pregnancy of more than 28 weeks duration and less than 37 weeks and Spontaneous rupture of membrane. Exclusion criteria were women who were admitted with rupture of membranes with established labor, Ruptured membrane with antepartum haemorrhage and Rupture membrane with 37 completed weeks. Patients with medical complications like anaemia, preexisting hypertension, diabetes, vascular or renal disease, multiple gestations, uterine or fetal anomalies etc. are also excluded from the study. Detailed history, physical examinations were carried out and appropriate management was instituted as per individual patients need. Statistical analysis of the results was obtained by using window-based computer software devised with Statistical Packages for Social Sciences (SPSS-22).

**Result**

A total of 130 cases were included in the study. The mean age was 26.25 years with a standard deviation of the mean (SD) ±04.24 years and their age ranged from 18 to 35 years. The maximum number was found in the age group of 21-29. The majority (49.24%) of subjects were in between 34 weeks to 37 weeks of gestation. Among 130 subjects, 18.46% had a gestational age between 28 weeks 32 weeks. Among 130 subjects, the majority (66.15%) lead a married life below 5 years. 61.42% was Multipara. Among 89 multipara subjects, 21.54% had a previous history of PROM.

The majority of the subjects had no history of MR (87.70%) and D&C (86.15%). This study was carried out among 130 subjects.

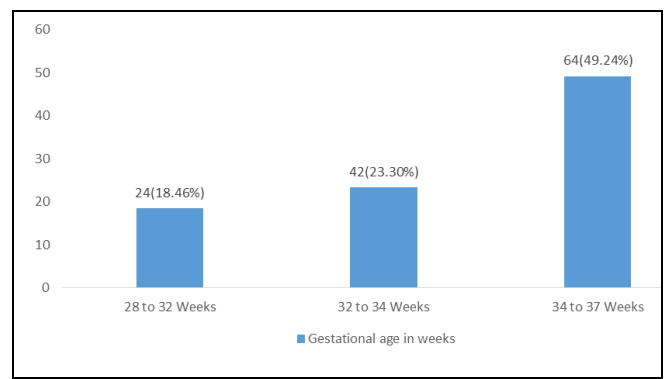
They give birth to 142 babies (Including single and multiple pregnancies). Foetal complications related to PPROM elicited multiple responses. It was observed that 95.77% of babies were immature.

Low birth weight has prevailed at 80.28%. 27.46% had a foetal deformity. 32.69% was suffered from

neonatal jaundice, 18.30% from neonatal infection, 28.83% had neonatal asphyxia, 08.43% from respiratory distress syndrome. Among 142 baby's foetal death occurred in 17 cases. This study was carried out among 130 subjects. Responses were asked about some selected maternal complications related to PPROM and multiple responses were elicited. It was revealed that 25.38% of subjects were suffered from puerperal sepsis, 13.07% from PPH, 11.58% of subjects had wound infections, 17.70% from Chorioamnionitis. A large group (55.38%) of subjects was admitted to the hospital for more than 7 days.

**Table 1:** Age distribution of the study (n=130).

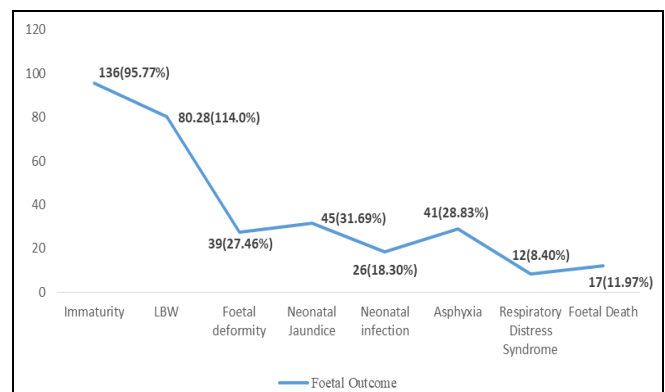
Age group (Years)	n=130	%
≤20	13	10.00
21-29	83	63.84
30 and above	34	26.26
Mean± SD	26.25±04.24	
Range (Min-max)	(18-35)	



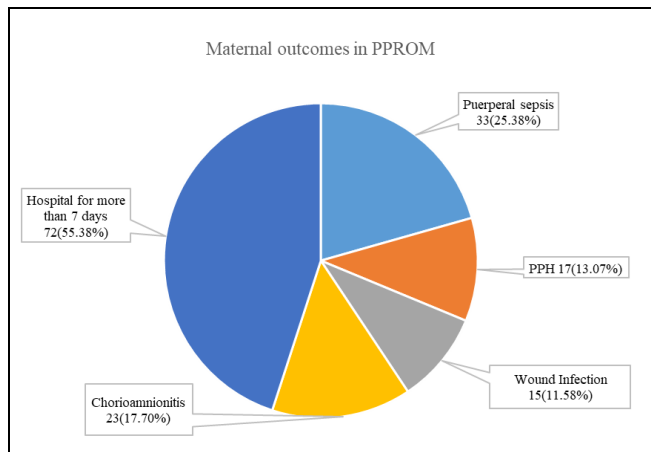
**Fig 1:** Gestational age in weeks (n=130)

