

## ORIGINAL RESEARCH

## Fetomaternal Outcome in Expectant versus Active Management in Preterm Prelabor Rupture of Membranes Close to Term Pregnancy

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### ABSTRACT

**Background:** PPRM is defined as preterm prelabor rupture of membranes which complicates the pregnancy and is associated with around 40% of all preterm births. It is associated with other maternal and neonatal complications like ascending infections leading to chorioamnionitis and other complications. Principal of management of a case of PPRM is still not clear that weather an active intervention should be done or it should be managed conservatively.

**Materials and Methods:** This retrospective study was done in Obstetrics and Gynecology department at TMMC and RC, Moradabad. Data of last five years, from (2018-2022) was collected and analysed.

**Results:** A total of 647 patients were admitted in last 5 years with PPRM out of which 375 patients were excluded as per our exclusion criteria, from remaining 272 patients 143 were managed conservatively and 129 were in active management group. There were more cases of clinical chorioamnionitis and neonatal infection in expectant group while the cases of respiratory distress syndrome and oxygen requirement at 24 hours were more in active management group. There were statistically significant difference in the duration of admission to delivery interval and need for neonatal antibiotic treatment in both groups and was more in expectant management group.

**Conclusion:** Active management of PPRM at 34 weeks had higher cases of neonatal morbidity while expectant management group had higher rate of chorioamnionitis, so in our opinion the active management should be delayed till 35 weeks of gestation.

**Keywords:** PPRM, Active Management, Expectant Management, Chorioamnionitis.

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## INTRODUCTION

Rupture of the membranes before the onset of labor is defined as Pre-labor rupture of membranes, and has a prevalence of 20% in all births and 40% in all preterm births.<sup>[1]</sup> In patients at term gestation, evidence suggest that immediate delivery has a lower chance of maternal infections as compared to the cases with expectant management.<sup>[2]</sup>

On international level, there is substantial variation in the practice if the women who presents at  $\geq 34$  weeks period of gestation i.e. near to term gestation.<sup>[3,4,5]</sup> International bodies like ACOG and RCOG recommends immediate planned delivery in women with ruptured membranes at 34 weeks and more period of gestation but these conclusions are despite the recognition that such recommendations are based on inconsistent and limited scientific evidences.<sup>[6,7]</sup>

Premature rupture of membranes before term is a state of more dilemma for the clinician as compared to the premature rupture of membranes at term , in case of extreme of preterm gestation, when the fetus has just crossed the period of viability and in absence of any established cause of fetal or maternal compromise, expectant management is desirable as prematurity is associated with higher neonatal complications such as neonatal mortality, intraventricular hemorrhage, respiratory distress syndrome.<sup>[8,9]</sup> With advancing gestation age, the risk of neonatal complications is reduced.<sup>[10]</sup> When the period of gestation approaches to term, fetus receives only few benefits by delaying the delivery as there are higher risk of ascending infections.

Nonetheless, whether to go for active management or expectant management in cases of preterm rupture of membranes from 34 to 36 weeks period of gestation is very controversial.<sup>[11]</sup>

In countries like USA, Canada and Australia there is a lack of consensus on the management of preterm prelabor rupture of membranes between (34-36) weeks of gestation.

This retrospective study compared the maternal complications like chorioamnionitis and neonatal morbidity including respiratory distress, neonatal infections and metabolic disorders in cases according to their management protocol of either active management or expectant management.

## MATERIALS & METHODS

This retrospective study was done at Teerthanker Mahaveer Medical College in the department of Obstetrics and Gynaecology. Data of the deliveries conducted in last five-year (2018-2022) was collected and then the number of cases which had preterm premature rupture of membranes (PPROM) between (34-36) weeks period of gestation i.e., close to term were noted according to the plan of management followed in a particular case, either active management or expectant management.

### Inclusion Criteria

Antenatal patients with preterm premature rupture of membranes at (34-36) weeks period of gestation with cephalic presentation.

### Exclusion Criteria

- If the patient was in labor at the time of admission
- If labor started within 12 hours of admission
- If fetal distress was present at the time of admission
- Patient with meconium-stained liquor
- Patient with multiple gestation

- Patient with features of chorioamnionitis at time of admission
- Patient with indication for caesarean section at the time of admission.

In both groups the level of C-reactive protein was tested and high vaginal swab was sent to see any microbial growth.

In the presence of reassuring fetal heart rate and absence of maternal infection, patient was hospitalized for expectant management and daily monitoring of maternal vitals and fetal rate was done. CRP level and High vaginal swab was tested on the admission day and then was repeated after every 72 hours until delivery. In this group planning for delivery was done if there was spontaneous onset of labor, the fetal heart rate was not reassuring, vaginal swab tested positive for group B streptococcus, CRP level  $\geq 10\text{mg/l}$  or the clinical symptoms of chorioamnionitis were there.

