

**Original Article**

## A Comparative Study of Immediate Induction and Twelve Hour Expectant Management of Labour in Term Premature Rupture of Membranes

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**Abstract**

**Context:** PROM –immediate induction and expectant management.

**Aims:** 1. To compare the management of women with term premature rupture of membranes in the immediate induction group and twelve hour expectant management group.

2. To study the maternal and neonatal outcomes in these groups

**Settings and Design:** This was a prospective study conducted in the obstetrics and gynecology department, Government Medical college hospital, Trivandrum.

**Material and Methods:** This is a prospective study of 100 cases of singleton pregnancies with term PROM where 50 cases were allotted at random to group A [ immediate induction of labour after PROM] and 50 cases were allotted to group B [expectant management for 12 hours].

**Statistical Analysis:** The tests used were chi-square test, student's t test, test of proportions and Fischer's exact test.

**Results:** There was no statistically significant difference in the PROM delivery interval in both groups. Maternal morbidity and fetal morbidity were similar in both groups. The differences in caesarean section rates between the two groups were found to be not statistically significant. In delayed induction groups 41 % of primigravidas and 50% of multigravidas went in to spontaneous labour within 12 hours. Of these, 8 (23.5%) primis and 2 (12. 5 %) multi gravidas required augmentation with oxytocin. While 17.6 %of primi gravidas and 37.5 % of multi gravidas delivered without the need of oxytocin.

**Conclusion:** In term pregnancies with PROM, it is not necessary to hasten the induction of labour. A delay of 12 hours will allow many women to go in to labour spontaneously and reduce the need for induction with no increase in caesarean section rate and maternal and neonatal morbidity.

**Keywords:** PROM, Expectant management, maternal outcome.

**Key message:** In term of labour pregnancies with PROM, it is not necessary to hasten the induction.

**Introduction**

Prelabour rupture of membranes is a spontaneous breach of the chorioamnion with release of amniotic fluid, with a latent period before the

onset of labour. The membranes may rupture at term i.e.: after 37 completed gestational weeks, when it is called term Prelabour rupture of membranes. If the membranes rupture before this

period, it is called preterm Prelabour rupture of membranes.

Prelabour rupture of fetal membranes is one of the most common and controversial problem faced by the obstetric clinician. Prelabour rupture of membranes is significant for three reasons. First if the presenting part is not fixed in the pelvis, the possibility of prolapse of the umbilical cord and cord compression are greatly increased. Second, labour is likely to occur soon if the pregnancy is at or near term. Third, if delivery is delayed for 24 hours or more after membrane rupture there is increasing likelihood of serious intrauterine infection.

The average incidence is 10 % but varies from 2-18 %. This wide range is due to the number of variables like the definition of latent period and the methods used for the diagnosis of PROM. Approximately, 60-80% of cases of PROM occur in term pregnancies.<sup>(1)</sup> Among the 10% of cases of PROM occurring in pregnancy, if labour is not induced, over 60% of these women begin labour spontaneously within 24 hours and over 95 % begin labour within 72 hours<sup>(2-4)</sup>. Approximately 3-4 % did not begin labour in 7 days.<sup>(2)</sup> The problems for the mother and the fetus seen in cases of term pregnancies are for those patients with an unfavorable cervix i.e.: with a bishop's score of less than 6. The maternal problems met with in these patients are a higher incidence of dysfunctional labour, chorioamnionitis, and increased rates of caesarean section, postpartum hemorrhage and endometritis while the problems for the newborn are those of infection.

As the latent period extends the chance of ante partum and puerperal febrile morbidity increases. But early intervention seems to trade these risks for increase in caesarean section rates either due to failed induction or due to fetal distress. Hence the management of PROM puts the obstetrician with a dilemma.

This study was conducted to compare the maternal and neonatal outcomes in women with PROM at term in the immediate and delayed induction groups.

### Materials and Methods

This is a prospective study of 100 cases of singleton pregnancies with term PROM where 50 cases were allotted at random to group A [immediate induction of labour after PROM i.e. : within 4 hours of PROM] and 50 cases were allotted to group B [expectant management for 12 hours].

