PREVALANCE OF PPROM AND ITS OUTCOME

Shehla Noor, Ali Fawwad Nazar*, Rubina Bashir, Ruqqia Sultana
Department of Gynaecology Unit 'C', *Department of Pathology, Ayub Medical College, Abbottabad

Background: Prematurity is the leading cause of perinatal morbidity and mortality in developed as well as in underdeveloped countries. In one third of the patients with preterm labour there is associated premature rupture of membranes. This prospective observational study was carried out in Ayub Teaching Hospital to determine the prevalence of preterm premature rupture of membrane (PPROM) and its association with the demographic risk factors and its outcome. **Method:** There were 889 deliveries in Gynaecology 'C' unit from September 2005 to March 2006. Out of these, 85 patients were confirmed to have PPROM. Detail history and examination along with the demographic risk factors were recorded on a performa. Every patient was followed till her delivery and the mode of delivery and maternal and foetal outcome was recorded. **Result:** Prevalence of PPROM in this study was 16%. It was seen to be common among patients who were young (15–25 years) 58.8%, with low socioeconomic status (68.2%), and with an educational status of primary to middle (71.7%). Risk of PPROM was seen to be highest among patients giving birth to their first child (42.2%), with gestational age between 30–35 weeks (43.5% cases) and 35–37 weeks (35.2%). In 69.4% cases there was no previous history of preterm deliveries while in 30.6% cases, there were one, two, or more previous preterm deliveries. Normal vaginal delivery occurred in (65.86%), while instrumental delivery rate in PPROM was 20% and caesarean section rate was 14%. Postnatally 16.47% patients developed infection while 24 (28.2%) babies developed infection and required antibiotics. Majority of babies born to patients with PPROM were low birth weight (62.3%), and 30.5% babies required neonatal intensive care. Perinatal mortality rate was 129.9/1000 (13%) of total births. **Conclusion:** PPROM is an important cause of preterm birth, resulting in large number of babies with low birth weight, requiring neonatal intensive care. It is associated with increased foetal morbidity and mortality. Demographic variables can be applied to develop risk scoring so as to identify high-risk cases and treating them in time to prevent ascending infection along with its complications.

Key words: Preterm premature rupture of membrane, PPROM, preterm birth

INTRODUCTION

Preterm premature rupture of membranes is one of the leading identifiable causes of prematurity. Rupture of membranes before 37 weeks of pregnancy can result in preterm birth in about 30% of cases. It complicates about 3% of all pregnancies and occurs in approximately 150,000 pregnancies yearly in the united states.[1] Preterm birth occurs in 11% of all pregnancies and is responsible for majority of neonatal deaths and nearly one half of cases of congenital neurological disability, including cerebral palsy.[2] The direct costs of prematurity are immense. Lewit and colleagues estimated that the cost of health care, education, and child care for those born at low birth weight is about 6 billion US $, (1988 $ higher) than for those of normal weight up to 15 years of age.[3]

MATERIAL AND METHODS

From September 2005 to March 2006 all patients who presented with preterm premature rupture of membranes to out-patient department as well as to the labour room of Gynaecology 'C' unit were included. Preterm premature rupture of membranes was defined as rupture of membranes before 37 completed weeks of gestation. After taking consent, detailed history and examination was performed. Demographic and obstetrical data was recorded on a performa. Preterm premature rupture of membranes were confirmed if on sterile speculum examination, there was amniotic fluid seen draining through the cervical os along with reduced amniotic fluid index on ultrasound. In equivocal cases nitrazine test was performed for confirmation.

Patients with congenital anomalies, multiple pregnancy, pre-eclampsia, eclampsia, diabetes mellitus, polyhydramnios, intrauterine growth restriction, placental abruption along with those who presented with preterm premature rupture of membranes at term were excluded.

All patients with PPROM were admitted in the maternity ward. They were either put on conservative management if no sign of infection was present or active management was done if any sign of infection was present. All patients with PPROM were put on broad-spectrum oral antibiotics if not in labour and injectable antibiotics if in labour.

The criteria for maternal infection was temperature >38 °C with one or more of the following signs, uterine tenderness, foetal or maternal tachycardia or foul smelling amniotic fluid draining

pervaginum in the absence of any obvious reason for elevated temperature.

The criteria for foetal infection was foetal temperature >38 °C, on at least two occasions four hours apart, requiring antibiotic therapy.

Patients were followed till their delivery and postnatally and data regarding mode of delivery, foetal weight, APGAR score and neonatal outcome was recorded on the performa.