Patients in the active management group were supposed for the induction of labor within 24 hours of admission and induction was done either by misoprostol or by controlled oxytocin administration.

Corticosteroids were given for the fetal lung maturation.

In either of the groups, tocolysis was not used at or after 34 weeks of gestation.

Cesarean sections were performed in case of non-reassuring fetal heart rate during hospital stay or during labor, arrest of labor or due to other standard obstetrical indications. Neonatal outcomes were noted.

The newborn of the mother who had history of fever or clinical symptoms suggestive of infection were admitted in neonatal intensive care unit for evaluation of the neonatal sepsis and babies who had signs of sepsis were given until the reports of culture were awaited and antibiotic therapy was continued in case of confirmed neonatal infection.

Neonatal outcomes included respiratory distress syndrome, requirement of oxygen at 24 hours of neonatal life, neonatal infection and sepsis, need for antibiotic therapy for first 72 hours, hypocalcemia, hypoglycemia, hyperbilirubinemia and other complications like feeding problems.

## RESULTS

The result of the study was analysed using SPSS 24, Chi-square test was used for the comparison of categorical variables and for continuous variables t test was used. Logistic regression was applied for determination of the fact that whether the requirement of oxygen for neonate at 24 hours was associated with any of the prenatal management policies after adjusting for the gestational age either at the time of admission or at the delivery.

In a duration of 5 years, a total of 647 antenatal patients were admitted with PPRM at (34-36) weeks period of gestation, from which 375 patients were excluded from the study because from these 375 patients, 258 were in labor either at time of admission or within 12 hours of admission, 66 had breech presentation, 42 had medical or obstetrical contraindication for vaginal delivery and for 10 patients' clear data was not available.

Finally, a total of 272 patients with PPRM at (34-36) weeks period of gestation i.e., close to term was included in the study, of which 129 were in active management group and 143 were in expectant management (EM) group.

Of these 272 patients, 65 patients were at 34 weeks of gestation, 99 patients were at 35 weeks of gestation and 108 were at 36 weeks of gestation at the time of admission.

Table 1 is showing the maternal characteristics among the study subject. Average maternal age was higher in the active management group than the expectant management group but it was comparable in both groups while the number of Nulliparous patients was more in the

expectant management group than the active management group. In expectant management group, the number of patients with bishop score < 6 were more as compared to the active management group but statistically it was comparable in both groups. The mean gestational age at the time of admission was higher in the active management group as compared to the expectant management group while the gestational age at delivery was higher in the expectant management group as compared to the active management group.

**Table 1: Maternal Characteristics**

Characteristics	Expectant Management (n=143)	Active Management (n=129)	P value
Maternal age (in years) (mean $\pm$ SD)	30.2 $\pm$ 5	31.8 $\pm$ 4.8	> 0.05
Nulliparous	74 (51.7%)	63 (48.83%)	>0.05
Previous cesarean section	28 (19.58%)	22 (17.05%)	>0.05
Bishop score < 6 at admission	75 (52.44%)	60 (46.51%)	>0.05
Mean gestational age at admission (weeks + days)	(35 + 2)	(35 + 4)	>0.05
Mean gestational age at birth (weeks + days)	(36 + 3)	(36 + 1)	>0.05

Table 2 is showing the obstetrical outcomes

The mean time duration between admission and delivery was more in the expectant management group as compared to the active management group which was statistically significant with p value < 0.05.

In the expectant management group, there were more cases of chorioamnionitis (8 patients) as compared to the active management group (4 patients), although it was not statistically significant. Advancing gestational age from the time of admission to delivery was associated with higher incidence of developing chorioamnionitis.

In both active management group and expectant management group, a greater number of patients had spontaneous onset of labor. In expectant management group 88 patients had spontaneous onset of labor while 12 patients in the active management had spontaneous onset of labor, the difference among the two groups was statistically significant.

Out of 143 patients, 102 patients (71.33%) delivered vaginally in expectant management group while 90 patients (69.77%) delivered vaginally in the active management group (p value > 0.05) which was comparable in both groups.

