FOETOMATERNAL OUTCOME IN PATIENTS WITH OR WITHOUT PREMATURE RUPTURE OF MEMBRANES

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Background: Preterm premature rupture of membranes is responsible for one third of all preterm births and is associated with significant maternal, foetal and neonatal risks. The objectives were to compare the foeto-maternal outcome in patient with and without preterm premature rupture of membranes. **Method:** This prospective comparative study was conducted in Gynae-C Unit of Ayub Teaching Hospital from Sep 2005 to Mar 2006. Total 170 cases were recruited in the study, out of which 85 had Preterm Premature Rupture of Membranes (PPROM), and 85 had preterm labour without PROM. Patients' data were recorded on a performa. Maternal outcome was measured on the basis of presence of fever and mode of delivery. Foetal outcome was measured on the basis of weight of the baby, and presence of infection (fever), APGAR score and neonatal death. Analysis was performed using SPSS-10. **Results:** The primary data arranged in groups was divided into PPROM and no-PPROM groups. The PPROM was found to be frequent in younger age group between 15–25 years while no-PPROM was common among the age group between 26–35 years (p=0.002). Lower socioeconomic class and history of previous one or more preterm delivery was significantly associated with PPROM (p=0.001). Maternal fever was also significant in the PPROM group (p=0.01). Low birth weight was statistically significant in the PPROM group. Majority of the babies born to mother were either extremely low birth weight or low birth weight, i.e., between 1–25 kg p-value 0.005. Low APGAR score at the time of delivery (p=0.01) and foetal infection (p=0.002) between the PROM and no-PPROM group was found to be statistically significant Neo-natal deaths was also higher in the PPROM group as compared to no PPROM group (11 verses 2) (p=0.009). **Conclusion:** In our study premature rupture of membrane had increased neonatal morbidity and mortality as compared to preterm birth. Strategies should be developed for its prevention.

Keywords: Preterm Premature rupture of membranes, PPROM, Preterm birth

INTRODUCTION

Preterm premature rupture of the membranes (PPROM) is responsible for one third of all preterm births and affects 120,000 pregnancies in the United States each year. Sub clinical intrauterine infection has been implicated as a major etiological factor in the pathogenesis and subsequent maternal and neonatal morbidity associated with PPROM.[1] As much as two third of the perinatal mortality and a half of long term neurological disabilities including cerebral palsy, are associated with a preterm birth. Infants are born preterm following spontaneous labour with intact membranes (45% of cases) preterm membrane rupture is (30%) and after labour induction or caesarean delivery for maternal or foetal indications (25%).[2] Birth following spontaneous preterm labour and spontaneous preterm premature rupture of the membranes (PPROM) together called spontaneous preterm birth are considered a syndrome caused by multiple aetiologies, including infection/inflammation, vascular disease, uterine over distension and immunological disorders.[3]

Objective of this study was to compare the fetomaternal outcome in patients with preterm premature rupture of membranes and those without preterm premature rupture of membranes but with preterm labour.

MATERIAL AND METHOD

This study was conducted in Gynae-C Unit of Ayub Teaching Hospital from September 2005 to March 2006. During this period 845 antenatal cases were seen in the OPD. A total of 170 cases were included in the study out of which 85 had pregnancy with PPROM while 85 patients were randomly selected who did not have PPROM but had preterm labour. After taking consent patients' demographic variable and obstetrical history were recorded on a performa.

PPROM was confirmed if on sterile speculum examination there was liquor draining along with reduced amniotic fluid index on ultrasound. Patients were followed up till their delivery and postnatally, and data regarding mode of delivery, foetal weight, foetal APGAR score, weight and neonatal outcome were recorded on the performa. Any Pregnancy complicated by PPROM between 28 to 36 completed weeks was included. Pregnancies before 28 weeks of gestation and any complication of pregnancy other than PPROM that affects foetal and neonatal outcome, e.g., IUGR, diabetes, foetal malformation, pre-eclampsia were excluded. Patient were admitted in the ward and put on conservative management if there was no sign of infection (i.e., increasing maternal pulse, evidence of increase in temperature or foetal distress). Two doses of Betamethasone 12 mg I/M, 12 hours apart were given to

enhance lung maturation. Prophylactic antibiotics were given to all patients who were diagnosed to have PPROM. Maternal monitoring to detect evidence of chorioamnionitis was done by six hourly pulse, temperature record, abdominal tenderness, colour and smell of liquor and record of foetal heart rate and cardiotocography. Chorioamnionitis was detected if patient had a temperature 100.4 °F or more, abdominal tenderness foul smelling liquor maternal and foetal tachycardia. If any evidence of clinical chorioamnionitis was detected then conservative management was abandoned in favour of immediate delivery.

