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Original Article

The effect of Premature Rupture of Membranes (PROM) on maternal and neonatal health: A study of 50 cases

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ABSTRACT

***Background**: Rupture of the amnion and chorion before entering labor within 24 hours, resulting in vaginal discharge of amniotic fluid without uterine contractions, is known as premature rupture of membranes (RPM).* ***Objective**: The aim of this study was to know the effect of Premature Rupture of Membrane (PROM) on maternal and neonatal health.* ***Methods**: This was a cross-sectional study carried out in the Department of Obstetrics and Gynecology in Bangabandhu sheikh mujib medical university, Dhaka from February 2008 to July 2008. Total number of deliveries in this hospital were 778. This study was carried out on 50 pregnant women. All cases of PROM/PPROM above 28 weeks of pregnancy were admitted in Bangabandhu sheikh mujib medical university during the study period were included in this study.* ***Results**: The overall incidence of term PROM among study population was 6.42%. Mean age of the patients found to be 25.13 years. 54% cases with PROM were primigravida and 46% cases were multigravida. Gestational age in majority of the patients, 73% were >37 weeks. with Urinary tract infection (28%) was the common maternal disease associated with PROM. The most prevalent delivery method (64%) in our study was vaginal delivery. The overall maternal and fetal morbidity rate of our study was 30% and 34% respectively. Patients having prom more than 48 hours had a morbidity rate of 66.66%. Neonatal jaundice and neonatal sepsis were the two major morbidity which was 16.32% and 14.28%.* ***Conclusion**: The medical center has a lot of RPM. It is critical to guarantee population health education in general, and genital cleanliness in particular, as well as a consistent prenatal follow-up with a focus on the identification and treatment of genital infections, in order to prevent it.*

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Key words: *PROM, amnion, chorion*

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INTRODUCTION

Rupture of the amnion and chorion before entering labor within 24 hours, resulting in vaginal discharge of amniotic fluid without uterine contractions, is known as premature rupture of membranes (RPM) [1]. When PROM develops before 37 weeks of gestation, it is referred to as preterm PROM, while PROM that happens beyond 37 weeks of gestation is referred to as term PROM [2]. Preterm birth and perinatal morbidity are the most common outcomes of PROM. RPM affects 8-10% of full-term pregnancies [3]. It affects 4 out of 1000 babies worldwide [4]. It affects 2 to 3% of pregnancies in France before 37 weeks of amenorrhea (SA), or roughly 25,000 people every year [5]. Premature rupture of the membranes causes an increase in neonatal morbidity and mortality before 37 weeks, which is mostly associated to prematurity, the risk of neonatal infection, and the development of obstetric problems (retro-placental hematoma, cord procidence) [6]. It is responsible for more than 30% of preterm births and nearly 20% of perinatal mortality [7]. In different countries and populations, the magnitude of PPROM varies. It affects 3–4.5% of pregnancies worldwide [8]. PPROM accounts for 3.1% in Brazil [9], 2.2% in Manipur, India [10], 19.2% in China [8], 5.3% in Egypt [11], 3.3% in Nigeria [12], and 7.5% in Uganda [13], according to evidence.

PPROM's exact cause is unknown. However, different findings revealed that maternal ethnicity, previous adverse pregnancy outcomes, uterine over distention, smoking, low BMI, genitourinary tract infection, maternal depression, pre-pregnancy stress, poor diet, assisted fertility, and periodontal diseases are the major contributors to PPROM [14,15]. PPROM has a wide variety of consequences, from maternal and newborn mortality and morbidity to national economic loss due to drug costs, hospitalization, absenteeism from work, and health-care costs [16]. PROM is linked to a number of risk factors, including black race, poorer socioeconomic position, smokers, previous STI history, previous preterm delivery or abortion, polyhydramnios, and multiple pregnancy. Circumcision and amniocentesis are examples of other procedures [17,18]. The etiology is complex. PROM has been linked to membrane dysfunction at the molecular level [19], collagen dysfunction, and programmed cell death in fetal membranes [20].