#### Inclusion criteria

Patients with

Term premature rupture of membranes

Fetus in cephalic presentation

Normal cardiotocogram

Presented to labour room within 12 hours of premature rupture of membranes

All primigravida and multigravida

No contraction at admission

#### Exclusion criteria

Infection

Malpresentation

Multiple pregnancy

Previous caesarean section

Meconium stained liquor

Non reactive NST

Ante partum hemorrhage

Maternal fever

Gestational age less than 37 weeks

CPD

PROM more than 12 hours

After leaking was confirmed, patients were randomly allotted to 2 groups- group A (immediate induction group) and group B (expectant management group). Bishop's score was assessed by per vaginal examination at the time of admission under strict aseptic precautions. A bishop's score of less than 6 was considered as unfavorable cervix.

1st group- group A – immediate induction (induced within 4 hours of PROM)

2nd group – Group B- late induction (expectant management of 12 hours)

For women in the immediate induction group, labor was immediately induced by instillation of

PGE2 gel intracervically if bishop's score was less than or equal to 6 and with oxytocin if bishop's score was more than 6. Intermittent auscultation was used for routine fetal monitoring. Decision regarding the mode of delivery was taken by the consultants according to general policies of labour.

Patients in expectant management group were observed for 12 hours. All patients who did not go in to spontaneous labour after 12 hours were assessed and PGE2 or oxytocin was given according to the bishops score.(If less than or equal to 6 - PGE2 and >6 - oxytocin).

Infants were managed as per following protocol

Babies were evaluated using Bhakoos score:

Low birth weight < 2 kg - 3

PROM >18 hours -1

Maternal pyrexia -2

Foul smelling liquor /chorioamnionitis -2

Birth asphyxia -2

No of P/V > 5 -2

If the score is:

0-3 - observe

4-6 - investigate

>6 - treatment with antibiotics

Investigated using following tests

CRP

Absolute neutrophil count

Micro ESR

Peripheral smear—look for band forms

Blood culture and sensitivity

If found to be positive, considered as neonatal sepsis and treatment given with antibiotics. Babies were admitted only when there was worsening of symptoms in spite of antibiotics.

### Outcome measures

Interval between rupture of membranes and delivery, number of LSCS, number of patients who went in to spontaneous labour, neonatal sepsis and maternal morbidity were evaluated.

### Statistical analysis

The data collected in the structured Performa was entered into master sheet and statistical tables were constructed. The statistical constants like mean, standard deviation, percentage etc were computed to compare the different groups .The tests used were chi-square test, students t test, test of proportions and Fischer's exact test.

For the computation of various statistical constants, computer packages were used.

### Results

Expectant and immediate induction groups were similar with respect to age, parity and gestational age.

The mean of PROM delivery interval was calculated separately for primigravidas and multigravidas. As shown in table 1, the mean of prom –delivery interval in primis in immediate induction group is 15.7 hours and late induction group is 16.4 hours. As shown in table 2, the mean of prom –delivery interval in multigravidas in immediate induction group was 12.2 hrs and late induction was 14.8 hours. The differences when tested statistically were not found to be significant. Hence it was inferred that there was no statistically significant difference in the PROM- delivery interval in the immediate and delayed induction groups in both primi and multigravidas.

