

IMPACT OF PREMATURE RUPTURE OF MEMBRANES ON MATERNAL & NEONATAL HEALTH IN CENTRAL INDIA

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ABSTRACT: OBJECTIVES: (1) To study incidence of PROM with respect to age, gravidity, gestational age and abnormal presentation. (2) To study impact of PROM on maternal health in terms of mode of delivery, maternal and fetal morbidity.

METHODS: 347 married women of age more than 18 years, who had premature rupture of membranes, delivered in G.M.H., Rewa (M.P.) over the period of 1year were included in the study and enquired about various demographic factors and its effect on pregnancy outcome and maternal health.

RESULTS: Incidence of PROM was 3.75%. majority of women came from rural area, majority were of age group 21-25 years, primigravidae, 66.6% women delivered within 24 hours of ruptured membranes, 47.4% of women delivered after 24 hours of have undergone caesarean section. Over all caesarean section rate among these patients was 33.4%. Abnormal presentation has a higher incidence of PROM. PROM had higher maternal morbidity-postoperative fever, wound sepsis, abdominal distension, chorioamnionitis and neonatal sepsis and still birth.

CONCLUSION: PROM has a great impact on maternal health and perinatal outcome, hence these patients should be managed aggressively. Women with adequate pelvis and favourable conditions for vaginal delivery should be augmented/induced and decision for caesarean section should be taken early to avoid complications.

KEYWORDS: PROM, Caesarean Section, Maternal Morbidity, Neonatal morbidity.

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INTRODUCTION: Pre-labour or premature rupture of membranes (PROM) is defined as rupture of membranes before the onset of labour irrespective of the gestational age.^[1] It could be term or preterm depending on the gestational age at which it occurred. Membrane rupture that occurs at or beyond 37 weeks of gestation is defined as term PROM whereas before completed 37 weeks of gestation it is known as preterm PROM (PPROM). PROM complicates approximately 5% to 10% of term pregnancies and up to 30% of preterm deliveries.^[2]

Approximately 60–70 % of term PROM cases are followed by the onset of labor within 24 h and an additional 20–30 % will start within 72 h.^[3,4] Diagnosis and proper management is very important as it is implicated for various fetal and maternal complications generally due to infection. Maternal and perinatal morbidity like puerperal infection, placental abruption, increased caesarean rates, umbilical cord prolapse, preterm birth, and fetal distress are significantly increased because of PROM. Evidence supports the idea that stimulation of labour, as opposed to expectant management, decreases the risk of chorioamnionitis without increasing the caesarean delivery rate.^[5]

MATERIAL & METHOD: Out of 9238 parturients, patients who had pre-labour rupture of membrane (PROM) and delivered between 1st January 2014 and 31st December 2014 in the Department of Obstetrics and Gynaecology, S.S.M.C. & G.M.H., Rewa (Madhya Pradesh) India were recovered from the medical records. The age, residence, socioeconomic status and parity of the mothers, the gestational age at the time of PROM, association with abnormal presentation, the duration of rupture of membrane, mode of delivery- vaginal or caesarean section, cause for caesarean section, maternal morbidity in terms of puerperal sepsis, fever, abdominal distension, wound sepsis, chorio-amnionitis, and perinatal morbidity in terms of prematurity, neonatal sepsis and IUD were observed. The total number of deliveries, total number of LSCS and perinatal deaths for the period was also determined. The information extracted was analyzed using SPSS version 15.0 for windows. The outcome of pregnancies were compared using the Chi square test. The p-value of less than 0.05 was taken as significant.

Inclusion Criteria: All patients with 1) Gestational age 28 weeks to 42 weeks, 2) Spontaneous leaking P/V since more than 1hour confirmed by history, examination and specific clinical tests, and 3) No evidence of uterine contractions.

Exclusion Criteria: Patients with 1) Gestational age less than 28 weeks or more than 42 weeks, 2) fever due to malaria, urinary tract infection or typhoid were excluded from the study, 3) patients not sure of dates.

