Risk Factors of Premature Rupture of Membrane in A Tertiary Care Hospital, Bangladesh

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Abstract

Background : Premature Rupture of Membrane (PROM) is one of the most common complication of pregnancy. A woman with premature rupture of membrane is at risk of perinatal morbidity and mortality and also associated with maternal morbidity and psychological stress. Objective of this study was to determine incidence and risk factors of pregnant woman with PROM admitted in a tertiary hospital at Chattogram, Bangladesh.

Materials and methods : This prospective observational study conducted in the Department of Obstetrics and Gynaecology at Chattogram Maa-O-Shishu Hospital Medical College (CMOSHMC) Chattogram from 1stJanuary 2018 to 31st December 2018. In this period total admitted antenatal patients were 8117. Among the pregnant patients with PROM were 665 and their weeks of gestation were > 28 weeks. Data was collected by interviewer with semi structured questionnaire & check list.

Results : Incidence of PROM was 8.2%. PROM was found to be frequent (53%) in younger age group between 20-24 years. It was also commonly in primigravida (61.8%). Term PROM was higher (69.2%) than pre-term PROM (30.8%). 93.3% were singleton pregnancies, 6.4% were twins and .3% were triplets. Analysis of risk factors revealed ectiology was unknown in 46 (6.8%) low socioeconomic condition (60.6%), anaemia (45 %), lower genital tract infection (35.6%) UTI (31%) previous history of PROM (27.9%) malpresentation (15%) multiple pregnancy (6.7%) polyhydramnios (6%) history of recent coitus (12%) DM and GDM (10.5%) were commonly associated with PROM.

Conclusions : Early identification of various risk factors causing PROM and their management can prevent premature deliveries and its complications to some extent as well as serious maternal complication like Chorioamnionitis.

Key words : Premature rupture of membrane; Risk factors; Pragnancy.

INTRODUCTION

Premature Rupture of the Membrane (PROM) is a common obstetrics problem and the assessment of women with possible membrane rupture is a management issue faced in every day practice[1].

Worldwide, there is a slight difference in the prevalence of premature rupture of membranes and this could be due to the difference in the population studied. The incidence of PROM ranges from about 5% to 10% of all deliveries and PROM occurs in approximately 3% of all pregnancies. Approximately 70% of cases of PROM occur in pregnancies at term, but in referral centers, more than 50% of cases may occur in preterm pregnancies. PROM is the cause of about one third of all preterm birth[2].

PROM is a significant cause of perinatal morbidity & mortality. The burden of PROM ranges from maternal and neonatal mortality and morbidity to national economic loss due to drug expense, hospitalization, absence from the workplace and expense to the health professionals[3].

Prediction and prevention of PROM would offer the best opportunity to prevent its complications. The risk factors of PROM include prior preterm birth, cigarette smoking, polyhydramnios, urinary and sexually transmitted infection, prior PROM, work during pregnancy, low body mass index, bleeding, low socioeconomic status[3].

Previous studies to identify the risk factors of PROM were done at different countries. But the studies about identification of the risk factors of PROM in Bangladesh is very limited till now. Therefore we conducted the study to fill this gap by determining the risk factors of PROM.

MATERIALS AND METHODS

This prospective observational study was conducted at the Department of Obstetric and Gynaecology, CMOSHMC, Chattogram, Bangladesh, from 1st January 2018 to 31st December 2018. All the admitted pregnant patients with PROM were included in the study and all patient's weeks of gestations were > 28 weeks. In the study period total number of admitted antenatal patients were 8117. Among them pregnant patients with PROM were 665. Thorough history was taken followed by relevant clinical examination and some baseline investigations were done. All information were recorded in a structured questionnaire and check list.

RESULTS

During the 12 months of study, there were 8117 admitted pregnant patients, of which 665 cases of spontaneous PROM were seen, giving an incidence of 8.2% in our study.

Maximum cases belonged to age group 20-24 years (53%) & mean age of the patients were 24.8 years . Majority of the patients were housewife (73.7%). Most of the cases came from urban area (66.4%). Maximum (37.7%) patient's education level were up to secondary. PROM is extremely influenced by low socioeconomic status which was (60.6%) of cases in our study (Table I).

