SOCIODEMOGRAPHIC PROFILE AND OUTCOME IN WOMEN WITH PRETERM PREMATURE RUPTURE OF MEMBRANES IN A TERTIARY CARE CENTRE

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ABSTRACT

BACKGROUND

Preterm premature rupture of membranes (PPROM) occurs in less than 3% of deliveries and contributes to one third of preterm deliveries and is a major contributor for obstetric morbidity and adverse perinatal outcome. PPROM is multifactorial in aetiology with several risk factors postulated including maternal infections. The obstetric outcome is also dependent on these risk factors.

MATERIALS AND METHODS

This was a prospective analytical study conducted in Department of OB/GYN, Government Medical College, Thrissur over a period of two years. 160 cases of singleton pregnancies presenting as PPROM between gestational age of 24 to 36 weeks were assessed for their sociodemographic factors and followed up for their obstetric outcome including latent period, mode of delivery, obstetric complications and perinatal outcome.

RESULTS

On analysing the complications, it was found that 11.25% of patients developed chorioamnionitis as a consequence of PPROM compared to an incidence of 3.1% (166 out of 5205) patients out of the total deliveries (chi square 30.4, p value 0.0000). 7.5% had antepartum haemorrhage in which two third (67%) were detected to have placenta praevia on ultrasound while one third (33%) were diagnosed with abruptio placenta compared to 3.86% of APH in the total population (201 out of 5205) (chi square 53.8, p value 0.02). Cord prolapse occurred in 1 patient (0.6%) with PPROM, in which baby was stillborn (chi square 1.94, p value 0.16) when compared to 2 cases of cord prolapse in the total number of patients delivered (0.4%). 13.1% of patients in this study developed postpartum haemorrhage with 4.1% requiring blood transfusion compared to 5.15% of PPH in the total population (268 out of 5205) (chi square 19.3, p value 0.00001).

CONCLUSION

PPROM is a significant contributor of poor obstetric outcome. Many of the contributing factors of PPROM if detected sufficiently early and appropriately treated may not only decrease the onset of PPROM, but also have the potential to reduce the complications.

KEYWORDS

Preterm Premature Rupture of Membranes (PPROM), Obstetric Outcome.


Staphylococcus. The other major risk factors implicated are cigarette smoking, vaginal bleeding and previous preterm delivery. Black race, low socioeconomic status, cervical incompetence, congenital tissue disorders, nutritional deficiencies, abnormal placenta, polyhydramnios, and multiple gestation have also been implicated. Genetic factors like polymorphisms of MMP 9 have also been linked.6

Intrapartum complications associated with PPROM are cord compression leading to foetal distress, cord prolapse, and placental abruption. Intrauterine infection can lead to chorioamnionitis and endometritis after delivery. Perinatal outcomes constitute prematurity, neonatal sepsis, respiratory distress syndrome (RDS), intraventricular haemorrhage (IVH), risk of foetal and neonatal death. Antibiotics have been used in reducing infectious infant morbidity.7 Corticosteroids can reduce many neonatal complications particularly respiratory distress syndrome and intraventricular haemorrhage.8

Expectant or conservative management with prolonged continuous foetal and maternal monitoring combined with modified bed rest to increase the opportunity for amniotic fluid re-accumulation is said to improve outcomes.9
MATERIALS AND METHODS

This was a prospective analytical study conducted in the Department of OB/GYN, Govt. Medical College, Thrissur, Kerala. 160 cases of singleton pregnancies complicated by PPROM between gestational age of 24 to 36 weeks managed in the hospital were recruited in the study after getting consent. Congenital anomalies, multiple pregnancy, gestational diabetes, severe preeclampsia, polyhydramnios and foetal deaths were excluded from the study. Institutional approval for the study and its proforma were obtained following standard institutional research committee procedures. Detailed history and examination was performed and recorded. History of previous pregnancy complications and mode of delivery, details of current pregnancy including gestational age, any complications, frequency of antenatal visits, evidence of urogenital infections, periodontal infections, antepartum haemorrhage were noted. PPROM was confirmed by a sterile speculum examination by visualising amniotic fluid draining through the cervical os along with reduced AFI on USS. The patients were observed for clinical symptoms of chorioamnionitis such as fever, uterine tenderness, maternal tachycardia, foetal tachycardia, and laboratory investigations (Leucocytosis-CRP-ESR). A high vaginal swab was taken in all patients at the time of admission. All patients received antibiotic prophylaxis according to standard protocol. Antenatal corticosteroids (12 mg of betamethasone, 2 doses, 24 hours apart) were given to all patients. The patients were observed for at least 12 hours in the labour room for any symptoms of bleeding, contraction, or foetal distress. Patients who did not enter into active phase or those did not show any complications were transferred to the obstetrics unit for expectant management. Clinical chorioamnionitis, gestational age >34 weeks, haemorrhage and foetal distress were taken as indication for induction of labour. Latency of labour defined as the period between membrane rupture to the point of delivery was recorded.

