Annals of International Medical and Dental Research
E-ISSN: 2395-2822 | P-ISSN: 2395-2814
Vol-7, Issue-4 | July-August, 2021
Page no- 207-215 | Section- Research Article (Obstetrics and Gynaecology)

Outcome of Premature Rupture of Membrane: A Clinical Study in 50 Cases in Enam Medical Collage and Hospital, SavarDhaka (EMCH)

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Received: May 2021
Accepted: June 2021

Abstract

Introduction: Premature rupture of members (PROM) is one of the common complications of pregnancy that has a major impact on fetal and maternal outcome. It is one of the commonest clinical events where a traditional pregnancy can turn into a high-risk situation for the mother as well as the fetus. Premature rupture of membrane is defined as spontaneous repute of the membrane before the onset of labour. **Aim of the study:**To determine the incidence of premature rupture of membranes in average patients admitted in Enam Medical Collage and Hospital,Savar Dhaka. **Methods:** This Cross sectional type of prospective study was conducted in the department of Obstetric Unit, Enam Medical Collage and Hospital Savar Dhaka. A total of 95 patients were included for the study according to following inclusion and exclusion criteria from the period of from November 2020 toApril 2021. The present study was conducted after receiving approval from the ethical review committee of (EMCH). **Results:** In this study out of 49 alive babies 22 (45.83%) were affected by the consequences of PROM and birth process. Among them, 36.36% development jaundice, 29.27% development birth asphyxia and 18.118% each developed RTI and neonatal sepsis. 15(%) babies were treated conservatively and 7 (%) babies were treated in neonatal unit after admission. There were no neonatal losses.The majorities of patients were primi (56%) and multiparity constituted (44%). Study shows that mode onset of labour was spontaneous in 30 (60%) cases of which 11 (39.29) cases were multi. Induction / Augmentation was done in 20 (40%) cases, among them 17 (60.71%) were primi& 03 (13.64%) were multi. The difference is highly significant; p value is P<0.001. **Conclusion:** Proper health education, motivation of patient, improved health hygiene, adequate maternity and childcare services, improved transport system are needed for reduction of morbidity and mortality.

Keywords: Outcome, PROM,Clinical Study

INTRODUCTION

Premature rupture of members (PROM) is one of the common complications of pregnancy that has a major impact on fetal and maternal outcome. It is one of the commonest clinical events where a traditional pregnancy can turn into a high-risk situation for the mother as well as the fetus. Premature rupture of membrane is defined as

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spontaneous repute of the membrane before the onset of labour. Rupture of the membranes before onset of labour at a gestation at age <37 completed weeks or before term which it is called pre-term premature rupture of membrances.[1] PROM occurs in is approximately 10.7% cases of all pregnancies. If 24 hours elapse between the rupture of the membranes and the onset of labour, the problem in one of prolonged premature rupture of the membrances.[2] Spontaneous rupture of the fetal membranes is a normal component of the course of labour. This usually occurs at the end of 1 stage of labour or beginning of 2ndstage of labour. It becomes a problem when it occurs earlier than its usual time of occurrence. It exerts unfavorable influence on labour and consequently on mother and fetus. The interval from the rupture of membranes to the onset of uterine contraction is defined as latent period.Premature rupture of membrane in preterm gestations (PROM) occurs in approximately 1% of all pregnancies and is often the initiating event leading to preterm birth, which is associated with high rate of neonatal morbidity and mortality.[1] Premature rupture of membrane complicates 4-7% of all births and is directly associated with short gestational length and increased perinatal and maternal morbidity.[3]Premature rupture of membrane (PROM) in the midtrimester (16 to 26 weeks) is infrequent, but it can occur either with or without bleeding and infection.[4] PROM occurs before 28 weeks gestation isassociated with marked oligohydramnios which may result in (the oligohydramnios sequence, including) fetal deformities and pulmonary hypoplasia (may develop[1]).The cause of PROM is multifactorial, infection appears to have an important role. Placentitis and chorioamnionitis have been associated with prematurity and PROM and are more frequently seen in pregnancies delivering before term. Ascending infection may frequently seen in pregnancies delivering before term. Ascending infection may result in weakening of the amniotic membrane and subclinical contractions leading to PROM, or may occur secondary to membrane rupture. Ascending infection may lead to occult deciduitis frank intra amniotic infection, or fatal infection including pneumonia and bacteraemia.[5]May nonmicrobial factors, including increased in amniotic pressure, multiple gestation, polyhydramnios nutritional deficiencies, preterm labour, and some others have been proposed as cause of PROM.Preterm premature rupture of membrane (PROM) is reported to occur in almost one-third of preterm deliveries (Savitz et al. 1991). Preterm infants born after prolonged rupture of membranes are at increased risk of death pulmonary hypoplasia, skeletal compression deformities and intrauterine infection (Blott et al. 1989; Rotschild et. al. 1990). Although the results from the Collaborative perinatal project (Nelson &Ellenberg 1986) indicate that chorioamnionitis is a strong risk factor for cerebral palsy, there are few data on infant neurodevelopmental outcome after prolonged membrane rupture[7].The management of preterm premature rupture of the membrane requires careful consideration of the risks and benefits for both the mother and fetus. Decisions will a depending on assessment of the relative influence of prematurity versus infection and oligohydramnios.When rupture of the membranes occurs before a gestational age of expected fetal viability, the decisions become even more challenging. Prolonging the pregnancy upto certain level that improves the chance of survivability is paramount for the fetus. However, there has been pessimism regarding the ability to accomplish this