**Table 1**{PROM delivery interval in primis }

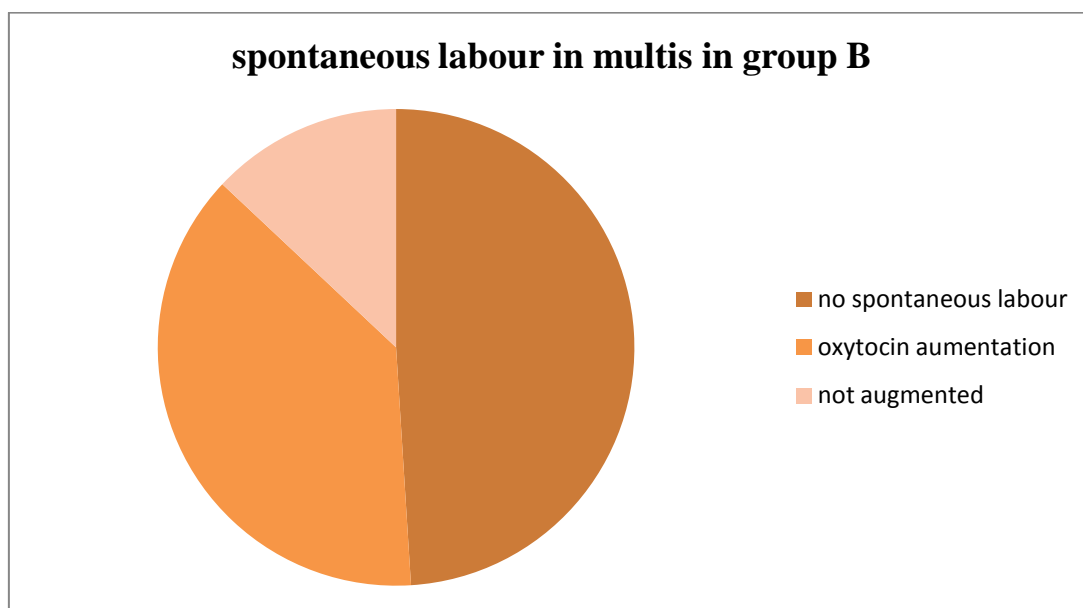
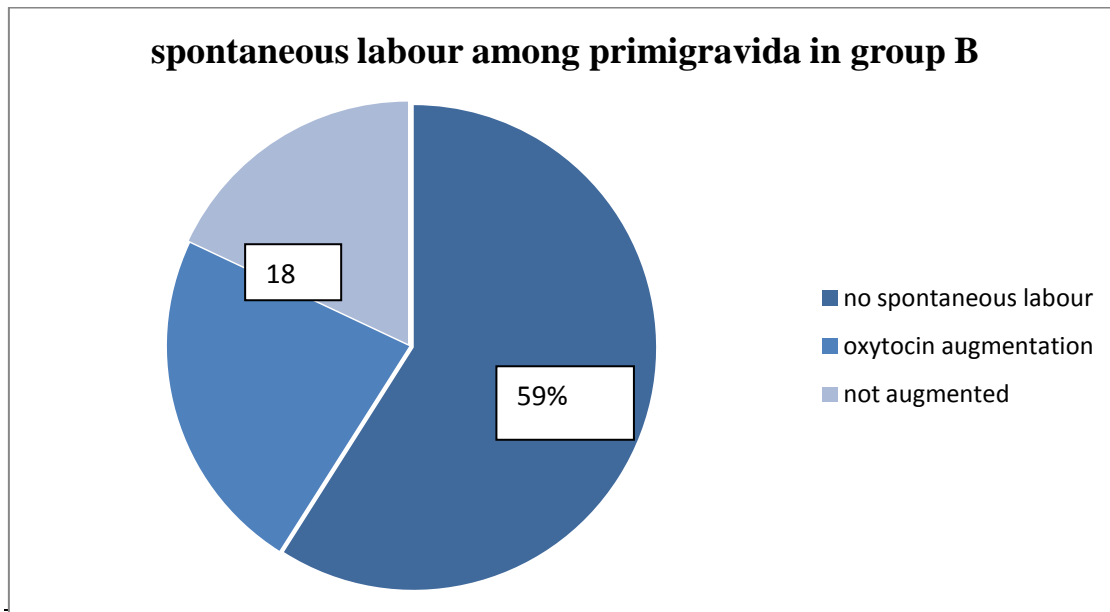
Groups	n	mean	S.D	t value	P value
A	37	15.7 hrs	5.6	0.42	P > 0.05
B	34	16.4 hrs	7.9		

**Table 2** {PROM –delivery interval in mults }

Groups	n	Mean	S.D	T value	P value
A	13	12.2	4.3	1.13	P > 0.05
B	16	14.8	7.2		

41 % of the primigravidas {14} and 50 % {8} of the multigravidas went in to spontaneous labour in the expectant management group. Of these 8(23.55) primis and 2 (12.5 %) of multis required

augmentation with oxytocin. In all, 17.6 % primis and 37.5 % of multigravidas delivered without the need of oxytocin.



The difference in bishop’s scores in primis in both groups and multis in both groups were not found to be statistically significant. Hence the results were not affected by the bishop’s score.