**Table 2: Obstetrical outcomes**

Characteristics	Expectant Management (n=143)	Active Management (n=129)	P value
Mean duration between admission to delivery	48.54	24.36	<0.05

Clinical chorioamnionitis	8 (5.5%)	4 (3.1%)	>0.05
Onset of labor			
Spontaneous	88 (61.5%)	12 (9.3%)	<0.05
Induced	55 (38.5%)	117 (90.69%)	
Mode of delivery			
Vaginal	102 (71.33%)	90 (69.77%)	>0.05
Cesarean section	41 (28.67%)	39 (30.23%)	

Table 3 is showing the neonatal outcomes

Neonates born in the expectant management group had more requirement for antibiotic treatment as compared to neonates born in active management group, which was statistically significant (p value <0.05). The number of neonates requiring oxygen support even at 24 hours were higher in the active management group as compared to the expectant management group but statistically it was comparable in both groups. Number of new born who had respiratory distress at birth was lesser in the expectant management group, out of 8 newborns who had respiratory distress, 4 were from 34 weeks period of gestation and 2 each from 35 weeks and 36 weeks period of gestation group. None of the baby in either group had intraventricular haemorrhage, bronchopulmonary dysplasia and patent ductus arteriosus.

**Table 3: Neonatal outcomes**

Outcome	Expectant management (n=143)	Active management (n=129)	P value
Birth weight (in grams) (mean $\pm$ SD)	2628 $\pm$ 389	2601 $\pm$ 345	>0.05
Apgar score < 7 at 5 minutes	5 (3.35%)	2 (1.55%)	>0.05
Number of NICU admission	10 (6.99%)	14 (10.85%)	>0.05
Respiratory distress	8 (5.59%)	10 (7.75%)	>0.05
Oxygen requirement at 24 hours	5 (3.49%)	8 (6.2%)	>0.05
Neonatal infection	12 (8.06%)	7 (5.42%)	>0.05
Antibiotic requirement for 1 <sup>st</sup> 72 hours of life	10 (6.75%)	2 (1.55%)	<0.05
Hyperbilirubinemia	44 (29.5%)	47 (36.43%)	>0.05
Feeding problems	18 (12.08%)	17 (13.17%)	>0.05
Total hospital stay (days)(mean $\pm$ SD)	5.9 $\pm$ 5.2	6.5 $\pm$ 6.1	>0.05

## DISCUSSION

In this research article, we found that active management group had higher incidence of neonatal morbidity and the expectant management group had higher rate of clinical chorioamnionitis. Oxygen requirement was higher in active management group then expectant management group but it can be attributed to their lower gestational age at delivery because this finding was not significant after adjustment for the gestational age. It is well known that the requirement for oxygen support decreases as the gestational age increases.

Similar results were reported in the study by Escobar GJ et al. <sup>[12]</sup> in which higher rate of oxygen requirement was in active management group than expectant group. In study by BM mercer et al. <sup>[13]</sup> and SM Cox et al. <sup>[14]</sup> they included evidence of fetal lung maturation as an inclusion criterion. As respiratory distress developed in near term infants has less chance of long-term complications, clinician tend to considered as a self-limiting condition requiring less intervention but in some cases, it requires long term hospitalization with increased risk of chronic lung disease and poor outcome. <sup>[15,16]</sup> In our study number of neonates who developed hyperbilirubinemia were more in active management group similar to the findings of the study by Limen et al. <sup>[17]</sup>

In our study the number of cases of clinical chorioamnionitis were more in the expectant management group i.e., 5.5% as compared to the 3.1% in active management group. These findings were consistent with the trial by Naef et al. <sup>[18]</sup> who did a prospective trial on 120 females with PPRM who were randomly assigned for either the induction group or the observation group, 16% patients of the observation group had chorioamnionitis versus 2% in induction group which in turn increased their hospital stay also. Since clinical chorioamnionitis is considered as a risk factor leading to cerebral palsy in near term and term deliveries but in our study all neonates had good short term neurological outcomes. In a case control study by Wu et al. <sup>[24]</sup> clinical chorioamnionitis was associated with cerebral palsy (OR 4.1, 95% CI).

In our study the neonates in the active management group had lower rate of antibiotic treatment but their hospital stay was more in comparison to the expectant management group. This difference can be due to the judgement of the treating neonatologist, frequent use of antibiotics in the expectant management group can be because neonatologist may be more cautious in infants who had longer time interval from PPRM to delivery. In the study by Escobar GJ et al. <sup>[12]</sup> similar results were there showing more antibiotic requirement in the expectant management group.

## CONCLUSION

In comparison to the term neonates, PPRM at (34-36) weeks gestation has higher chances of neonatal morbidity and mortality but the choice between active management and expectant management remains controversial because no study provides the clear-cut answer. As in our study the rate of respiratory complications were more observed at 34 weeks of gestation, and advancing gestational age after PPRM was associated with higher chance of chorioamnionitis so in our opinion the active management should be delayed till 35 weeks of gestation.

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