Maternal outcome was measured on the basis of presence of fever, mode of delivery. Foetal outcome was measured on the basis of weight of the baby, presence of infection (fever) APGAR score, and neonatal death.

From the primary data obtained tables were made and interpreted. Data was applied in the SPSS-10, and statistical values of mean, *p*-value, significance value and their correlation was obtained.

RESULTS

Total number of deliveries conducted at the Unit during study period was 889, out of this number 85 patients presented with preterm premature rupture of membranes. Another 85 patients were recruited randomly as controls who did not present with PPROM but had preterm labour. The demographic data of the subjects is presented in Table-1.

The primary data was arranged in 2 groups, i.e., PPROM and no-PPROM groups. PPROM was found to be frequent in younger age group, i.e., 50 patient were in the age group between 15–25 years, while no-PPROM was common among the age group between 26–35 years, i.e., 40 patients (p=0.002). Patients who presented with PPROM had gestational age mostly between 30–35 (37 cases), and 35–37 weeks (30 cases), (p=0.001). Patients with PPROM belonged to lower socioeconomic class (58 cases) as compared to middle and upper class (25, and 2 cases respectively), (p=0.001). Correlation of education with PPROM was not found to be statistically significant (p=0.594) as majority of patients who presented with PPROM had education level up to primary and middle, while those in no-PPROM group were uneducated.

Thirty-eight patients with PPROM and 22 patients with no-PPROM had fever, while 47 patients of PPROM and 63 patients of no-PPROM were a febrile, (p=0.01). PPROM was frequent among patients who were pregnant for the first time and had their first delivery (38 and 36), but the correlation of gravidity and parity was not statistically different between the PPROM and no-PPROM groups, (p=0.735 and 0.697 respectively).

There were total 26 patients with previous one or more preterm deliveries who presented with PPROM, while only 6 patients in the no-PPROM group had a history of previous preterm deliveries (p=0.001). Majority of patients in the PPROM and no-PPROM group had vaginal deliveries, and only 12 patients of PPROM group and 7 patients of no-PPROM group underwent caesarean section for obstetrical indications, (p=0.071).

Table-2 shows the foetal outcome. Majority of babies born to mothers with PPROM were either extremely low birth weight, or low birth weight. Majority of babies (41) with no-PPROM were average birth weight. Twenty-six babies in the PPROM group while 12 babies in the no-PPROM group had low APGAR score at the time of delivery (p=0.010).

Correlation of foetal infection between the PPROM and no-PPROM group was found to be statistically significant (p=0.002). Neonatal deaths were also higher in the PPROM groups as compared to no-PPROM group (11 vs 2, p=0.009). There was no significant difference between the two groups in cases in whom previous pelvic examination was performed or not.

Table-1: Maternal demographic variables

Parameter	PPROM	No-PPROM	*p*
(**Age** (Years)			
15–25	50	20	0.002**
26–35	20	40	
36–45	15	25	
Gestational age			
Up to 30 weeks	8	25	0.001**
31 to 35 weeks	37	30	
36 to 37 weeks	30	38	
Socioeconomic Status			
Low	58	37	0.001**
Middle	25	38	
High	2	10	
Maternal Education			
Nil	19	44	0.594
Primary/Middle	61	16	
Matric and above	5	25	
Parity			
Nil	38	25	
Para 1	6	15	0.735
Multipara (2–5)	26	38	
Grandmultipara (>5)	15	9	
Gravidity			
Primigravida	36	19	
2nd Gravida	5	16	0.697
Multigravida (3–5)	23	36	
Grandmultigravida (>5)	7	6	
Fever			
No	47	63	0.010*
Yes	38	22	
Previous Pelvic Examination	65	74	0.075
No	20	11	
Yes			
Preterm deliveries			
Nil	59	79	
One	8	3	0.001**
Two	10	1	
More than 2	8	2	
Type of Delivery			
Vaginal Delivery	56	67	0.071
Assisted Delivery	17	11	
Caesarean Section	12	7	