In the case of RPM, the fetal prognosis is linked to gestational age; the older the gestational age, the better the prognosis. There is still a lot of work to be done in this situation to prevent maternal-fetal mortality during this tough time for expectant mothers. In the case of PMR, obstetric management focuses on preventing premature birth while also protecting the fetus against infection, which can lead to increased newborn mortality and maternal-fetal morbidity. In most circumstances, the RPM will arrive a few hours or days before the start of spontaneous work within 24 hours. It is, however, an infectious risk factor, particularly in the case of chorioamnionitis and newborn infections [21]. In the absence of clinically apparent intra-amniotic infection, fetal distress, or placental abruption, the main goal of conservative therapy in PPROM above 28 weeks has been to prolong pregnancy to lower the risk of

preterm [22]. As a result, the decision to forsake expectant womb treatment with PPROM in favor of delivery necessitates a careful comparison of the possible danger in expectantly treated pregnancies vs the gestational age-related risk for infant morbidity and mortality associated with purposeful delivery. Despite the fact that the majority of cases are idiopathic and unpreventable, diligent monitoring, prompt management, and a solid neonatal setup can considerably minimize fêto maternal morbidity and mortality.

OBJECTIVE

The aim of this study was to know the effect of Premature Ruptur of Membrance (PROM) on maternal and neonatal health.

MATERIALS AND METHODS

Study place and period: This was a cross-sectional study carried out in the Department of Obstetrics and Gynecology in Bangabandhu sheikh mujib medical university, Dhaka from February 2008 to July 2008.

Study population and sample size: Total number of deliveries in this hospital was 778. This study was carried out on 50 pregnant women. All cases of PROM/PPROM above 28 weeks of pregnancy were admitted in Bangabandhu sheikh mujib medical university during the study period was included in this study.

Inclusion criteria:

- Both primi and multigravid women with PROM.
- Gestational age more than 28 weeks of pregnancy duration.
- Spontaneous rupture of membrane before initiation of labour.

Exclusion criteria:

- Women who were admitted with rupture membranes with established labour
- Rupture of membranes with APH, severe pre-eclampsia, eclampsia.

Data collection: A systematic questionnaire was used to obtain data from the study population. The data was collected directly by questioning the patients and by physical examination, daily follow up of patients till their discharge and also from clinical research of the patients. The variables studied include the socio-demographic profile, the circumstances of admission, the characteristics of the pregnancy, the care and the maternal and fetal prognosis.

Data analysis: Clean coded data was input into Microsoft Excel and exported to SPSS version 22 for further analysis. The descriptive statistical analysis was described using sentences, graphs, tables, frequencies, percentages, and mean and standard deviation. The frequencies of the variables were used in a descriptive analysis, and the 95 % confidence intervals (CIs) were produced. The statistical analysis was omitted from questionnaires that were incomplete. In multivariable logistic regression, statistically significant was considered at $p < 0.05$.

RESULTS

During study period, total number of deliveries in this hospital was 778. Among them 50 Patients were included in this study based on inclusion criteria. The incidence of term PROM is 6.42%

Table 1: Incidence of PROM

Total number of patients	Number of PROM	Percentage (%)
778	50	6.42%

Among the 50 patients included in this study, 14% (07) were 15 to 19 years of age, 26% (13) were 20 to 24 years, majority 38% (19) were 25 to 29 years of age, 18% (09) were 30 to 34 years and only 4% (02) were 35 to 39 years old. Mean age of the patients found to be 25.13 years.

Table 2: Age distribution of the patients (n=50)

Age in years	Frequency (n)	Percentage (%)
15 to 19	07	14
20 to 24	13	26
25 to 29	19	38
30 to 34	09	18
35 to 39	02	04

In this study 54% cases with PROM were primigravida and 46% cases were multigravida. Gestational age in majority of the patients, 73% were>37 weeks.

