

## Original Article



# Clinical Profile and Feto-Maternal Outcome of Preterm Prelabour Rupture of The Membrane in a Tertiary Level Hospital

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### Abstract

**Background:** The rupture of fetal membrane before onset of labour at less than 37 completed weeks of gestation. Incidence of Preterm prelabour rupture of membrane (PPROM) ranges from 3.0-10.0% of all deliveries and causes around 25-30% of all preterm deliveries. **Objective:** To see the clinical profile, maternal and fetal outcome of preterm prelabour rupture of the membrane. **Materials and Methods:** One hundred fifteen pregnant women with 28-37 weeks of gestation and diagnosed as PPRM admitted in different units selected by purposive sampling, fulfilled the inclusion and exclusion criteria were enrolled as study population in this study. **Results:** The mean age was 24.65(±3.68) years. Majority (75.65%) were primi para. The mean gestational age was 32.34(±2.86) weeks, 79.13% had gestational age between 30-36 weeks and 20.87% had up to 30 wks. The common risk factors of the study population were history of coitus, CPD, infection and history of abortion which were 42.61%, 9.57%, 5.22% and 4.35% respectively. Majority 55.65% women had vaginal delivery, 44.35% had caesarian section. Majority of the babies born to PPRM group were in the very low birth weight category (53 cases 62.3%), whereas only 32 cases (37.6%) were of normal birth weight. Infection and perinatal mortality was significantly associated with PPRM. **Conclusion:** PPRM can be prevented avoiding the certain risk factors by proper ante natal checkup, strict follow up, good obstetrical care and perinatal care, making mass awareness of the sequelae.

**Key words:** Preterm, Prelabour, Rupture membrane, Feto-maternal, Outcome

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### Introduction

Preterm prelabour rupture of membrane (PPROM) is defined as rupture of fetal membrane before onset of labour at less than 37 completed weeks of gestation.<sup>1</sup> Incidence of PPRM ranges from 3.0-10.0% of all deliveries.<sup>2,3</sup> and causes around 25-30% of all preterm deliveries.<sup>4</sup>

There are numerous risk factors for PPRM, such as physiologic changes, intrauterine infection at early gestational age, lower socioeconomic status of pregnant women during pregnancy, sexually transmitted infections, vaginal bleeding, smoking

during pregnancy, mal presentation and multiple pregnancy etc.<sup>1,3,5</sup>

Since PPRM is associated with lower latency from membrane rupture until delivery, it is an important cause of perinatal morbidity and mortality.<sup>4</sup> During the latency period, the ascent of pathogenic microorganisms from the lower genital area can create complications such as intrauterine infections.<sup>6-10</sup> Bacterial infection in choriodecidual levels with brief amnion involvement has been observed after PROM and one of the most common complications in PPRM patients is intrauterine infection, which can lead to chorioamnionitis, metritis after

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delivery puerperal sepsis and perinatal outcome such as neonatal sepsis.<sup>4</sup>

Other complications are cord compression leading to fetal distress, cord prolapse during rupture of membranes and placental abruption.<sup>4,6</sup> Perinatal outcomes constitute prematurity, neonatal sepsis, respiratory distress syndrome (RDS), intra ventricular hemorrhage (IVH), risk of foetal and neonatal death.<sup>7</sup>

When PROM occurs earlier from term, there are significant risks of maternal and perinatal morbidity and mortality, therefore the attending physicians play an important role in the management of PPRM. They should develop pregnancy outcome plan, whereby a suitable decision is reached for decreasing maternal and fetal risks.<sup>11</sup> Most authors have proposed a strategy for the conventional management for women with antibiotic and corticosteroid administration.<sup>4</sup> The main benefit of the conservative management is to prolong pregnancy which can decrease gestational age-related morbidity associated with prematurity, but the benefit must be balanced with the risks of conservative management, such as clinical chorioamnionitis.<sup>4,7,8</sup>

In this study it is tried to find out the clinical profile and the maternal and fetal outcome of PPRM admitted in BSMMU, Dhaka.