*Significant at 0.05, **Significant at 0.01, NS= Not Significant

Table-2: Neonatal outcome

Parameter	PPROM	No-PPROM	*p*- Value
Birth weight			
1.0–1.5 Kg	10	0	
1.6–2 Kg	30	23	
2.1–2.5 Kg	13	21	0.005**
2.6–3 Kg	30	41	
3.1 and more	2	0	
Outcome			
Delivered dead	5	1	0.097 NS
Alive	80	84	
APGAR Score			
<7	26	12	0.01**
≥7	59	73	
Infection			
No infection	61	77	0.002**
Infection present	24	8	
Perinatal death			
Neonatal death	11	2	0.009**
Remained alive	74	83	

*Significant at 0.05, **Significant at 0.01, NS= Not Significant

DISCUSSION

Spontaneous preterm birth is customarily defined as any delivery following either spontaneous preterm labour or PPROM. Even though these events are defined as distinct entities, there is considerable evidence that the risk factor for their occurrence is similar and the distinction may be largely a matter of semantics. Most preventive strategies for spontaneous preterm birth target both condition.[2]

To date no strategies have been identified that reduce the occurrence of preterm birth after PPROM, thus most pregnancies complicated by PPROM end in preterm birth.[2]

Preterm pre-labour ruptures of membranes (PPROM) complicates up to 2% of all pregnancies and is the cause of 40% of all preterm birth.[4]

In our study Prevalence of PPROM was 9.5% which is higher than reported by Smith G *et al.*[5] and Tahir[6], i.e., 2.3% and 5.4% respectively.

This high prevalence can be explained by the cultural influences of early marriages, poverty, gender discrimination resulting in low maternal weight gain and lack of birth spacing. In our study lower maternal age, and low socioeconomics class were significantly associated with PPROM as has been reported earlier.[6–8]

Although education was not statistically significant between the PRROM and no-PRROM group but is implicated as the cause of preterm birth in many studies. Patients' education might also help to reduce the incidence of preterm birth.[9]

Previous history of miscarriages and preterm delivery was statistically significant as has been reported in other studies.[10,11] Two-thirds of woman in this study had gestational age between 33–36 weeks, and only one-third below 33 weeks. Wang *et al*. found that babies born at 35 week to 36 weeks and 6 days of gestation had hospital care cost that were significantly greater than term infants.[12] The increased neonatal morbidity associated with PPROM appears to be inversely related to gestational age.[5]

The perinatal morality falls with advancing gestational age from 66% at 28–31 weeks to 20% at 34–36 weeks.[13] Woman with PPROM after 32 weeks of gestation should be considered for delivery and after 34 weeks the benefits of delivery clearly out weigh the risks.[1]

Caesarean section rate was 14% for this study. This is comparable with the results of Tahir S *et al*[6], but is less than reported (20%) by Chales PJ[14] (58.7%) and Kifas Al Qa.[15] This difference may be due to exclusion of cases of PPROM between 24–28 weeks of gestation At this gestation there are more chances of mal-presentation hence delivery most of the time in this situation is by Caesarean section to decrease the chances of traumatic delivery.

Majority of the babies born to PPROM group were in the very low to low birth weight category (53 cases 62.3%), where as only 32 cases (37.6%) were of normal birth weight. In the no-PPROM group the figure for low birth weight cases were 44 (51.76%). We must admit that this is also a very huge percentage, though it is considerably less than the figure of PROM group. In a way this shows the dismal health position of mother and child in our part of the world.

APGAR score tells about the physical indicators of the new born. It is definitely affected by prematuraity and low birth weight. It is significant in this study (p=0.01).

Infection and perinatal mortality was significantly associated with PPROM. In recent years substantial progress has been made in understanding the relation between maternal infection and preterm birth. Up to 80% of early preterm births are associated with intrauterine infection that precede the rupture of membranes.[16]

For patient with preterm PROM the most likely outcome is preterm delivery within one week with its associated morbidity and mortality risk such as respiratory distress necrotising enterocolitis, intraventricular haemorrhage and sepsis.[15] The incidence of neonatal infection for infants born to women with PROM range from 1–2.6%.[17] In many studies it was found that the risk of neonatal infection was increased among mother colonised with group B streptococci, premature rupture of membranes >18 hours maternal fever during labour and prematurity.[18]

CONCLUSION

Preterm premature rupture of membranes ends in preterm birth. It is significantly associated with low socioeconomic status and presence of maternal fever. It is associated with increased neonatal morbidity and mortality due to low birth weight, low APGAR score at the time of delivery, subsequent foetal infection and

increased neonatal death rate as compared to preterm birth without rupture of membranes. Strategies should be developed for its prevention.

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