Original Article

Study on Preterm Premature Rupture of the Membrane Among Primigravida

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Abstract:

Background: When membrane ruptures before 37 completed weeks of pregnancy, known as preterm premature rupture of the membrane (PPROM). It is one of the serious complications of pregnancy. It creates hazards both for the mother & fetus. Continuation of pregnancy for fetal maturation & selection of mode of delivery is very important. The ultimate goal of management must be towards the safety of mother and optimum perinatal outcome. Early diagnosis of rupture membrane before term, better obstetrical treatment, improved neonatal management facilities will help us to improve the outcome in preterm PROM.

Materials & method: This cross sectional observational type study was conducted in department of Obstetrics & Gynae in CMH, Barishal. All primi gravid patients with preterm PROM were included according to inclusion & exclusion criteria. Multi gravid patients with PROM & patient of PROM with APH were excluded from this study.

Results: Out of 65 patients, 33 patients (51%) experienced rupture membrane between 35 to <37 weeks gestation and 80% patients delivered within 24 hours. 68%(44 cases) patients delivered per vaginally and 32% (21 cases) patients needed caesarean section. 02 patients (3.07%) developed chorioamnionitis, 05 patients (7.7%) developed puerperal sepsis & 09 patients (13.85%) developed post partum hemorrhage. Fetal outcome in 65 cases of preterm PROM reveals hypoxia & RDS both in 08 cases (12.3%) and neonatal mortality was 7.7% (05 cases).

Conclusion: Preterm rupture membrane can turns a normal pregnancy to high risk case specially when the gestational age is too small. Continuation of pregnancy is usually indicated for fetal lung maturation. But it could be safely allowed so long the mother & fetus do not develop any complications like chorioamnionitis, cord compression, oligohydramnios, sepsis, fetal distress, FGR (fetal growth restriction). Judicious selection of timing and mode of delivery is crucial for management.

Key words: preterm premature rupture of the membrane, fetal growth restriction

Introduction:

When membrane ruptures before onset of labour, called premature rupture of the membrane (PROM).[1] Usually this occurs near term. If this happens before 37 completed weeks of pregnancy called preterm premature rupture of the membrane (PPROM). Incidence of PPROM ranges from 3.0 % to 10% of all deliveries.[2,3,4] 3% of all pregnancies may be complicated by PPROM and one third of preterm birth are due to this.[5] 1 in 10 births may be affected by preterm birth, which is more in developing countries and 40-75% neonatal deaths are due to this.[6] Preterm PROM results in preterm delivery, which is

responsible for both high perinatal mortality, morbidities and maternal morbidities.[7]

Many factors lead to accelerated membrane weakening resulting in rupture membranes. Inflammatory cells release enzyme proteases, matrix metalloproteinases which increase collagenase activity to degrade collagen, the major structural component of fetal membrane.[8] Another risk factors are uterine over distension, H/O rupture membrane in previous pregnancy, cervical incompetence, genital infection like herpetic lesion in cervix, bacterial vaginosis, urinary tract infection, below average nutrition status.[9,10,11] Amniocentesis, drug abuse (especially cocaine use), alcohol use, poor nutrition status, smoking, may cause preterm PROM.[12] In a study it has been found that PPROM were more in young mother group, age between 15-25 yrs and giving birth to their 1st child.[13]

Escaping of amniotic fluid from cervical os during vaginal speculum examination is the most confirmatory diagnosis of PROM. If vaginal Ph found > 6.0 or ferning on microscopic examination indicate presence of amniotic fluid in vagina.[14]

Severity of oligohydramnios, duration of pregnancy during rupture membrane and latency period affect fetal morbidities & mortality. Chorioamnionitis increase chance of caesarean delivery due to poor labour progress and can cause maternal blood stream infection. The risk of abruption placenta from preterm PROM is between 4 and 12 percent which can cause maternal hemorrhage leading to maternal death.[15] Prematurity, neonatal sepsis, cord compression, fetal distress, neurological disorder, fetal limb deformation, pulmonary hypoplasia, necrotizing enterocolitis(NEC) ; these are neonatal complications of preterm rupture membranes.

Appropriate timing & selection of mode of delivery is very crucial for management. Continuation of pregnancy is usually indicated for fetal maturation.

Materials and Methods:

This cross sectional observational type study was conducted in department of Obstetrics & Gynae in Combined Military Hospital, Barishal over a one year period from April 2024 to March 2025. All primi gravid patients (total 65) with preterm PROM between 28 weeks gestation to less than 37 completed weeks gestation were included in this study. Multi gravid patients with PROM & patient of PROM with APH were excluded from this study. This study was started by taking approval of the study from the ethical committee. All the patients who were enrolled for the study were briefly described about the purpose of the study & informed written consent was taken. Data collection involved the use of a pre-designed structured proforma to record demographic details such as name, age, address, socioeconomic status, gestational age, delivery interval, mode of delivery. Complications, outcomes and results were reported accordingly. Collected data were compiled and statistical analyses were done using Statistical Package for Social Science (SPSS) software.

Results:

This study was conducted on 65 primi gravid patients who had ruptured membranes before 37 completed weeks. Among them 44.61% were between 20-24 years & 31% were below 20 years age group. 58.46% (38 patients) belonged to low socio economic condition which is associated with poor nutritional status.