## Materials and Methods

The study was done in the Department of the Obstetrics and Gynaecology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, from June 2014 to November 2014, This was a cross-sectional observational study. All pregnant women with a gestational age of 28-37 weeks and diagnosed as PPRM admitted in different units of Department of Obs & Gynae (BSMMU), Dhaka, and fulfilled the inclusion and exclusion criteria were enrolled as study population in this study. Purposive sampling was employed as sampling technique in this study.

Preterm prelabour rupture of membrane (PPROM) is defined as rupture of fetal membrane before onset of labour at less than 37 completed weeks of gestation.

Inclusion criteria were women with gestational age of 28-37 weeks, diagnosed as PPRM, singleton pregnancies, adequate pelvis, adequate amount of liquor.

After admission of the patient, history was taken and clinical examination was done. At first, the selected patients who fit the criteria was shifted into labour room and observed for 12 hours in the view of emerging contractions, bleeding or possible start of delivery using non-assuring fetal tests and fetal heart monitoring. Vaginal examinations might be performed during hospitalization; however examinations were performed using a sterile speculum when necessary. PPRM was confirmed if on sterile speculum examination there were liquor draining along with reduced amniotic fluid index on ultrasound. If any symptoms of bleeding, contraction, fetal distress were observed after 12 hours, and the patients did not enter the active phase of

labour, they were transferred to the obstetric unit for expectant management. Gestational age of 28-37 weeks was considered for this study. Gestational age was estimated by the patients last menstrual period (LMP). It was determined on the basis of whether menstruation is regular or by ultrasonography detecting gestational age of <20 weeks. An ultrasound was used for verification when the results of the two methods was inconsistent by more than 7 days, For the patients who was not have a sonography, gestational age was determined by a new sonography and comparing fundal height with the date of last menstrual period. The other inclusion criteria include normal fetus showed in previous sonographies.

If any symptoms of bleeding, contraction, fetal distress was not observed after 12 hours, and the patients did not enter the active phase of delivery, they were transferred to the obstetrics unit for expectant management. In this way 115 pregnant women with a gestational age of 28-37 weeks diagnosed as PROM was selected.

Informed written consent was obtained from the patients after full explanation of the details of the disease process, options of treatment, ultimate outcome, possible side effects and complications and above all the purpose of the study. They were informed of their right to withdraw from the study at any stage. Expectant management was included a course of Dexamethasone 6 mg IM stat and 12 hourly of 4 doses.

Cefuroxime 750mg IV stat and 8 hourly till stoppage of leakage of liquor and the then orally 500mg 12 hourly for a total 7 days. During hospitalization, fetal heart rate (FHR) and fetal movement; and maternal pulse, temperature, uterine contraction, color of amniotic fluid was checked every 4 hours. Patients were followed up till their delivery and postnatally, and data regarding mode of delivery, fetal weight, fetal APGAR score, weight and neonatal outcome was recorded on the data collection sheet.

Data was processed manually and analyzed with the help of SPSS (Statistical package for social sciences) 21.0 for windows. Quantitative data were presented as mean and standard deviation; and comparison was done between the groups by student "t" test. Qualitative data were presented as frequency and percentage; and comparison carried out between two groups by Chi-square (X<sup>2</sup>) or Fisher's Exact Test where necessary. A probability value (p) of <0.05 was considered statistically significant.

Quality was obviously maintained. Regular instruction from the supervisor was taken. All the patients were examined carefully. Regular follow-up for each patient was strictly maintained. Every data was kept confidential.