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without undue risk to the mother and without subjecting the surviving neonates to substantial morbidity.[8] We should give attention to identify the major risk factors related to PROM and search for their remedy.This study was aimed to find out the effect of PROM on maternal and neonatal health so that we can pay more attention for the correct diagnosis and management of PROM can reduce the mortality and morbidity caused by PROM.

OBJECTIVES

- **General objective:**
  - Determine the incidence of premature rupture of membranes in average patients admitted in Enam Medical Collage and Hospital,Savar Dhaka.
- **Specific Objectives:**
  - Study the clinical profile of PROM in our patients.
  - Analyze the outcome of pregnancy in PROM.
  - To find out preventable factors affecting the outcome of pregnancy in PROM in our patients.

MATERIALS & METHODS

This Cross sectional type of prospective studywas conducted in the department of Obstetric Unit, Enam Medical Collage and Hospital, SavarDhaka(EMCH). A total of 95 patients were included for the study according to following inclusion and exclusion criteria from the period of from November 2020 to April 2021. Consecutive Randomize study. No sampling technique to be applied in this study. A structured question is to be developed & pre-tested before administration by the author. Data to be collected from pregnant mothers admitted in the inpatient department. Data was collected by directly questioning the patient & by physical examination; daily follow-up & noting down the APGAR score after delivery & also complications if any. Patients & her baby to be followed up till their discharge & also from clinical records of the patients. A trained laboratory technician of the department of pathology of BSMMU will collect blood samples from the patients on admission for assessing Hb level in gm/dl & serial lucocyte count. High vaginal Swab will be taken for bacteriological study.The collected data to be collected edited & coded. Developing a program in Epi-info Software data will be entered. The entered data will be analyzed using Epi-info & SPSS.

Inclusion Criteria

- Gravid woman, both primi& multi with rupture of membranes.
- Pregnancy of more than 28 weeks duraion.
- Spontaneous rupture of the membranes.
- Patients not in active labour.

Exclusion Criteria

- Patient having APH with active bleeding.
- Severe medical diseases (eg. Heart disease, renal disease)
- Severe pre-eclampsia, eclampsia
- Congenital malformation of the fetus.

RESULTS

In the present study the age of patients ranged between 15 and 39 years. Table ii shows age distribution of mothers with prom. Majority belonged to the age group 25-29 years (42%). Mean age of the patient was

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25.30 years. Table I. shows that most of the study patients are literate, out of the patients illiteracy constituted 04%, 24% cases had primary education and 72% cases had more than primary education. In this study prom occurred more among the education patients. Table I shows that housewife constituted majority (62%) cases series and all the working women (38%) had sedentary occupation. Study shows that majority (39) of the patient's belonged to lower and lower middle socio-economic group, which constituted 78% patients. Table II shows mother were associated with diseases among them, 56.66% had UTI, 36.66% had lower genital tract Infection, 06.66% has STD. Amongst 50 studied patient 32 (62%) were term PROM and 18 (38%) were PPROM. PROM is more in term gestational age group.

Table: III. Shows that majorities of patients were primi (56%) and multiparity constituted (44%). Study shows that mode onset of labour was spontaneous in 30 (60%) cases of which 11 (39.29) cases were multi. Induction / Augmentation was done in 20 (40%) cases, among them 17 (60.71%) were primi& 03 (13.64%) were multi. The difference is highly significant; p value is P<0.001. In this study out of 49 alive babies 22 (45.83%) were affected by the consequences of PROM and birth process. Among them, 36.36% development jaundice, 29.27% development birth asphyxia and 18.118% each developed RTI and neonatal sepsis. 15(%) babies were treated conservatively and 7 (%) babies were treated in neonatal unit after admission. There were no neonatal losses.