**RESULTS**

**Sociodemographic Profile**

Majority of patients in this study were in the age group 20-24 years with the mean age of 26 years. Majority of patients with PPROM belonged to the low socioeconomic category, with 143 patients (89.4%) coming in the Below Poverty Line. About 76% of patients resided in the rural area compared to 24% in the urban area. In this study, most of the women presenting with PPROM were housewives (81%) and working women constituting the remaining 19%.

Foetal and neonatal outcome like intrauterine death, early neonatal death (First week), signs of Respiratory Distress Syndrome (RDS), and signs of neonatal sepsis (Blood or CSF culture positive during the first 72 hours after birth) were noted.

Mothers were observed in postnatal period for pyrexia, foul smelling lochia and wound infection. Mothers and babies were followed up till the date of discharge.

Data were analysed using Epi Info Statistical software version 3.4 and expressed in its frequency and percentage.

### Table 1. Socioeconomic Profile

<table>
<thead>
<tr>
<th>Age in Years</th>
<th>&lt;20 Yrs.</th>
<th>20 – 24 Yrs.</th>
<th>25 – 29 Yrs.</th>
<th>30 – 34 Yrs.</th>
<th>≥35 Yrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socio-economic Status</td>
<td>Below Poverty Line</td>
<td>Above Poverty Line</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Place of Residence</td>
<td>Rural</td>
<td>Urban</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupation</td>
<td>Housewife</td>
<td>Labourer</td>
<td>Skilled Labour</td>
<td></td>
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</tr>
</tbody>
</table>

### Table 2. Obstetric Profile

91 among the 160 patients (56.9%) were referred from the peripheral hospitals and were booked outside. Only 5.6% were unbooked patients. Of these 85 patients (53.1%) were primi and 75 (46.9%) were multigravidae. Majority of the patients i.e. 127/160 (79.4%) had regular antenatal checkups.

Looking into the previous pregnancy complications, it was found that 53 patients among the 160 had complications like first trimester abortion in 32 patients (20%), preterm delivery in 13 patients (8.1%), PPROM in 6 patients (3.8%). Two patients (1.3%) had cervical encerclage done in their previous pregnancy.

<table>
<thead>
<tr>
<th>Booking Status</th>
<th>Booked</th>
<th>Booked Outside</th>
<th>Un-booked</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parity</td>
<td></td>
<td></td>
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<tr>
<td>Primi</td>
<td>60 (37.5%)</td>
<td>91 (56.9%)</td>
<td>9 (5.6%)</td>
</tr>
<tr>
<td>Para 1</td>
<td>85 (53.1%)</td>
<td>59 (36.9%)</td>
<td>15 (9.4%)</td>
</tr>
<tr>
<td>Previous Pregnancy Complications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First trimester miscarriage</td>
<td>32 (20%)</td>
<td>2 (1.3%)</td>
<td>6 (3.8%)</td>
</tr>
<tr>
<td>Cervical Encerclage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urinary Tract Infection</td>
<td>3 (1.9%)</td>
<td>21 (13.1%)</td>
<td>33 (20.6%)</td>
</tr>
<tr>
<td>Abnormal Vaginal Discharge</td>
<td></td>
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<td></td>
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<tr>
<td>Antepartum Haemorrhage</td>
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<td></td>
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<tr>
<td>Periodontal Infection</td>
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<td></td>
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<tr>
<td>Present Pregnancy Events</td>
<td></td>
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<tr>
<td>Antenatal Visits in Present Pregnancy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irregular Visits</td>
<td>33 (20.6%)</td>
<td>127 (79.4%)</td>
<td></td>
</tr>
<tr>
<td>Regular visits</td>
<td></td>
<td></td>
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<tr>
<td>Gestational Age at Onset of PPROM</td>
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<td></td>
<td></td>
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<tr>
<td>24-28 Weeks</td>
<td>29-33 Weeks</td>
<td>34-36 Weeks</td>
<td></td>
</tr>
<tr>
<td>11 (6.9%)</td>
<td>44 (27.5%)</td>
<td>105 (65.6%)</td>
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</tr>
</tbody>
</table>
On analysing the present pregnancy events, among the 160 patients, 21 patients (13.1%) had UTI, 33 patients (20.6%) had abnormal/increased discharge per vaginum, 12 patients (7.5%) had antepartum haemorrhage and 48 patients had periodontal infection (30%). Three patients (1.9%) had undergone cervical encerclage in this pregnancy, of which one was history indicated and 2 of them were ultrasound indicated.