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RESULTS:

- 1. Incidence:** In the Department of Obstetrics and Gynaecology, G.M.H., Rewa, during the period of one year from 1st January 2014 to 31 December 2014; there were total 9238 deliveries, 1323 LSCS and 347 cases of PROM; accounting for incidence of 3.75 %.
- 2.** Maximum incidence of PROM was found to be 74.3% is between age group of 21-30 years, being highest in 21-25 year group, about 52%. The incidence of PROM was more in primigravda(62.8%) than multigravida (37.2%) women. [Table 1].

Sl. No.	Particulars	Number	%
1	Age Wise Distribution (Years)		
	18-20	52	14.9
	21-25	181	52.1
	26-29	77	22.2
	>30	37	10.8
2	Residence Wise Distribution of Patients		
	Rural	255	73.5
	Urban	92	26.5
3	Relation of Gravidity With PROM		
	Primi	218	62.8
	Multi	129	37.2
4	Gestational Age In Relation To Prom		
	28-36.6	61	17.6
	>37	285	82.1

Table 1: Demography

Most of the cases (82.1%) belonged to gestational age more than 37 weeks (PROM) and only 17.9% were PPRM. [Fig. 1].

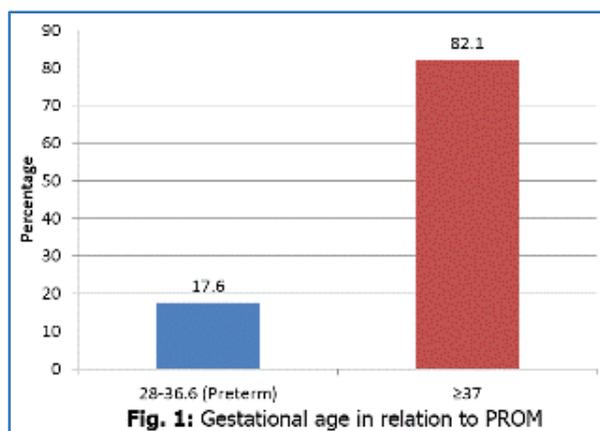


Fig. 1: Gestational age in relation to PROM

- 3.** All patients were managed aggressively; timely augmentation/induction of labour was done. In our study out of 347 patients 231(66.6%) were delivered within 24 hours while 116 women (33.4%) took more than 24 hours. Out of those delivered within 24 hours majority (68%) delivered vaginally and 32% cases delivered by LSCS. In contrast to this those who

delivered after 24hours to deliver, more than half (52%) patients had LSCS. [Table 2]. [Fig. 2].

Interval	No. of patient	Mode of delivery	Number	%
<24 hrs	231 (66.6%)	LSCS	74	32.0
		VD	157	68.0
≥24 hrs	116 (33.4%)	LSCS	55	47.4
		VD	61	52.6

$\chi^2=13.722$. $p=0.0002$ Significant

Table 2: Interval between rupture & membrane to delivery/LSCS

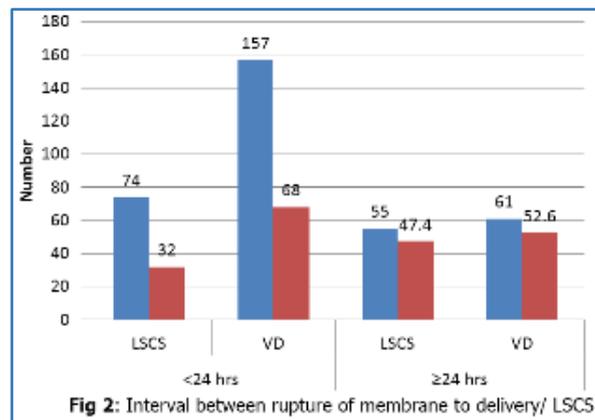


Fig 2: Interval between rupture of membrane to delivery/ LSCS

- 4.** Vaginal delivery was the commonest mode. Out of 347, 218 (62.8%) women delivered vaginally, rest of women had caesarean section (37.2%); which is 9.75% of all caesarean sections at our institution. (total LSCS in the same year were 1323). [Table 3].