Table I: Age distribution, Socio-economic&DiagnosisCharacteristicsof the patients (N =50)

Characteristics	**Number of patients**	**Percentage**
Age (Years)		
15-19	7	14
20-24	13	26
25-29	21	42
30-34	6	12
35-39	3	6
Education		
Illiterate	2	4
Primary education	12	24
Higher education class VI-X	4	8
S.S.C	6	12
H.S.C	8	16
Graduate & Above	18	36
Occupation		
House wife	32	62
Service	18	38
Monthly income (Take)		
Up to 5000	17	34
5000-10000	22	44
10000-15000	8	16
>15000	3	6
Diagnosis		

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PROM with pregnancy >37 weeks	60	7.74
PROM with pregnancy 34-37 weeks	30	3.87
<34	5	0.65

Table-II: Associated maternal diseases (n=50)

Associated diseases	**Number of patients**	**Percentage**
With Associated diseases	30	60
Urinary tract infection (UTI)	17	56.66
Lower genital tract infection	11	36.66
Sexually transmitted diseases (STD)	2	6.66
With Associated diseases	20	40

Table-III: Different types of Incidence (n=50)

Diagnosis	**Number of patients**	**Percentage**
Incidence of PROM patients according to Gestational age		
Term PROM	32	62
Preterm PROM	18	38
Incidence of parity		
Primi	28	56
2nd	9	18
3rd	6	12
4th	4	8
>5th	3	6

Incidence of mode onset of labour					
Gravid	**Mode of delivery**				
	NVD		**C/S**		
	No	**%**	**No**	**%**	**P value**
Primi	10	20%	18	36%	0.05
Multi	14	28%	8	16%	
Total	24	48%	26	52%	

Table – IV: Time interval between rupture membranes and delivery (n=50)

Duration between Prom & Delivery (Hours)	**Number of patients**	**Percentage**
<12	19	38
24-48	16	32
24-48	5	10
>48	10	20

Table V: Distribution fotal outcome (n=49) Still born=1

Diseases	**No (%)**	**Conservative**	**Admission No. (%)**
No morbidity	27		

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Morbidity	22 (45.83%)		
Asphyxia	6 (29%)	4 (18.18%)	2 (9.09%)
RTI	2 (18.18%)	1 (4.54%)	3 (13.63%)
Jaundice	8 (36.36%)	6 (29.27%)	2 (9.09%)
Neonatal sepsis	4 (18.18%)	4 (18.18 %)	0 (0%)

DISCUSSION

Premature rupture of members (PROM) is one of the common complications of pregnancy that has a major impact on fetal and maternal outcome. It is one of the commonest clinical events where a traditional pregnancy can turn into a high-risk situation for the mother as well as the fetus. Premature rupture of membrane is defined as spontaneous rupture of the membrance before the onset of labour. Rupture of the membranes before onset of labour at a gestation at age <37 completed weeks or before term which it is called pre-term premature rupture of membrances[1]. However, PROM is very often seen in the obstetric wards, we face problem in diagnosis, monitoring and adopting treatment policy. There were very limited studies about PROM in our country and no national statistics is available about the incidence of PROM or incidence of maternal and perinatal mortality and morbidity from PROM. This study will not help us to estimate the incidence of PROM in our country because the study was done in hospital (95% of delivery in Bangladesh occur at home) and being of short period. The incidence of PROM is not clear in other countries also. PROM occurs in is approximately 10.7% cases of all pregnancies[2]. Incidence of pPROM is approximately 1%.[1]In this study, conducted in BSMMU, Dhaka shows the hospital incidence of PROM as 12.25 percent 60 percent of PROM cases occur in term pregnancy and 40 percent occur in preterm pregnancy. These results are not very different in comparison to other studies: 6-19 percent,[2] 5-10 percent[18] 1 and 2.7-17 percent.[28] Dr. Tasnim S.[33]in her study showed hospital incidence of PROM as 8.12% at DMCH in 1995. In this study mean age of PROM was found 25 ± 4 years, which is similar to other study by Michael Morettiet. At,[4] Begum and Choudhury[32] and Dr. Tasnim S[33] In this study, incidence of PROM was more in prime (56%). According to hospital statistics, proportion of multigravida was more than primegravida. Michael Morettiet at showed 71%[4] and Begum and choudhury showed incidence in multi about 70%.[32] PROM in a prior pregnancy is an identified risk factor for PROM Occurrence of abortion or MR in previous pregnancy may increase the risk for PROM. Post abortal or puerperal infection, which may be responsible to harbour the microorganism in endocervix and contribute to PROM. Others association of PROM with multigravida may be explained by the presence of associated risk factor like previous history of M.R and D&C, preterm delivery, history of PROM and history of abortion. 36.35% of PROM in this study gave a history of previous abortion Cervico-vaginal infection is most common etiological association of PROM. The facility of anaerobic culture is limited in our facility. In this study, incidence of positive aerobic HVS culture was high 36%. Most common microorganism found was E. coli 10(20%). Theresult was obtained after 72 hours, clinical evidence of chorioamnionitis was found in 36% patients. The recurrence rate in this study was 18.18% compared to 21%

