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Original Research Article

## Study of maternal and fetal outcomes in premature rupture of membrane in central rural India

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### ABSTRACT

**Background:** Premature rupture of membrane is linked to significant maternal prenatal mortalities and morbidity. The maternal and fetal outcomes in PROM is very important to decrease maternal and child mortality and for better management and prevention of complications. Thus, this study aimed to detect the maternal and fetal outcomes in patients with PLROM at tertiary care hospital in central rural India.

**Methods:** This prospective study was conducted in Department of obstetrics & Gynecology, in a tertiary care institute located in central India, over a period of 18 months. 210 patients were diagnosed with PLROM and all of them were included in the study. The data of these women were collected using a checklist based on registration books.

**Results:** The rate of maternal morbidity was 26%, commonest cause was clinical chorioamnionitis (11.9%) followed by febrile illness seen in 10.5%. No maternal mortality was seen in the study. Perinatal morbidity was seen in 30% of cases. Clinical early onset neonatal infection was the commonest cause for perinatal morbidity noticed in 23.8% of cases (50 out of 210). Perinatal mortality observed was 1.43% (3 out of 210). Birth asphyxia being the commonest cases of mortality.

**Conclusions:** Major maternal morbidity is chorioamnionitis (11.9%). Major perinatal morbidity observed is early onset neonatal infection (24%).

**Keywords:** Fetal outcomes, Maternal outcomes, Premature rupture of membrane

### INTRODUCTION

Under normal circumstances, fetal membranes rupture during the active phase of labor. Once the membranes rupture the integrity of pregnancy is in jeopardy. Many complications like preterm labor, prolonged labor, dry labor chorio-amnionitis (CAM), congenital pneumonia, neonatal infection and even death of neonate might occur. It is common obstetric problem and one of the most common clinical event where a traditional pregnancy can turn into a high-risk situation for mother as well as fetus.

PLROM is a major cause for prematurity which leads to increase perinatal morbidity and mortality. Obi (2007) and Liu (2009) however have found in their separate

studies in developing countries that incidence of PLROM is around 18-20%.<sup>1,2</sup> Preterm prelabor rupture of a membranes (PPLROM) occurs in 1-5% of all pregnancies. It is responsible for approximately 30-40% of all preterm birth.

Preterm delivery is the cause of 85% of neonatal morbidity and mortality. There are numerous possible fetal consequences of preterm delivery due to PLROM like respiratory distress syndrome, hypothermia, hypoglycaemia, jaundice, necrotizing enterocolitis, intraventricular haemorrhage, neurologic impairment, apnea, retrolental fibroplasias, bronchopulmonary dysplasia, patent ductus arteriosus, fetal limb contracture formation, pulmonary hypoplasia and neonatal sepsis

depending upon gestational age and latency period. PLROM cause 20% of all neonatal deaths. Probable maternal complications are chorioamnionitis (3-30%), endometritis and placental abruption. Recurrence of PLROM may occur in 20% cause.

Maternal complications include intra-amniotic infection, which occurs in 13%–60% of women with PLROM, placental abruption, and postpartum endometritis.<sup>3,4</sup> Pre-term birth, infection, hypertensive disease, and asphyxia are cited as the most common contributors to maternal and fetal mortality in developing countries (LMICs).<sup>5,6</sup> Evidence suggests that the rupture of membrane is related to infection,<sup>7</sup> membrane dysfunction on a molecular level,<sup>8</sup> collagen destruction, and programmed cell death in fetal membranes.<sup>9,10</sup> The complication risk of PLROM is increased if the mother has previous PROM, low body mass index, concomitant infection of the gestational tissues, and longer the time elapsed between the rupture and delivery.<sup>11</sup>

Diagnosis and proper management is very important to limit various fetal and maternal complications generally due to infection. The maternal and fetal outcome in PLROM is very important to decrease maternal and child mortality and for better management and prevention of complications. Thus, this study aims to determine maternal and fetal outcomes in PLROM among pregnant women who were admitted to the maternity or labor ward in our rural tertiary care hospital.

Aim and objective of the study was to determine major maternal and neonatal outcomes in patients of PLROM.

**METHODS**

This prospective study was conducted in Department of obstetrics & Gynecology, in a tertiary care institute located in central India, over a period of 18 months, 210 pregnant women who reported to the labour room with premature rupture of membranes at or after 34 completed weeks to 41 weeks of gestation were analysed for maternal and perinatal outcome, after obtaining ethical clearance from the local ethical committee of the teaching hospital.

**RESULTS**

There was a total of 210 patients taken into the study. Following data was obtained.

The rate of maternal morbidity was 26% (54 out of 210), commonest was clinical chorio-amnionitis 1.9% (25 out of 210) followed by febrile morbidity seen in 10.5% (22 out of 210). Other maternal morbidities were in the form of wound infection-1.4% (3 out of 210), LRTI-0.5% of 210), MRP 0.5% (1 out of 210), puerperal sepsis 1.4% (3 out of 210). No maternal mortality was seen in the study.