Mode of delivery	No. of patient	Percentage
Vaginal Delivery	218	62.8%
LSCS	129	37.2%

$\chi^2=13.722$. $p=0.0002$ Significant

Table 3: Mode of delivery in relation PROM

- 5.** Most common indication for caesarean section was abnormal presentation (34.9%), other indications were non progress of labour (27.9%), fetal distress due to hyperstimulation or oligohydramnios (25.6%), cephalopelvic disproportion (11.6%). [Fig. 3]

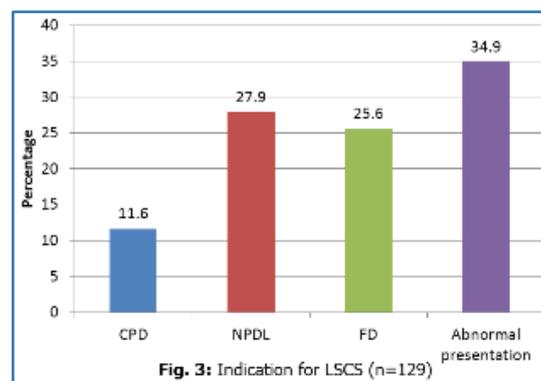
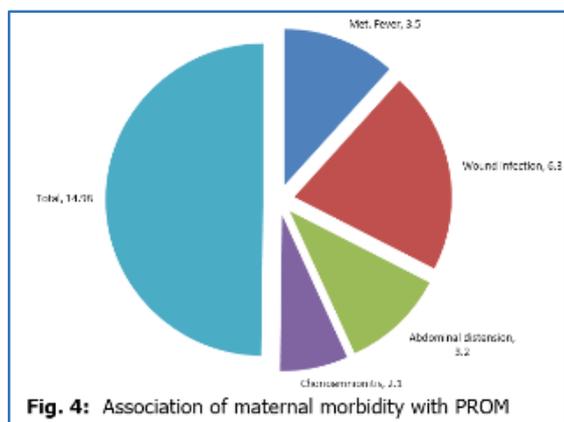


Fig. 3: Indication for LSCS (n=129)

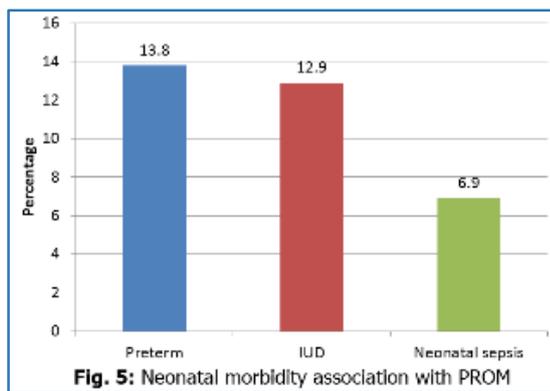
Out of 347 patients 69 (19.8%) had abnormal presentations like transverse lie, breech, oblique lie, footling etc.

6. Effects of PROM on the Mother and Infant:

A. Total 52 women out of 347 (14.98%) patients had some or other type of maternal morbidity; 6.3% patients had wound infection, around 3% patients developed fever and abdominal distension, whereas 2.1% patients had symptoms of chorioamnionitis. [Fig. 4].



B. In 32.9% of cases neonatal morbidity and mortality was associated. In our study, 13.8% women had PPROM that led to delivery of premature baby, 6.9% neonates had sepsis, whereas in 12.9% cases intrauterine death of fetus occurred due to complications like cord prolapse, oligohydramnios, fetal distress or other. [Fig. 5].



DISCUSSION: PROM complicates approximately 5% to 10% of term pregnancies.^[2] In our study, the incidence of premature rupture of membranes (PROM) was 3.75% of which 82.1% were term PROM and 17.6% were preterm PROM, similar to a study by M Gandhi et al in which 88.5% cases were associated with term PROM while incidence of PPROM was 11.5%.^[6]

In cases of PROM at term, labour typically ensues spontaneously or was induced within 12 to 24 hours^[3] as observed in our study, 66.6% of patients were delivered within 24 hours of membrane rupture which may be

because immediate intervention was instituted in these patients.

No age is immune to PROM. Majority of cases of PROM belonged to age group 21-29 years (74.3%) and about 52.1% from age group 21-25 years, similar results were found in study by M Gandhi et al. The apparent higher incidence of PROM in age group 21-25 years may be due to the fact that our patients complete their child bearing in 3rd decade.