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shown by Naeyee.[15] Maternal diseases has impact on PROM In this study 30% of PROM cases had associated medical diseases Among that 53.33% has UTI, 40% lower genital tract infection and 06.66% patient had STD. Microorganism responsible for matemal infection produces interleukins and tumour necrosis factor, which trigger Prostaglandin production by the amnion and induce prematurelabour and rupture of membrane.[13] Coitus increases chance of PROM & said to be a significant risk factor which may facilitate microbial entrance into the upper reproductive tract. This study shows significant correlation in between sexual behavior & PROM. About 68% PROM cases reported sexual intercourse within one week. The number of vaginal examination influences the risk of the infection after PROM, potential pathogens present in the vaginal flora & antibacterial activity of the amniotic fluid. Most of the patients 85% with term pregnancy and PROM will go into labour spontaneously. Multiparous women had a greater percentage of chorioamnionitis present study then the primiparous mother. It may be that bacteria invading the endocervix are more often harboured there. Begun and Choudhury[32] in here study showed maternal morbidity as 29% and Puerperal sepsis were about 21.6%. Dr.Delawara[34] in her study showed maternal morbidity, as 47% of which chorioamnionitis was 31% and Puerperal sepsis was 7%. In this study there was no matemal death. There is reduction of incidence of Puerperal sepsis then two studies 32& 34, this may due to use of combination antibiotic therapy for PROM patients. BraimM.Mercer, Kristopher L. Arheart in their study showed antimicrobial therapy reduces both chorioamnionitis and Puerperal sepsis. Regarding perinatal outcome, among 50% PROMcases 28(57.14%) babies were born with Apgor score >7 & 27 (55.10%) Of babies had weight >2500gm, 21(42.86%) babies had weight between 1500-2500gm & 01(2.04%) of babies had weight between 1000-1500gm. In this study 27th babies of PROM patients has no abnormality and 22(45.83%) had various type of morbidity and stillbirth 1(2%). There was no neonatal death among the patient studies during hospital stay. Hospital stay following delivery of PROM cases short. Because of scarcity of hospital beds PROM patients with normal delivery were discharge earlier and follow-up of patients were not possible after theirdischarge. So real number of morbidity and mortality cannot be estimated from this study. We need both hospital and community based large-scale study on PROM to know exact incidence of PROM and effect of PROM on maternal and neonatal health.

Limitation of the study:

Sample size was limited and follow-up period were short in comparison to other studies. The study was conducted in a selected institute, so the study population might not represent the whole community.

CONCLUSION

PROM creates great hazard both for the fetus and mother. The clinical course of PROM is usually characterized by increased maternal and fetal morbidity. The ultimate goal of management must be towards the safety of mother and optimum perinatal outcome. The principal cause of PROM is till obscure. Relations of PROM with some risk factors were found in this study e.g. Coitus, recent history of abortion, M.R., D&C, PROM and maternal diseases. This study was done with small population but it allows letting us know certain risk factors, which can be preventable. When patients present with

prolonged rupture of membrane, chance of infection morbidity is higher. Earlier the patient reach to the hospital with least intervention outside, better is the outcome. Appropriate antibiotic coverage in appropriate time will reduce both maternal and fetal infections morbidity. Proper health education, motivation of patient, improved health hygiene, adequate maternity and childcare services, improved transport system are needed for reduction of morbidity and mortality.

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Source of Support: Nil, Conflict of Interest: None declared