Table-I: Socio-demographic characteristics of the participants

Variable	Frequency n=65	Percentage
Age in years		
< 20	20	30.77
20-24	29	44.61
25-30	16	24.61
Socioeconomic condition		
Low	38	58.46
Middle	21	32.30
Upper	06	9.23

Among 65 patients 33 patients (51%) had ruptured membranes between 35 to < 37 weeks of gestation, 26 patients (40%) between 31 to 34 weeks of gestation & only 06 patients (9.23%) < 30 weeks of gestation. Majority of patients (80%) delivered within 24 hours of developing PROM & 67.7% (44 patients) delivered per vaginally.

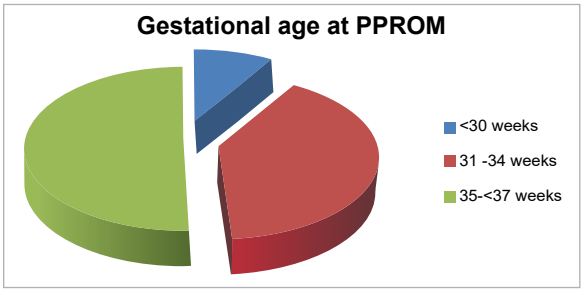

Figure-1: Gestational age at rupture membrane

Table-II: Delivery interval & mode of delivery

Variable	Frequency n=65	Percentage
Interval of PPROM & delivery (in hours)		
<24	52	80
24-48	08	12.30
>48	05	7.7
Mode of delivery		
Vaginal delivery(VD)	44	68
Caesarean section (CS)	21	32

Among 65 patients, 08 cases (12.3%) had multiple pregnancy, 06 cases (9%) had polyhydramnios. Two patients developed chorioamnionitis, 05 patients puerperal sepsis & maternal mortality was nil.

Fetal outcome in 65 cases of PPROM revealed neonatal hypoxia in 08 cases, respiratory distress syndrome (RDS) in 08 cases. 29 babies were ≤ 2 kg, 12 babies had birth weight ≥2.5 kg & death occurred in 05 cases, where 03 cases were multiple pregnancy.

Table-III: Fetal outcome

Variable	Frequency n=65	Percentage
Birth weight (in kg)		
≤ 2	29	44.61
2.1-<2.5	24	36.92
≥2.5	12	18.46
APGAR SCORE		
<7	12	18.46
>7	53	81.54
Fetal morbidities		
Fetal hypoxia	08	12.3
RDS	08	12.3
Neonatal jaundice	05	7.69
Congenital anomaly	03	4.6
Death	05	7.7

Discussion:

Premature rupture of the membranes is responsible for neonatal mortality, various morbidities and maternal complications. Intrapartum fetal distress, cord prolapse, prematurity, neonatal sepsis, abruptio placenta are complications following rupture membrane.[16,17] In this study 58.46% patients are from poor socio-economic status, 32% belonged to middle class & 9% belonged to higher class. In a past study,[18] among 85 patients, poor class were 68.23%, middle class were 29.41% and 2.3% belonged to higher socioeconomic group which is similar to this study.

Incidence of neonatal sepsis is about 1%, if mother had rupture membrane >24 hrs duration. These chance increase with duration of PROM. It may increase from 3% to 5% in presence of signs symptoms of chorioamnionitis.[19] In this study 80% patients delivered within 24 hours of developing PROM, 02 cases (3%) developed chorioamnionitis and 05 cases (7.7%) developed puerperal sepsis.

Markus L et al. in Tanzania in 2013 observed frequency of PROM was 11% in multiple pregnancy. In this study, 12.3% patients of PROM had multiple pregnancy.

Preterm birth is the most common outcome of preterm PROM which results in various neonatal morbidities & mortality. Respiratory distress, pulmonary hypoplasia, neurological disorder, necrotizing enterocolitis (NEC), IVH & sepsis are major risks.[20] In this study 44.61% baby born with ≤ 2 kg weight, 18.46% born with ≥2.5 kg weight, birth asphyxia in 08 cases (12%), RDS 08 cases (12%), neonatal jaundice in 05 cases and neonatal death was 05(7.7%).

In another study, among 27 cases of preterm PROM, 4% cases were fetal distress, 9% cases were hypoxia and mortality was nil.[21] As this study was conducted in a tertiary care centre, due to extreme prematurity of some case, neonatal morbidities and mortality has been found more than previous study. Preterm PROM often cause cord prolapse, oligohydramnios resulting in fetal cord compression, which often needs early delivery by caesarean section when there has been chance of fetal survibility. In this study, out of 65 patients, 21 needed caesarean section (32%). In a study 29.57% cases needed C/S[22] which is mostly similar to this study.

Conclusion:

There is association of low socioeconomic condition with incidence of premature rupture of membranes which is associated with increased neonatal morbidity due to oligohydramnios, cord compression, hypoxia, pulmonary hypoplasia at the time of delivery. An appropriate and timely accurate diagnosis & management of PROM will allow optimize perinatal outcome and minimize neonatal mortality & morbidity.

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