**Table 2:** Risk factors of the study subjects on basis of clinical history (n=130)

Traits	Parameter	n	%
Age of marriage	≤5 years	86	66.15
	>5 years	44	33.85
Parity	Primipara	41	31.58
	Multipara	89	61.42
Gravida	≤3	106	85.50
	>3	24	14.50
Previous history of PROM	Positive	19	21.54
	Negative	70	71.10
Previous history of MR	Positive	16	12.30
	Negative	114	87.70
Previous history of D&C	Positive	18	13.85
	Negative	112	86.15



**Fig 2:** Foetal complications in PPROM



**Fig 3:** Maternal outcomes in PPRM (n=130)

## Discussion

Premature rupture of membranes (PROM) is the rupture of the fetal membranes before the onset of labor. In most cases, this occurs near term, but when membrane rupture occurs before 37 weeks gestation, it is known as preterm PROM. Preterm PROM complicates approximately 3 percent of pregnancies and leads to one-third of preterm births. It increases the risk of prematurity and leads to a number of other perinatal and neonatal complications, including a 1 to 2 percent risk of fetal death. Physicians caring for pregnant patients should be versed in the management of preterm PROM because rapid diagnosis and appropriate management can result in improved outcomes. A total of 130 cases age between 18 to 35 years were included in the present study. The mean age was 26.25 years with a standard deviation of a mean of about  $\pm 04.24$  years.

As the general objective of the study was to find out the maternal and perinatal outcome in preterm prelabour rupture of membranes so, responses were asked about some selected maternal complications related to PPRM and multiple responses were elicited. This revealed that the respondents mostly had puerperal sepsis (25.38%), PPH (13.07%), chorioamnionitis (17.70%) and wound infections (11.58%). This suffering of infection was may be due to poor hospital management, inability to purchase medicine, poor health condition of the study subjects. Several studies proved that chorioamnionitis was associated with puerperal sepsis, wound infection and poor physical condition of the patients. [4, 5, 10-12] This study result was comparable with the study conducted by Patrick *et al.* (2005) [19] where maternal outcome prevailed similarly with this present study. A large group (55.38%) of subjects was admitted in the hospital for more than 7 days. Arias *et al.* (1928) [2] conducted a study that gave a similar result. These hospital stays not only increase maternal morbidity but also the financial burden. Multiple logistic regression analysis revealed maternal outcome in PPRM was related statistically with previous obstetric and medical history. But only puerperal sepsis wound infection and hospital stay had statistically significant association with obstetric and medical history. This study was carried out among 130 subjects. They give birth to 142 babies (Including single and multiple pregnancies). Foetal complications related to PPRM elicited multiple responses. It was observed that 95.77% of babies were immature. Low birth weight was prevailed as 80.28%. 32.69% was suffered from neonatal jaundice, 18.30% from neonatal infection, 28.83% had neonatal

asphyxia, 08.43% from respiratory distress syndrome. Similar study result was observed by Tanir *et al.* (2003) [17] and Romero *et al.* (1988). [15] Tanya *et al.* (2006) reported respiratory distress syndrome in a study about 35%. [16] Among 142 babies foetal death occurred in 11.97% cases. But this result was higher that the study conducted by Tanya *et al.* (2006) [17] where foetal death was 1-2%. Postpartum foetal death is very much higher in our country because neonatal infections, LBW, respiratory distress syndrome contribute in foetal death. Multiple logistic regression analysis between one foetal outcome with selected medical and obstetric history revealed that foetal outcome in PPRM was related with previous obstetric and medical history. Immaturity, LBW, neonatal infection and foetal death had statistical significant association with medical history. Obstetric history had statistical relationship only with foetal asphyxia. Among 130 subjects, majority (66.15%) lead a married life below 5 years. So, it could be thought PPRM occurs mainly in case of multipara (61.42%) in their early married life. Among 89 multipara subjects 21.54% had previous history of PROM. Majority (88.46%) received ANC during their pregnancy and 75.38% was immunized against tetanus. This result is similar with the national statistic. Among 130 study subjects, 20% subjects had Oligohydramnios. Yoon *et al.* (1999) [18] observed the same result regarding Oligohydramnios and Oligohydramnios in women with preterm premature rupture of membranes is associated with an inflammatory response in the fetal, amniotic, and maternal compartments. 68.14% had leg edema. In majority (69.93%) of the cases, there was spontaneous rupture of membrane. Diabetes mellitus was prevailed as 13.84%, hypertension as 23.00% and renal diseases as 03.10%. Only 03.85% subjects had ischemic heart diseases. These results had the same result of the previous studies. [5-9, 13-16]

## Limitation of the Study

This was a cross-sectional study with a small-sized sample. So, the findings of this study may not reflect the exact scenario of the whole country.

## Conclusion

PPROM is very often seen in the obstetric wards. From the findings of this study, it can be concluded that maternal and foetal complications are likely to be more common in PPRM. Therefore, proper management and care might be necessary to reduce maternal and foetal complications. However, it is recommended that further study can be carried out by including a large number of study subjects to assess the magnitude of complications caused by PPRM.

## Recommendation

This study can serve as a pilot to much larger research involving multiple centres that can provide a nationwide picture, validate regression models proposed in this study for future use and emphasize points to ensure better management and adherence.

## Funding

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## Conflict of interest

None declared

**Ethical approval**

None declared

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