

## Early Termination of Pregnancy Versus Expectant Management in Preterm Prelabor Rupture of Membranes Between 32 and 34 Gestational Weeks

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### Abstract

The aim of this work was to compare between expectant management and early termination of pregnancy in pregnant women with premature prelabor rupture of membranes (between 32 and 34 weeks) on maternal and fetal outcomes. This study included 140 cases attending Already Hospital and divided into two groups:

**Group I (expectant group):** 70 cases were managed conservatively.

**Group II (induction group):** 70 cases for labour induction (by misoprostol or oxytocin) or by CS.

All patients were submitted to the following:

I- Informed written consent was taken from the pregnant women.

II- Full history taking

III- Clinical examination

IV- Laboratory investigations:

V- Ultrasound to clarify

VI- Ruptured membrane was defined in the trial by clinical assessment with a sterile speculum examination and visualizing amniotic fluid passing through the cervix os and pooling in the posterior fornix of the vagina. No digital examination done in absence of labour.

VII- Patients were given information about the expectant management and its value and complications possible to occur and information about induction of delivery and its value and complications. Both groups were treated with antibiotics and corticosteroids.

The results of the present study revealed:

(1) No significant difference between both groups in neonatal morbidity:

a) In induction group, there was an increase in neonatal RDS.

b) In expectant group, there was an increase in neonatal sepsis.

(2) High significant difference between both groups regarding maternal morbidity where in expectant

management, an increase in chorioamnionitis and postpartum endometritis was found.

(3) Significant difference between both groups regarding mode of delivery, where CS and instrumental delivery were increased in the induction group.

### Conclusion

Expectant management increases the probability of infectious disease for both mother (chorioamnionitis and endometritis) and neonate (neonatal sepsis). Induction of labour leads to preterm birth with increase in neonatal morbidity (RDS).

- The worst prognosis of neonatal morbidity is due to prematurity.
- Expectant management is more accepted from patients and it is associated with less complications than early termination of pregnancy but when:
  - a) Proper use of medications (antibiotics, corticosteroids and short-term tocolytics).
  - b) Close observation for both maternal and fetal wellbeing.

### Introduction

Premature Rupture of Fetal Membranes (PROM) refers to fetal membrane rupture before the onset of uterine contractions; Preterm PROM (PPROM) is the term used when the pregnancy is less than 37 complete weeks of gestation (1).

PROM occurs in 10% of all gestation and about 2-4% of preterm pregnancies, with complications such as infection and preterm birth (2). Correct diagnosis of PROM has a great importance because failure of diagnosis can lead to unwanted obstetric complications as chorioamnionitis, cord prolapse and placental abruption (3). Approximately one-third of women with PPRM develop potentially serious infections, such as intra-amniotic infection

(chorioamnionitis and funisitis), endometritis, or septicemia (1).

Serious complications of PROM that have been reported with conservative management of PROM occurring early in pregnancy are retained placenta or postpartum haemorrhage (2).

The fetus and neonate are at greater risk of PPRM-related morbidity and mortality than the mother. Preterm infants are especially vulnerable to a variety of problems, such as respiratory distress syndrome, intraventricular hemorrhage, periventricular leukomalacia, infection (e.g. sepsis, pneumonia, meningitis), and necrotizing enterocolitis. The rates of these morbidities vary with gestational age and are higher in the setting of chorioamnionitis (4).

The risk to the fetus is greatly increased if PPRM occurs before the limit of viability. With prolonged oligohydramnios, there is significant risk for maldevelopment of the alveolar tree (pulmonary hypoplasia) as well as fetal compression resulting in malformations similar to those in Potter syndrome (5).

The false diagnosis of membranes rupture can lead to inappropriate intervention such as hospitalization or induction of labor. Therefore, it is highly desirable to establish a definite diagnosis of rupture of membranes in uncertain cases without delay (6).

In a randomized controlled trial, David et al. (2012) investigated induction of labor versus expectant management for women with preterm prelabor rupture of membranes and their primary outcome was the rate of neonatal sepsis (the proportion of babies that develop neonatal sepsis) and secondary outcomes were the rates of neonatal respiratory distress syndrome (RDS), cesarean section (surgical delivery), and chorioamnionitis in women with PPRM between 34 and 37 weeks' gestation (7,8).

The American Congress of Obstetricians and Gynecologists guidelines recommend Induction of Labor (IOL) if PPRM occurs at or beyond 34 weeks of gestation (9).

The Royal College of Obstetricians and Gynaecologists guidelines state that delivery should be considered at 34 weeks of gestation and recommend that women with PPRM who are managed expectantly beyond 34 weeks of gestation be counseled about the increased risk of chorioamnionitis and the presumed decreased risk of neonatal respiratory problems, admission for neonatal intensive care, and cesarean section (10).