Main outcome measures were prevalence of preterm premature rupture of membranes before 37 weeks. Its association with maternal demographic and obstetrical variables along with mode of delivery, low birth weight perinatal morbidity and mortality and maternal morbidity.

RESULTS

A total of 889 deliveries occurred from September 2005 to March 2006. Total number of patients with PPROM were 85, leading to prevalence of 9.6%.

Table-1 shows number of PPROM with mothers' age, gestational age, sociodemographic and mothers' educational status. Majority of patients were young with age less than 35 years. It was more frequent in patients with gestational age between 30–35 weeks (37 cases, 43.5%) and between 35 to 37 weeks (30 cases, 35.2%). PPROM was frequent among patients belonging to low socioeconomic class (58 cases, 68.2%), while it was infrequent among patients belonging to high socioeconomic class (2 cases, 2.35%). It was common among patients who were educated up to primary and middle (61 cases, 71.7%) or were uneducated (19 cases, 22.3%).

Table-1: Number of PPROM cases with mothers' age, period of gestation, socio-economic and educational status. (n=85)

	Number	%
Age group		
15-25 years	50	58.8
26-35 years	20	23.5
36-45 years	15	17.6
Gestational age in weeks		
.Up to 30 weeks	8	58.8
Up to 35 weeks	37	43.5
Up to 37 weeks	30	35.2
Socioeconomic status		
Low	58	68.2
Middle	25	29.4
High	2	2.35
Maternal education		
Nil	19	22.3
Primary/middle	61	71.7
High	5	5.88

Table-2 shows the relationship of obstetrical profile of the patient with PPROM and mode of delivery. PPROM was common among patients who were pregnant for the first time (38 cases, 44.7%) and was least common among grand multigravadae (7 cases, 8.2%). Majority of patients had no previous history of preterm deliveries (59, 69.4%) while 8 cases (9.4%) had one or more previous preterm deliveries. Normal vaginal delivery was the commonest mode of delivery (56 cases, 65.86%), while instrumental delivery rate was 20% (17 cases) and caesarean section rate was 14% (12 cases).

Table-2: Obstetrical profile of the patients along with mode of delivery

	Number	%
Obstetrical profile		
Primigravida	36	42.3
Multigravida	28	32.9
Grand multigravida	7	8.2
Previous pre-term deliveries.		
Nil	59	69.4
One	8	9.4
Two	10	11.76
More	8	9.4
Type of delivery		
Vaginal delivery	56	65.86
Instrumental delivery	17	20.0
Caesarean section	12	14.0

Table-3 shows the antenatal morbidity and association of pelvic examination with PPROM. Majority of patients presented at the time when they were afebrile (47 cases, 55.2%), while 38 patients (44.7%) presented with fever of 38 °C or more. Pelvic examination had been performed by some LHV or midwife in 20 patients (23.5%) before reporting to the hospital while in 65 (76.4%) patients no previous pelvic examination had been performed.

Table-3: Perinatal maternal morbidity

	Number	%
Presence of fever		
Fever present	38	44.7
Fever absent	47	55.3
Previous pelvic examination		
Not performed	65	76.5
Performed	20	23.5

Table-4 shows the neonatal and perinatal outcome of the babies. Total 53 (62.3%) babies born to mothers with PPROM were low birth weight which include 10 (11.76%) babies of extremely low birth and 30 (35.29%) babies of very low birth weight. Twenty-six (30.5%) babies were born with low APGAR score and required neonatal intensive care. Five (5.88%) babies had intrapartum death while 11 (12.9%) babies had neonatal death, resulting in perinatal mortality of 129.9/1000 births.

Table-5 shows the postnatal foetal and maternal morbidity. Twenty-four (28.2%) babies developed fever and required injectable antibiotics

while 14 (16.47%) mothers required injectable triple antibiotic regime.

Table-4: Neonatal outcome and perinatal outcome

	Number	%
Birth weight		
1.0-1.5 kg	10	11.76
1.6-2 kg	30	35.29
2.1-2.5 kg	13	15.29
2.6-3 kg	30	35.29
3.1 & more	2	2.35
Delivery outcome		
Delivered dead	5	5.88
Alive	80	94.12
APGAR score		
Below normal	26	30.5
Normal	59	69.4
Perinatal outcome		
Neonatal death	11	12.9
Remained alive	74	87.05

Table-5: Postnatal maternal and foetal morbidity

	Number	%
Maternal infection present	14	16.47
Maternal infection absent	71	83.5
Foetal infection present	24	28.2
Foetal infection absent	61	71.7

DISCUSSION

The prevalence of PPROM in this study is 9.6% which is higher than reported in England (1%),[4] United States (1–2%),[5] Canada (2–3%)[6] and Punjab (5.4%).[7] Lack of education, poverty, living at high altitude, poor nutritional status of women in this area, and improper utilization of available health resources may be the causes of this high prevalence. Nutritional deficiencies that predisposes women to abnormal collagen structure have also been associated with an increased risk of preterm premature rupture of membranes.[4] In addition, no screening programme is being carried out in the area to detect and treat women suffering from genitourinary tract infections during pregnancy.