Table I : Demographic characteristics of the patients with PROM.

SL.	Variables	Category	No. of patients	Percentage
1	Age (Years)	15 – 19	23	3.4%
		20 – 24	359	54%
		25 – 29	195	29.3%
		30 – 34	67	10.08%
		>35	21	3.16%
2	Education level	Illiterate	108	16.2%
		Primary	149	22.4%
		Secondary	251	37.7%
		Higher secondary & above	157	23.7%
3	Occupation	Housewife	490	73.7%
		Employee	132	19.8%
		Others*	43	6.5%
4	Residence	Urban	442	66.4%
		Slum	93	13.9%
		Rural	130	19.7%
5	Socioeconomic status	Low	403	60.6%
		Middle	170	25.6%
		High	92	13.8%

*Student, Maid servant, Daily labor.

Majority of the patients were primigravida (61.8%) presented with term (>37 weeks) PROM (69.2%) & booked cases were (70.5%). The mean gestational age at the onset of membrane rupture was 34.1 weeks. Multiple pregnancy was (6.7%) among them twins & triplets were (6.4%) & (0.3%) respectively. Highest number of patients had previous history of PROM (27.9%). 15% patients had history of spontaneous abortion & 10% history of preterm delivery. Previous history of MR and D&C were 7.9% and 3.9% respectively (Table II).

Table II : Obstetric characteristics of the patients with PROM.

S.L No.	Variables	Category	Number of patients	Percentage
1	Gravidity	Primigravida	411	61.8%
		Multigravida	254	38.2%
2	Gestational age	28-36 weeks + 6 days	205	30.8%
		>37 – 42 weeks	460	69.2%
3	Antenatal care	Booked (at least 3 antenatal check up at least one in third trimester)	469	70.5%
		Un booked (<3 antenatal check up)	196	29.5%
4	Number of fetuses	Single	620	93.3%
		Twins	43	6.4%
		Triplets	2	0.3%
5	Past obstetric history	History of spontaneous abortion	95	14%
		History of PROM	186	28%
		History of preterm delivery	66	10%
		History of M.R	53	08%
		History of D&C	25	04%
		Nothing	240	36%

Regarding various risk factors associated with PROM in our study, most of the cases (46.6%) were unknown. Anaemia was the most (45%) important and common risk factors there after lower genital tract and urinary tract infection were 35.6% & 31% respectively. DM & GDM were 10.5%, increase frequency of coitus 12%, Malpresentation 15%, Multiple gestation 6.7%, Polyhydramnios 6%, pregnancy induced hypertension 13.5%, only 1 (0.15%) cases were cervical circlage in our study (Table III).

Table III : Risk factors of PROM.

S.L No.	Variables	Number of patients	Percentage
1	Idiopathic	310	46.6%
2	Anaemia	299	45%
3	Urinary tract infection	208	31%
4	Lower genital tract infection	237	35.6%
5	DM & GDM	70	10.5%
6	Increase frequency of coitus (Once / twice a week)	83	12%
7	Malpresentation	98	15%
8	Multiple gestation	45	6.7%
9	Polyhydramnious	38	6%
10	PIH	90	13.5%
11	Cervical circlage	1	0.15%

DISCUSSION

The cause of PROM is multifactorial. In our country true incidence of PROM is very difficult to ascertain because more than 80% deliveries occur at home. Incidence among such a small number of patients does not reflect the total hospital incidence of the nation. In our study incidence of PROM was 8.2%, of which term PROM 5.7% and preterm PROM 2.5%. Begum A et al, Choudhary M et al and Nazneen S et al in their study showed hospital incidence of PROM 9.05%, 9.8% and 6.3% respectively which were close to our study[4-6]. Another study done by Begum N reported an incidence of 9.04%. But almost similar rate (8.12%) was reported in a study done by Tasnim S[7,8]. Majority (53%) of the patients belonged to the age group 20-24 years which is similar to the studies done by Begum A et al, Nazneen S et al and Tasnim S[4,6,8].

Most of the patient's (73.7%) were housewife which was higher than the study showed by Assefa N et al which was 58.8%[9]. Most of the women in our country are housewife so the incidence is higher in comparison to their study.