**Mode of delivery**

The caesarean rate in primis in immediate induction group was 16.2 % and delayed induction group was 11.8 %. The caesarean

section rates were tested statistically and the difference was found to be insignificant. The caesarean section rates were hence found to be comparable in both groups as shown in table 3.

Out of the 6 cases of Group A which ended in caesarean section, 3 cases were due to failed induction, 2 due to fetal distress and one due to protracted active phase, maternal fever. In group B, all the 4 cases were done for fetal distress.

**Table 3 - Mode of delivery in primigravida**

Groups	Mode of delivery				Total
	Abdominal		Vaginal		
	Number	%	Number	%	
A	6	16.2 %	31	83.8%	37
B	4	11.2 %	30	88.2%	34

X<sup>2</sup> = 0.04      df = 1      P > 0.05

As in table 4, the c section rates in multigravida were not found to be statistically significant. The indication

for caesarean section in group A was failed induction.

**Table 4 - Mode of delivery in multigravida**

Groups	Mode of delivery				Total
	Abdominal		Vaginal		
	Number	%	Number	%	
A	1	7.7 %	12	92.3 %	13
B	0	0	16	100 %	16

The incidence of maternal fever was 6% in the immediate induction group and 4% in the delayed induction group which was not statistically

significant. Hence the maternal morbidity was same in both groups. There were no cases of wound infection or endometritis in either group.

**Table 5 - Maternal morbidity**

Groups	Maternal fever				Total
	present		absent		
	Number	%	Number	%	
A	3	6 %	47	94 %	50
B	2	4 %	48	96 %	50

X<sup>2</sup> = 0.21      df = 1      P > 0.05

**Table 6 - Neonatal sepsis evaluation**

Groups	Sepsis evaluation				Total
	present		absent		
	Number	%	Number	%	
A	5	10 %	45	90 %	50
B	2	4 %	48	96 %	50

X<sup>2</sup> = 0.61      df = 1      P > 0.05

10 % of the babies in the immediate induction were admitted to inborn nursery for evaluation, while 4 % of the babies in the delayed induction

group were admitted. This difference was tested statistically and was found not to be significant. Hence it was inferred that the neonatal morbidity were same in both the groups.

**Table 7- Babies RDT + ve**

Groups	RDT + ve				Total
	Present		Absent		
	Number	%	Number	%	
A	6	12 %	44	88 %	50
B	2	4%	48	96 %	50

X<sup>2</sup> = 1.2      df = 1      P > 0.05

12 % of the babies in the immediate induction group were RDT + ve and 4 % of the babies in the delayed induction group were RDT +ve. This

difference was not found to be statistically significant ensuring that neonatal morbidity was same in both groups.

**Table 8** Babies with apgar < 6 at 1 minute

Groups	< or equal at 1 minute to 6		>6 at 1 minute		Total
	Number	%	Number	%	
A	2	4 %	48	96%	50
B	1	2%	49	98%	50

$\chi^2 = 0.34$        $df = 1$        $P .0.05$

4 % of babies in group A and 2 % of the babies in group B had apgar < 6 at 1 minute at the time of delivery. This is not statistically significant.

### Discussion

The management has remained controversial when PROM occurs in low risk term patients with vertex presentation. Although many studies are available in the literature; there is no definite protocol for management. The concerns with conservative management are infectious risks to the mother and fetus where as immediate induction can increase the caesarean section rates. The women in the study were from a homogeneous population and were comparable with respect to mean maternal age, parity, gestational age and socioeconomic status. In the present study, the maternal age in primigravidas was 22.3+<sub>-</sub>2.9 and 25.3 +<sub>-</sub> 3.3 in multigravidas respectively.

Hannah et al, in their randomized control trial had concluded that immediate induction and conservative management result in similar rates of caesarean section and neonatal infection, immediate induction with oxytocin resulted in lower risk of maternal infection than with expectant management. In their study, they observed patients for 4 days on conservative management<sup>(6)</sup>. In this study, where the expectant management was only 12 hours, the maternal and neonatal morbidity were not affected. Peglec et al reported from their multicentric trial, prolonged PROM, especially more than 12 hours is a predictor of caesarean section<sup>(7)</sup>. Histologically proven chorioamnionitis significantly correlated with interval between rupture of membranes and termination of pregnancy. Hence 12 hour period was chosen after considering the increased morbidity with increasing PROM delivery interval

and at the same time allowing a good number of women to go in to spontaneous labour.