Majority (73.5%) of women were from rural area that's why incidence is higher among rural population as seen by M Gandhi et al that 61.7% patients were from rural area and 38.3% were from urban area. In rural areas because of unhygienic conditions, there are more chances of infection, which is an independent risk factor for PROM.^[7,8,9,10]

Vaginal delivery was the commonest mode, out of 347 cases 66.8% cases delivered vaginally either spontaneously or by augmentation whereas 37.2% undergone LSCS. Similar to study by Shah et al who found that 77.5% of patients went in spontaneous labour after 24 h of expectancy.^[11]

The caesarean section rate at our institution is 14.3% of which 9.75% contribution is because of PROM and its associated complications. These observations are more than that seen by M Gandhi et al where normal vaginal delivery was the commonest mode of delivery 88% and caesarean section rate was 11.5%. In our study commonest indication for LSCS was malpresentation and nonprogress was seen in about 30% cases, similar to studies by M Gandhi et al who found common indications of LSCS to be fetal distress in 1st stage of labour (50.0%)^[12] and failure to progress in 31.8% cases.

Out of 347 cases, 69 cases (19.9%) were with abnormal presentation (e.g. transverse lie, breech, footling presentation, cord presentation cord prolapse) because abnormal presentation causes elevated pressure on Amniotic cavity, Twin pregnancy and polyhydramnios can also increase amniotic cavity pressure. When accompanying with fetal membrane defects, such as the loss of elasticity, collagen reduction, the increasing pressure acting on the weak fetal membrane place will cause premature rupture of membrane. The reason is that in the cephalopelvic disproportion or abnormal fetal position, fetal presentation can not engage in pelvic cavity properly, which will leave gaps between fetal presentation and pelvis. When the uterine pressure rises, increased intrauterine pressure is applied to the amniotic sac evenly through the gaps, which can lead to premature rupture of membrane, amniotic fluid decreases quickly and amniotic fluid cushioning effect reduces dramatically. As a consequence, umbilical cord will be squeezed by uterine wall and foetus, causing cord blood circulation disorder and fetal distress, increasing the chance of caesarean birth. Therefore, premature rupture of membranes often indicates dystocia.

In our study caesarean section rate was found to be higher in women who delivered after 24 hours of rupture of

membranes, it was 52% whereas in other group it was 32%. ($\chi^2=13.722$, $p=0.0002$).

Maternal morbidity was very high (14.9%), most common cause being wound infections 6.3%. similar to other studies, fever & abdominal distension contributed for 3.5 & 3.2%. Maternal morbidity was 3.12% in form of post partum fever and abdominal distension.^[6] All these patients were treated with broad spectrum antibiotics for 7 days. Maternal morbidity increased with increased PROM delivery interval. 2.1% women had chorioamnionitis.

In our study, preterm deliveries were 61 of which 18 developed complication. In 45 cases (2.9%) there occurred intrauterine death or still birth due to cord prolapse, hand prolapse or meconium stained liquor. Similarity is seen with other studies perinatal mortality was 2.86%.^[6] The puerperal infection is one of the main complications of PROM, the puerperal infection rate is 2.64%.

The reason is that PROM can cause pathogen retrograde, chorioamnionitis, endometritis, and operation incision infection etc. It can also cause fatal placental abruption, severe uterine empyema, pelvic inflammatory disease, such as peritonitis, sepsis, and septic shock and other serious complications, causing maternal severe infection, even death. PROM can normally cause premature birth, 30%-50% of which is associated with PROM.^[13] PROM can also result in the reduction of amniotic fluid volume which can cause intrauterine fetal distress, leading to perinatal infections, complications, fetal umbilical cord compression syndrome etc, which increase the morbidity of fetal distress, neonatal asphyxia and neonatal pneumonia increase significantly.^[14]

CONCLUSION: In conclusion, the incidence of PROM at term was high in our centre and a number of factors could contribute to this trend. While stimulation of labour was safe and effective, the pregnancy outcome did not significantly depend on the time and methods of stimulation of labour or route of delivery. The six weeks post-natal attendance was found to be poor. Further study may be necessary to substantiate these findings.

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