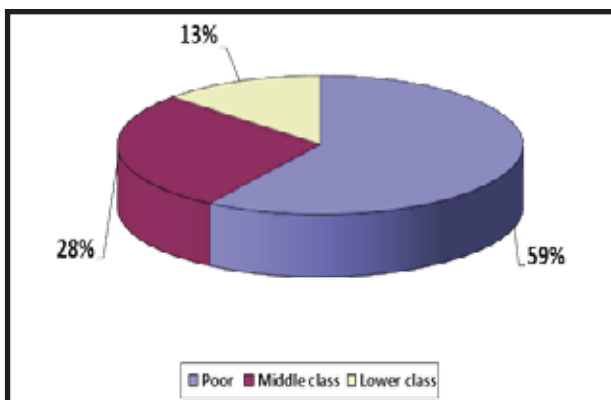
The protocol was ethically reviewed and approved by The Ethical Review Committee of Bangabandhu Sheikh Mujib Medical University, Dhaka. Detailed study related information was explained in the local language from a printed handout and written informed consent was obtained from every patients/relatives of the patients. All aspects including confidentiality and right not to be participated were duly considered.

## Results

The mean age was 24.65(±3.68) years, minimum age was 20 and maximum age was 32 years, majority age group was 18-25 years which is 49.57% (Table I). 59% patients came from very poor socio-economic condition, 13% patients came from lower class economic condition and 28% were come from middle class socio-economic conditions (Figure 1). The majority (75.65%) were primi para and 24.35% were multi para (Table II). The majority (77.39%) were primi gravida and 22.61% were multi gravida (Table III). The mean of gestation was 32.34(±2.86) wks, 79.13% were gestational age between 30-36 wks and 20.87% were up to 30 wks (Table IV). The common risk factors of the study population were history of coitus, CPD, infection and history of abortion which were 42.61%, 9.57%, 5.22% and 4.35% respectively (Table V). The majority 55.65% women had vaginal delivery, 44.35% had caesarian section (Table VI). Common complications of mother were fever, postpartum hemorrhage, puerperial sepsis and anaemia which were 37.39%, 7.83%, 14.78% and 3.48% respectively (Table VII). Out of 115 patients delivered 111 babies (96.52%) born alive and 4(3.48%) still birth. All babies had LBW, 33.91% were 1.0-1.5 kg, 42.61% were 1.5-2 kg and 23.48% were 2-2.5 kg. APGAR score 36.52% were <7. Common neonatal morbidity was severe birth asphyxia, Prematurity, Septicemia and Pneumonia 10.43%, 6.09%, 5.22% and 2.61% respectively. Neonatal death was 12(40.43%) and out of 12 cause of neonatal death 05 had severe birth asphyxia and 03 had prematurity and 4 had septicemia (Table VIII).

**Table I:** Age distribution of the study population

Age group	PROM	Total
18-25 years	57	49.57
26-30 years	39	33.91
>30 years	18	15.65
Total	115	100.00
Mean ±SD	24.65(±3.68)	20-32 years



**Figure 1:** Distribution of socio-economic status of the study population

**Table II:** Distribution of the parity of the study population (n=115)

Parity	Frequency	Percent
Primi para	87	75.65
Multi para	28	24.35

**Table III:** Distribution of the gravid women of the study population (n=115)

Gravida	Frequency	Percent
Primi gravida	89	77.39
Multi gravida	26	22.61

**Table IV:** Distribution of the study population according to gestational age (n=115)

	Frequency	Percent
Up to 30 wks	24	20.87
< 37 wks	91	79.13
Mean gestation	32.34(±2.86)	29-39 wks

**Table V:** Risk factors of the PROM (n=115)

Risk factors	Number	Percentage
H/O coitus	49	42.61
CPD	11	9.57
Hydroamnions	02	1.74
Infection	06	5.22
Smoking	02	1.74
H/O abortion	05	4.35
Not known	53	46.09

**Table VI:** Distribution of mode of delivery (n=115)

Mode of Delivery	Frequency	Percent
Vaginal delivery	64	55.65
LUCS	51	44.35

**Table VII:** Maternal complication of the study population (n=115)

Complication	Number	Percent
Fever	43	37.39
Postpartum hemorrhage	09	7.83
Puerperial sepsis	17	14.78
Anaemia	04	3.48