**Table 1: Maternal outcome.**

Maternal Outcome	Total	Percentage (%)
Healthy	156	74.3
Febrile morbidity	22	10.5
Clinical CAM	25	11.9
Wound Infection	3	1.4
LRTI	1	0.5
UTI	1	0.5
PPH	2	1.0
MRP	1	0.5
Puerperal Sepsis	3	1.4
<b>Total</b>	<b>210</b>	<b>100.0</b>

**Table 2: Perinatal outcome.**

Perinatal Outcome	Total	Percentage (%)
Healthy	146	69.52
Birth Asphyxia	13	6.19
EONI	51	24.29
Late onset sepsis	2	0.95
Malformation	1	0.48
Hyperbilirubinemia	6	2.86
Congenital Pneumonia		0.48
Perinatal Mortality	3	1.43

**Table 3: Neonatal Parameters**

Neonatal Parameters	Total	Percentage (%)
Birth Weight (gms)	<1500	2 0.95
	1500-2000	13 6.19
	2000-2500	58 27.62
	>2500	137 65.24
Apgar Score	<7	13 6.19
	>7	197 93.81
Gender	Male	102 48.57
	Female	108 51.43
CRP	Positive	43 20.5
	Negative	167 79.5
Blood Culture	Positive	14 6.7
	Negative	196 93.3
WBC count	<15000	176 83.81
	>15000	34 16.19

Perinatal morbidity was seen in 30% of cases. Clinical early onset neonatal infection was the commonest cause for perinatal morbidity noticed in 23.8% cases. Other perinatal morbidities were birth asphyxia 6.19% (13 out of 21) (hyperbilirubinemia 2.86% (6 out of 210), congenital pneumonia 0.5% (1 out 210), congenital malformations 0.48% (1 out of 210), late onset sepsis

0.95% out of 210). Perinatal mortality observed was 1.43% (3 out of 210).

Out of 210 newborns of mothers who were having prelabour premature rupture of membranes at 34-41 weeks' gestation 65% had birth weight more than 2500 grams, 35% had low birth weight, 6.1 % had one minute Apgar score less than 7, 102 (48.5 %) were male and 108 (51.4%) were female, 43 (20.5 %) had C-Reactive protein positive, out of them 14 (6.7%) were having blood culture growth positive and 34 (16.1%) were having WBC count more than 15,000.

## DISCUSSION

PLROM is defined as spontaneous rupture of the membranes before the onset of labor; preterm prelabor Rupture of Membranes (PPLROM) includes those women presenting with PROM before 37 weeks' gestation. Mid-trimester PROM applies to those with premature membrane rupture at 14-26 weeks' gestation.<sup>12</sup>

ACOG (2007) have suggested that PPLROM complicates 2 to 4% of all singleton and 7 to 20% of twin pregnancies.<sup>13</sup> Getahun reported 5% incidence of PLROM.<sup>14</sup>

### *Maternal outcome and PLROM*

PLROM is associated with an increased risk of maternal morbidity. Maternal morbidity increased with increase in duration of PLROM. The rate of maternal morbidity was 26%, Clinical chorio-amnionitis was found in 11.9 % (25 out of 210) and next commonest was febrile morbidity seen in 10.5%, other maternal morbidities were wound infection (1.4%), LRTI (0.5%), UTI (0.5%), PPH (1%), MRP (0.5%), puerperal sepsis (1.4%). No maternal mortality was seen in the study. In Kodkany study maternal morbidity was seen in 21% of cases of PLROM.<sup>15</sup> Khashoggi (2004) Reported maternal morbidity including chorio-amnionitis (20.9%), postpartum endometritis (6.8%), abruption placenta (4%) and septicemia (0.5%).<sup>16</sup> In our study the rate of clinical CAM was found to be low compared to others as we have a protocol of starting antibiotics in cases of PLROM.

### *Perinatal outcome and PLROM*

The relationship of PLROM to the consequential fetal hazard is a matter of concern. In the present study, perinatal morbidity was seen in 30% of cases. Clinical early onset neonatal infection was the commonest cause for perinatal morbidity noticed in 23.8% (50 out of 210) of cases. Other perinatal morbidities were birth asphyxia (6.19%), hyper-bilirubinemia (2.86%), late onset sepsis (0.95%), congenital malformations (0.48%), congenital pneumonia (0.48%), and perinatal mortality was 1.43% (3 out of 210). Two of the three neonatal deaths were due to birth asphyxia and one was due to multiple congenital malformations. Akter reported perinatal mortality rate has

also been observed to be higher in association with PLROM.<sup>17</sup> In study by Sanyal perinatal morbidity was 32% and mortality was 5%.<sup>18</sup> Pulmonary hypoplasia occurs in patients with PLROM that lasted longer than 2 weeks. Hence, in our study there was no neonate with pulmonary hyperplasia. Khashoggi 2004 reported the prenatal survival rate was 94.5% whereas neonatal outcomes included neonatal mortality (5.5%), respiratory distress (15.9%), sepsis (7.7%), and necrotizing enterocolitis (1%).<sup>19</sup> Since we have included only the women with > 34 weeks' gestation and excluded the women with obstetric complications which could have given rise to compromised fetus, the perinatal mortality in our study was lesser than the other studies.

## CONCLUSION

PLROM is an enigmatic condition associated with high risk of maternal and perinatal morbidity and mortality. The overall incidence of PLROM is 6.02% of all deliveries during the study period. Major maternal morbidity is chorioamnionitis (11.9%). Major perinatal morbidity observed is early onset neonatal infection (24%). Prediction of these morbidities is an important step in the management of infection-associated with PLROM.

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