Recent controlled trials demonstrated that significant number of preterm births could be prevented in women considered to be at risk or normal risk for preterm birth by screening and treating bacterial vaginosis in pregnancy.[8] Hiller *et al*[9] reported that there was a 40% increase in low birth weight infants born to women with asymptomatic, untreated bacterial vaginosis. Thus Preterm birth along with its associated morbidity can be cost effectively reduced by screening and treating common genitourinary tract infections and bacterial vaginosis during pregnancy.

Demographic variables associated with PPROM were lower maternal age, null parity, low socioeconomic class and lack of maternal education which are similar to those reported in other studies.[10-12]

In our study about 44.7% patients were running fever of 38 °C or more at the time of admission. All patients were given broad spectrum antibiotics. Intrapartum fever accompanied by two or more additional signs including foetal tachycardia, uterine tenderness, foul smelling vaginal discharge or maternal leukocytosis occurs in 1.0% to 3.8% of parturient and is associated with neonatal Group B Streptococcal (GBS) attack rates from 6% to 20% cases.[5] Reports of three meta analysis of randomised blind studies showed that initiating systemic antibiotics after occurrence of PPROM had two major effects: first, increased latency (time until delivery) and second, reduced occurrence of neonatal sepsis, interventricular haemorrhage and perinatal mortality and chorioamnionitis.[13-15]

Caesarean section rate in this study was 14% which is similar to that reported in the study from Punjab.[7] It is very low as compared to the study by Charles P J *et al*[16] in which the incidence of caesarean section was 58.7%. In our study caesarean section was mostly performed for foetal distress and malpresentation, while in the above-mentioned study caesarean section before labour was the most frequent mode of delivery. This is because of cultural differences in this part of the world where large families and vaginal deliveries at home are preferable.

In our study, 30.6% cases had previous preterm deliveries. This incidence is higher than reported by Tahir *et al*[7] (14.7%) and Charles P J *et al*[16] (14.3%). Thus risk scoring strategies can be developed on the basis of prior preterm birth. However the use of the scoring systems has resulted not in significant reductions in preterm births but rather in an increased use of intervention with unproved effectiveness.[17]

The number of low birth weight babies in this study was 62.3% which is very high as compared to United States (1991) and California (1992) birth cohorts in which the prevalence of prematurity was 10.3%.[5] This large number of low birth weight babies puts great burden on the neonatal intensive care facilities. Number of babies with low APGAR score who required advanced resuscitation were also high (30.5%). Perinatal mortality in this study was 13% (129/1000 births), which is lower than reported by Tahir *et al* but higher than reported by Multer *et al* (9.3%)[18] and by Charles P J *et al*[16] (3% at 28–31 weeks and 0.41 % at 32–33 weeks).

In this study 28.2% of babies and 16.47% of mothers developed infection despite the administration of antibiotics. In the study by Ananth[15] prophylactic antibiotic use was associated with reduced perinatal morbidity, neonatal sepsis, endometritis and chorioamnionitis. The largest study to date, as well as meta analysis of studies has also

demonstrated that antibiotic treatment reduces the risks of maternal chorioamnoinitis, neonatal respiratory distress syndrome and neonatal sepsis.[19-20]

Foetal death does occur in approximately 1% of patients with PPROM who have been expectantly managed but again in our study this incidence was quite high (5.88%). This is because of lack of monitoring and one to one nursing facilities.

CONCLUSION

PPROM is one of the important causes of preterm birth that can result in high perinatal morbidity and mortality along with maternal morbidity. Looking after a premature infant puts immense burden on the economic and health care resources of the country; therefore risk scoring strategies involving the demographic variables along with previous history of preterm deliveries should be developed to identify high risk cases and treating them prior to rupture of membranes.

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Address for Correspondence:
Dr. Shehla Noor, Assistant Professor, Department of Gynaecology, Unit 'C', Ayub Medical College, Abbottabad-22040, Pakistan. Tel: +92-3348959229
Email: drshehlanoor@yahoo.com