Table 3: Incidence of PROM according to parity, gestational age

Variable	Frequency (n)	Percentage (%)
Parity		
Primigravida	27	54
Multigravida	23	46
Gestational age (weeks)		
28 to 36	14	27
≥37 to 42	36	73

In this study term PROM mothers were associated with Urinary tract infection (28%), lower genital tract infection (22%), and sexually transmitted disease (4%)

Table 4: Association of PROM with maternal disease

Variables	Frequency (n)	Percentage (%)
Urinary tract infection	14	28
Lower genital tract infection	11	22
Sexually transmitted disease	02	04
No associated disease	23	46

Among the study population, 64% (32) had spontaneous delivery and 36% (18) had induced delivery.

Table 5: PROM and mode of delivery

Mode of delivery	Frequency (n)	Percentage (%)
Spontaneous	32	64
Induced	18	36

In our study maternal morbidity rate was 30%. Maternal morbidity was found to be directly related with the time elapsed since PROM. Patients having prom more than 48 hours had a morbidity rate of 66.66%. Details shown in table 6 and table 7;

Table 6: Time of prom and maternal morbidity

Time elapsed since PROM	Number of patients	Patients developed morbidity	Percentage (%)
Within 12 hours	19	04	21.05
13 to 24 hours	12	03	25
25 to 48 hours	13	04	30.76
>48 hours	06	04	66.66

Table 7: Distribution of maternal morbidity

Types of morbidity	Frequency (n)	Percentage (%)
Puerperal sepsis	05	10
Wound infection	04	08
Postpartum hemorrhage	04	08
Retained placenta	01	02
Urinary tract infection	05	10

In case of fetal morbidity neonatal jaundice and neonatal sepsis were the two major morbidity which was 16.32% and 14.28% respectively. The feral morbidity rate was 34%.

Table 8: Distribution of fetal morbidity

Types of morbidity	Frequency (n)	Percentage (%)
Asphyxia	04	8.16
RTI	04	8.16
Neonatal jaundice	08	16.32
Neonatal sepsis	07	14.28
Still birth	01	02

DISCUSSION

It is difficult to precise the incidence of term PROM because it varies from country to country due to difference in antenatal care, accuracy in diagnosis of rupture membrane, epidemiological factors and health service delivery. Many studies [23, 24] have looked at various elements of the feto-maternal outcome in PROM cases. This research suggests that appropriate antenatal care, as well as early detection and prevention of obstetric problems, can enhance the feto-maternaloutcome.

In this study the incidence of term PROM was found to be 6.42%. a study conducted by Yasmina A et al, in

Morocco in 2017 found 6% and 8.2% was found in Israel in 2016 by Ashwal E etal [25,26]..Mean age of the patients found in our study was 25.13 years. Our data are comparable to that of Yasmina A et al, in Morocco in 2017 who reported an average age of 28.21 years [25].Increased sexual activity and vaginal infection are the most common among primigravida, according to Akhter et al [27]. In our study, 54% of the women were primigravida. Gestational age in majority of the study subject were ≥37 weeks in the current study. Similar findings were found by Adeniji AO, Atanda OA, and Biswas T et al in connection to gestational age [28,29].The prevalence of preterm PROM was found to be 27% in this study. Dan forth [30] found a 30% incidence of preterm PROM in his study.

In this study term PROM mothers were associated with Urinary tract infection (28%), lower genital tract infection (22%), and sexually transmitted disease (4%). Our results were supported by previous study conducted by Shehla Noor et al [31].The most prevalent delivery method (64%) in our study was vaginal delivery and induced delivery method was 2nd common method (36%).Which is comparable to 30% in kodkaneytelang et al study [32]. The overall maternal and fetal morbidity rate of our study was 30% and 34% respectively. Which is in agreement with the studies reported by Yoon et al [33], by Egarter et al [34].

CONCLUSION

Prom is not very infrequent in our regular hospital practice. With and increase of time taken for delivery after onset of PROM rate of both maternal and foetal complications increase many folds. Inadequate management further increase the number of adverse situations. UTI, lower genital tract infection, STD and maternal smoking may have some role in causing PROM which can be prevented. Maternal UTI, puerperal sepsis, surgical sire infection, neonatal sepsis and neonatal jaundice were the major morbidities associated with PROM. It is found that the earlier the delivery completed the less chance of maternal and neonatal complications.

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