Hjertburg et al reported similar caesarean section rates, when expectant management of PROM was 12 or 24 hours<sup>(8)</sup>. Shalev et al found 12 hours and 72 hours expectant management of PROM comparable regarding infectious complications and pregnancy outcome although the longer wait prolonged the interval to delivery and increased hospitalization costs<sup>(9)</sup>.

In this study, there was no statistical difference between PROM delivery interval of the immediate induction and delayed induction group. Hence it was inferred that immediate induction did not have much advantage in shortening the PROM delivery interval and also in reducing the cost of hospital stay. In a study conducted at Vellore, India there was statistically significant increase in the PROM delivery in the delayed induction group.

11 % of the primigravida and 50 % of the multigravida went in to spontaneous labour within 12 hours in the delayed induction group, of these 8 primis and 2 multis required augmentation with oxytocin; While 17.6 % of the primis and 37.5 % of the multis delivered without the need for oxytocin. This is in controversy to Grant et al where an optimum period more than 12 hours favors efficient labour and spontaneous vaginal delivery.

In a study conducted at Vellore by Dr George Susan shanty et al, 55% of multis and 35.6 % of primis went into spontaneous labour in 12 hours with 4 multi and 9 primis requiring augmentation with oxytocin. In all, 46.7 % of the multis and 20 % of the primis delivered without the need for oxytocin infusion<sup>(5)</sup>. This was comparable to the results of our study. It is also similar to the observation of Sperling et al where 40 % went in

to spontaneous labour within 12 hours thus the use of oxytocin can be avoided in a good number of patients by delaying induction of labour without compromising maternal and neonatal condition<sup>(10)</sup>.

Per vaginal examination was done for both the groups at the time of admission. Repeated examination was done in those women who went in to spontaneous labour or after 12 hours in those who did not go in for spontaneous labour in the expectant group. This is probably the major contributing factor in the prevention of puerperal sepsis and neonatal infection.

Seaward et al had identified an increased number of vaginal examinations as the predictor of neonatal infection<sup>(11)</sup>. Hallak and Bottoms suggested immediate induction for PROM at term especially if digital examination has been performed based on worse perinatal and maternal outcome with delayed labour induction when vaginal examination was part of initial evaluation of patients with PROM<sup>(12)</sup>.

There were no statistical differences in the incidence of neonatal sepsis evaluation, apgar scores, babies who were RDT + ve between the 2 groups. In a similar study conducted in Vellore, India<sup>(5)</sup> there was no statistical difference in the immediate and delayed induction group which is comparable to our study.

Thus in term pregnancies with PROM, it is not necessary to hasten induction of labour. A delay of 12 hours will allow many women to go in to labour spontaneously and reduce the need for oxytocin infusion with no increase in caesarean section rates and maternal and neonatal morbidity.

### Conclusions

Variables like age, gravidity, gestational age, and Bishops score were comparable in the two groups and hence that was not affected the outcome of the study.

Prom –delivery intervals were compared separately in Primis and multigravidas. It was found they there was no statistically significant difference in the PROM – delivery interval in both

the groups. Hence it has been concluded there was no statistically significant difference in the PROM delivery interval in both groups. Hence it was concluded that there was no specific advantage in inducing the patients immediately when compared to expectant management of 12 hours.

Maternal morbidity and fetal morbidity were similar in both groups. The differences in caesarean section rates between the two groups were found to be not statistically significant.

In delayed induction groups 41 % of primigravidas and 50% of multigravidas went in to spontaneous labour within 12 hours. Of these ,8( 23.5%) primis and 2 (12. 5 %) multi gravidas required augmentation with oxytocin .While 17.6 %Of primi gravidas and 37.5 % of multi gravidas delivered without the need of oxytocin.

Thus in term pregnancies with PROM, it is not necessary to hasten the induction of labour. A delay of 12 hours will allow many women to go in to labour spontaneously and reduce the need for induction with no increase in caesarean section rate and maternal and neonatal morbidity.

**Conflicting interest-** nil

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