Highest group of patient's (37.7%) education level was secondary level which is close to the study by Mohan S et al which was 40.2%[10]. In our study 66.4% patients came from urban, as it is a tertiary care private hospital. Which was close (65.4%) to the another study done by other private tertiary care hospital[11]. Low socio economic status is an important risk factor. In our study 60.6% patients came from low socio economic status

which was higher than the study done by Mohan S et al where it was 55.2%[10]. In the study done by Begum N, low socioeconomic status was 50%[7]. In present study maximum (61.8%) cases with PROM were primigravida which was almost similar (62.7%) and (53.33%) to the study done by lovereen S et al and Begum A et al respectively[12,4]. According to Akhter et al chance of increase sexual activity and increased genital infection are the most common among primigravida and in their study primigravida were 53%[13]. Incidence of preterm PROM in our study was 30.8% which was almost similar (29.09%) to the study by lovereen S et al[12].

Although it is widely accepted that aetiology of PROM are multifactorial. Our study shows that most of the causes are idiopathic (46.6%) which is similar to the study done by lovereenset al and in their study it was 47.3%[12]. Anaemia is one of the most important risk factors of PROM which is 45% in our study and almost similar (44.5%) to the study done by another private tertiary care Hospital but 26% and 16% was in the study done by Akhter S et al, Choudhary M et al respectively[13,1,5]. In our study lower genital tract infection was 35.6% which was almost near to the study done by another private tertiary care hospital where findings was 36.3%[11].

Another important risk factor of PROM is urinary tract infection which was 31% in our study and almost similar to the study done by another private tertiary care hospital and Begum A et al where prevalence were 31.8% and 33.33% respectively[11,4]. Anaemia, hypertension and diabetes are associated risk factors of PPROM by affecting nutrition and immunity of the patient produce PROM[14,15]. In our study incidence of PIH, DM & GDM are 13.5% and10.5% respectively, which is higher than the study of Choudhary M et al, Mohan S et al and Akhter S et al where incidence was PIH (13%) and DM (1.03%) (4%) respectively[5,10,1].

Malpresentation is also one of the common risk factors for PROM. In our study malpresentation was 15% which was consistent with the study of Choudhary M et al and Miller et al[5,16]. They found malpresentation 14% and 13.9% of PROM cases respectively. Delayed or non-engagement of presenting part causes transfer of increased pressure to fore water. This resulted in weakening of dependent part of membranes followed by rupture. Over distention of the uterus by either multiple gestation and polyhydramnios also increase the risk of PROM by increasing the intrauterine tension and in this study these were 6.7% & 6% respectively and which were consistent with the study of Choudhary M et al[5]. They showed that multiple gestation & polyhydramnios 7.5% and 6% respectively. Increased frequency of coitus (Once / twice a week) in last trimester increases risk of PROM by causing ascending infection (Specially in predisposed cases like anaemia, GU infection, cervical circlage or damaged cervix) as well as increases uterine activity through prostaglandins present in semen[5]. Our study, showed PROM in 12% cases, when history of recent coitus was present, which was consistent with

the study of Choudhary M et al where they found 11% of PROM with history of increased frequency of recent coitus[5]. In our study, previous history of PROM was 27.9%. Another important risk factors which was consistent with the study of Choudhary M et al, Mohan S et al, Lovereen S et al and Shehla N, they showed that previous history of PROM 29%, 28.6%, 16.3% & 30.6% respectively[5,10,12,17]. History of spontaneous abortion 15% which was almost similar to the study by Mohan S et al where it was 17.7%[10]. History of preterm delivery due to PROM is 10% which is similar to the study done by Akhter S et al and near to study done by Mohan S et al where it was 12.2%[1,10]. History of MR & D&C in our study 7.9% and 3.9% respectively which were consistent with the study of Akhter S et al where incidence were 8% and 4% respectively[1].

CONCLUSION

PROM is encountered to be one of the most common clinical events which turn a normal traditional pregnancy suddenly into a high-risk one for both the mother and the fetus.This study focused on risk factors in relation to PROM which can be preventable by proper health education, improved health hygiene, early diagnosis and treatment of genitourinary infections.

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DISCLOSURE

All the authors declared no competing interest.

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