Majority of the patients, 105 among the 160 (65.6%) developed PPROM between 34-36 weeks. Of the remaining, 44 patients (27.5%) developed PPROM between 29-33 weeks while only 11 patients (6.9%) presented with very early PPROM between 24-28 weeks.

Duration of hospital stay was less than 7 days in 81 cases (50.6%), 7-14 days in 52 cases (32.5%), 15-21 days in 14 cases (8.8%), 22-28 days in 11 cases (6.9%) and more than 28 days in 2 cases (1.3%).

There were 157 live births (98.1%), one still birth (0.6%) and two intrauterine deaths (1.3%). The birth weight was less than 2.5 Kg in 146 babies (11.25%) and more than 2.5 Kg in the remaining 14 babies (88.75%). APGAR score at 5 minutes was less than 8 in 28 babies (17.5%), and 8-10 in the majority, that is 132 babies (82.5%). Babies who were admitted in neonatal ICU were 97 (60.6%). There were 17 neonatal deaths (10.6%).

DISCUSSION

The total number of obstetric admissions in our hospital during the study period were 5365 out of which 160 were PPROM cases. The prevalence of PPROM was 2.98%, which accounts for 12.5% of all preterm deliveries which is similar to the study by Noor S et al which showed a prevalence of 16%.

The mean age of women in this study was 26 years with 41.3% of the patients in the age group 20-24 years. In the study group, 53.1% of patients were primiparous. Obi SN and Ozumba et al in their study reported that PPROM was highest in primiparous patients. 56.9% of patients in this study were booked outside or referred from peripheral hospitals while 37% were booked in the institution and 6% constituted unbooked patients. In this study, 76.3% of patients belonged to rural population. Majority (89.4%) were of low socioeconomic status. Ferguson et al in his study reported that PPROM is associated with low maternal haemoglobin and low socioeconomic status. 20.6% had irregular antenatal checkups during the current pregnancy. 3.8% of patients had PPROM in their previous pregnancies and 8.1% had a history of preterm labour similar to the observations made in various other studies which reported a 5.5 times increased risk of recurrence. In our study, 1.3% of patients had underwent cervical encerclage in their previous pregnancy and 20% had a history of first trimester abortion.

Abnormal discharge per vaginum indicating the presence of cervicovaginal infection and Urinary tract infection was reported in 20.6% and 13.1% patients respectively. Pathogens were isolated in 15% of patients which may have contributed to the onset of PPROM as reported in many studies implicating vaginal infection and UTI. Presence of infections may affect the tensile strength of membrane resulting in PPROM. 30% of patients with PPROM were found to have periodontal infections which is also reported to be a significant high risk factor by Goldenberg et al. PPROM
occurred following cervical encerclage in 1.9% of patients in the study group. The mean gestational age at rupture of membranes in this study was 32.28 weeks with the majority (65.6%) occurring between 34-36 weeks. The latency period between onset of membrane rupture to delivery was less than 24 hours in 38% of patients. The mean gestational age at delivery in this study was 34 weeks and the mean latency period between PPROM and delivery was 3.8 days.

On analysing the complications, it was found that 11.25% of patients developed chorioamnionitis as a consequence of PPROM compared to an incidence of 3.1% (166 out of 5205) patients out of the total deliveries (chi square 30.4, p value 0.0000). The rates of chorioamnionitis were found significantly higher in the PPROM group compared with women without PPROM (16.5 vs. 2.7%) in a study by Furman et al. 7.5% had antepartum haemorrhage in which two third (67%) were detected to have placenta praevia on ultrasound while one third (33%) were diagnosed with abruptio placenta compared to 3.86% of APH in the total population (201 out of 5205) (chi square 5.38, p value 0.02). Cord prolapse occurred in 1 patient (0.6%) with PPROM, in which baby was stillborn (chi square 1.94 p value 0.16) when compared to 2 cases of cord prolapse in the total number of patients delivered (0.04%).

13.1% of patients in this study developed postpartum haemorrhage with 4.1% requiring blood transfusion compared to 5.15% of PPH in the total population (268 out of 5205) (Chi square 19.3, p value 0.0001). 3.8% required manual removal for retained placenta. In a study of PPROM between 18 - 23 weeks by Verma U and Goharkhay16 in 2006, the incidence of retained placenta was 7% and postpartum haemorrhage 9%. The incidence of postpartum fever in this study was 15%. 10% of patients developed wound infection.

The overall neonatal survival was 87.5% in this study with perinatal mortality of 12.5%.

CONCLUSION
PPROM is a significant contributor of poor obstetric outcome. Currently, there is no effective way of preventing spontaneous rupture of foetal membranes due to its multifactorial aetiology. Many of the contributing factors of PPROM if detected sufficiently early and appropriately treated may not only decrease the onset of PPROM, but also have the potential to reduce the complications.

REFERENCES