**Table VIII:** Perinatal outcome of the study population

Perinatal outcome	Number	Percentage
<b>Born alive</b>	111	96.52
<b>Stillborn</b>	04	03.48
<b>Birth weight</b>		
• 1.0-1.5 Kg	39	33.91
• 1.6-2 Kg	49	42.61
• 2.1-2.5 Kg	27	23.48
<b>APGAR score</b>		
• < 7	42	36.52
• ≥ 7	73	63.48
<b>Neonatal morbidity</b>		
• Severe birth asphyxia	12	10.43
• Prematurity	07	6.09
• Septicemia	06	5.22
• Pneumonia	03	2.61
• Meningitis	02	1.74
• MAS	02	1.74
<b>Neonatal death</b>	12	10.43
<b>Cause of neonatal death</b>		
• Severe birth asphyxia	05	4.35
• Prematurity	03	2.61
• Septicemia	04	3.48

## Discussion

In this study mean age was 24.65(±3.68) years, minimum age was 20 and maximum age was 32 years, majority age group was 18-25 years which was 49.57%. Fifty nine percent patients came from very poor socio-economic condition, 13% patients came from lower class economic condition and 28% came from middle class socio-economic conditions. Shrestha and Sharma study showed majority of patients in PROM were in between 20-24 age group, which is similar to the study done by Anjana Devi et al, who found majority of patients belonged to 20-29 years age group and it may be due to majority of fertile women are in this age group.<sup>9</sup> Gandhi M et al study showed lower socio-economic condition also predispose to malnutrition.<sup>10</sup> The maximum incidence of PROM (77.6%) was between age group off 21-30 years, being highest in 21-25 year group. The apparent higher incidence of PROM in age group 21-25 years was due to fact that patients complete their child bearing in 3rd decade.

In this study majority (75.65%) were primi para and 24.35% were multi para. Gandhi M et al study showed the incidence of PROM was 60.7% in primigravida while it was 39.3% in multigravida patients. Noor S et al study showed majority 51.76% were primi para and 48.24% were primi gravida.<sup>11</sup>

The present study showed mean gestation was 32.34(±2.86) wks, 79.13% had gestational age between 30-36 wks and

20.87% had up to 30 wks. Previous history of miscarriages and preterm delivery was statistically significant as has been reported in other studies.<sup>12,13</sup> Two-thirds of woman in this study had gestational age between 33–36 weeks, and only one-third below 33 weeks. Wang et al. found that babies born at 35 week to 36 weeks and 6 days of gestation had hospital care cost that were significantly greater than term infants.<sup>14</sup> The increased neonatal morbidity associated with PPROM appears to be inversely related to gestational age.<sup>15</sup> The perinatal morality falls with advancing gestational age from 66% at 28–31 weeks to 20% at 34–36 weeks.<sup>16</sup> Woman with PPROM after 32 weeks of gestation should be considered for delivery and after 34 weeks the benefits of delivery clearly outweigh the risks.<sup>17</sup>

The current study showed common risk factors of the study population were history of coitus, CPD, infection and history of abortion which were 42.61%, 9.57%, 5.22% and 4.35% respectively.

Shrestha SR, Sharma P et al study revealed that 40% of women in PROM had history of sexual contact 2 weeks prior to delivery of baby.<sup>18</sup> These data on sexual contact in PROM group seems to be lower than 65% as mentioned by Kodkany and Telang.<sup>19</sup> Shrestha SR, Sharma P et al study on sexual contact in PROM group is similar with the data of 43% presented by Gautam.<sup>20</sup> Ekachai Kovavisarach et al did not find history of sexual contact two weeks prior to delivery as a significant risk factor.<sup>21</sup> The rate of CPD in Shrestha SR, Sharma P et al study (9%) is higher than as shown by Kodkany and associates. Percentage of hydramnios in this study is lower than 2% found by Gautam and 5% in the study by Kodkany.<sup>19,22</sup>

In this study majority 55.65% women had vaginal delivery, 44.35% had caesarian section. Gandhi M et al study showed normal vaginal delivery was the commonest mode of delivery (338 cases, 88. %), while instrumental delivery rate was only 0.5 % ( 2 cases) and caesarean section rate was 11.5% (44 cases). Shrestha SR, Sharma P study showed 70% spontaneous and 27% caesarean section delivery in PROM group. Anjana Devi found normal delivery in 42.5% among 104 patients in PROM group. They found caesarean section in 42.2%, which is much higher than our study. The rate of caesarean section in PROM group is higher than 13 % found by Gautam, 19% found by Sanyal and colleagues.<sup>22,23</sup> Caesarean section rate was 14% for Noor S et al study. This is comparable with the results of Tahir S et al, but is less than reported (20%) by Chales PJ (58.7%) and Kifas Al Qa.<sup>24-26</sup> This difference may be due to exclusion of cases of PPROM between 24–28 weeks of gestation At this gestation there are more chances of malpresentation hence delivery most of the time in this situation is by Caesarean section to decrease the chances of traumatic delivery. In present study common complication of mother were fever, postpartum hemorrhage, puerperial sepsis and anaemia which were 37.39%, 7.83%, 14.78% and 3.48% respectively. Noor S et al 44.71% had fever, Gandhi M et al study showed fever and anaemia was maternal complication.

This study showed out of 115 patients delivered 111(96.52%) babies born alive and 4(3.48%) were still birth. All babies had LBW, 33.91% were 1.0-1.5 kg, 42.61% were 1.5-2 kg and

23.48% were 2-2.5 kg. APGAR score 36.52% were <7. Common neonatal morbidity were severe birth asphyxia, Prematurity, Septicemia and Pneumonia 10.43%, 6.09%, 5.22% and 2.61% respectively. Neonatal death was 12(40.43%) and out of 12 cause of neonatal death 05 had severe birth asphyxia and 03 had prematurity and 4 had septicemia.

Majority of the babies born to PPRM group were in the very low birth weight category (53 cases 62.3%), whereas only 32 cases (37.6%) were of normal birth weight. APGAR score tells about the physical indicators of the new born. It is definitely affected by prematurity and low birth weight. It is significant in this study ( $p=0.01$ ). Infection and perinatal mortality was significantly associated with PPRM. In recent years substantial progress has been made in understanding the relation between maternal infection and preterm birth. Up to 80% of early preterm births are associated with intrauterine infection that precede the rupture of membranes.<sup>27</sup>

For patient with preterm PROM the most likely outcome is preterm delivery within one week with its associated morbidity and mortality risk such as respiratory distress syndrome, necrotising enterocolitis, intraventricular haemorrhage and sepsis.<sup>26</sup> The incidence of neonatal infection for infants born to women with PROM range from 1–2.6%.<sup>28</sup> In many studies it was found that the risk of neonatal infection was increased among mother colonised with group B streptococci, premature rupture of membranes >18 hours maternal fever during labour and prematurity.<sup>29</sup> Sita Ram Shrestha et al study showed incidence of neonatal infection in 24% cases in PROM and 1% cases in non PROM group.<sup>30</sup> This rate of infection is higher than as shown by Gautam.<sup>22</sup> But it is lower than as shown by an Indian study.<sup>16</sup> Among 24 cases of neonatal infection, septicemia was seen in 15 cases, pneumonia in 7 cases, meningitis in 2 cases. This data is similar with the data's presented by Anjana Devi et al, who showed septicemia in 11.5%, pneumonia in 5.8% and meningitis in 2.9% cases.<sup>9</sup> Chakraborty B et al study observed neonatal mortality of 10% in the very preterm group, neonatal mortality of 5%-12% among preterm rupture of membrane below 34 weeks.<sup>31</sup>

The limitations of the studies were - This study was conducted in only one center, and the sample size was small and study period was short.

## Conclusion

Common risk factors of the study population were history of coitus, CPD, infection and history of abortion. PPRM can be prevented avoiding the risk factors by proper ante natal check up, strict follow up, good obstetrical care and perinatal care, proper resuscitation of the baby after birth, making mass awareness of the sequelae. Further studies can be undertaken by including large number of patients at multi-centers.

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