In a Cochrane review on the management of PPRM prior to 37 weeks, Buchanan et al. (2010) concluded that there is insufficient evidence to guide clinical practice in the management of PPRM (11).

Preterm Prelabour Rupture of the Membranes (PPROM) is an important clinical problem and a dilemma for the gynaecologist. On the one hand, awaiting spontaneous labour may lead to an increase in infectious disease for both mother and child, whereas on the other hand, induction of

labour leads to preterm birth with an increase in neonatal morbidity [e.g. Respiratory Distress Syndrome (RDS) and a possible rise in the number of instrumental deliveries] (12).

Although it is generally accepted that the fetus benefits from expectant management in pregnancies complicated by PROM before 32 weeks' gestation, the management of PROM that arises between 32 and 34 weeks remains controversial and a focus of ongoing research. Because most neonatal morbidity is caused by prematurity, and the rate of prematurity-related complications decreased with increasing gestational age, some argue that the potential benefit of prolonging latency after 32 weeks' gestation does not outweigh the risk of chorioamnionitis (13).

Expectant management after 32 weeks leads only to an increased rate of chorioamnionitis and longer maternal and neonatal hospitalization, without any demonstrable neonatal benefit. However, one significant limitation of these studies is the fact that patients managed expectantly received neither corticosteroids nor prophylactic antibiotics. We lack sufficient evidence to support the routine use of corticosteroids after 32 weeks in pregnancies complicated by PROM. They may be an option in patients without contraindications up to 34 weeks' gestation (14).

## Aim of the work

The aim of this work is to compare between expectant management and early termination of pregnancy in pregnant women with premature prelabor rupture of membranes (between 32 and 34 weeks) on maternal and fetal outcomes.

## Patients and methods

The study was Prospective observational-interventional study carried out in Maternity Hospital in Obstetrics and Gynecology Department, University Hospitals at period from May 2018 till April 2020.

140 patients were included in the study divided into 2 groups:

**First group:** 70 patients with PROM between 32 and 34 weeks of gestation for conservative management.

**Second group:** 70 patients with PROM between 32 and 34 weeks of gestation for termination of pregnancy.

### Inclusion criteria:

- Singleton pregnancy.
- PROM between 32 and 34 weeks of gestation.
- Normotensive patients.
- No DM, heart disease or any chronic medical disease.
- Normal investigations (CBC, -ve CRP and urine analysis).
- Normal US (viable, cephalic presentation, normal site of placenta, adequate liquor or slightly diminished).

### Exclusion criteria:

- Abnormal (non-reassuring) cardiotocogram.
- Meconium-stained amniotic fluid.
- Signs of intrauterine infection.

- Major fetal anomalies.
- Drained liquor.
- Active labour.

**Plan of the study:**

All patients were submitted to the following:

I- **Informed written consent was taken from the pregnant women.**

II- **Full history taking**

III- **Clinical examination**

IV- **Laboratory investigations:**

- 1- Complete blood picture.
- 2- Fasting and 2 hours postprandial blood sugar.
- 3- Liver function tests.
- 4- Kidney function tests.
- 5- Complete urine analysis.

V- **Ultrasound to clarify:**

- 1- Fetal growth and viability.
- 2- Any congenital anomaly.
- 3- Placental site.
- 4- Amount of liquor amnii and its state.

Ruptured membrane was defined in the trial by clinical assessment with a sterile speculum examination and visualizing amniotic fluid passing through the cervical os and pooling in the posterior fornix of the vagina. No digital examination was done in absence of labour.

Patients were informed about the expectant management and its value and complications possible to occur and information about induction of delivery and its value and complications.

**Interventions**

**Expectant group (70 cases) (group I):**

The aim is to prolong the pregnancy to 36 or 37 weeks of gestation (but as long as no deterioration in maternal or fetal condition).

- Antibiotic (oral erythromycin 5000 mg every 6 hours), corticosteroids (dexamethasone 12 mg every 12 hours IM for 48 hours), Fortecortin vial IM once daily.
- CRP and white blood cell counts were measured every 48 hours.
- Temperature was measured twice daily.
- Non-stress test on admission and repeated twice weekly.
- Termination when one of the following occurs:
  - 1- Labor pains begin at any time (regular contraction, cervical dilation and effacement, ...).
  - 2- Clinical chorioamnionitis occurs (temperature > 37.5°C) on two occasions more than one hour apart or a temperature > 38°C with either uterine tenderness (or contraction), leukocytosis, maternal tachycardia, or a foul-smelling vaginal discharge, change of colour of AF (blood or meconium-stained).
  - 3- Antepartum hemorrhage.
  - 4- Non-reassuring fetal heart rate pattern.

Termination either by induction of labor by prostaglandin E<sub>2</sub> (Dinoprostine e.g. Dinoglandin one vaginal suppository) then oxytocin accordingly or CS when:

- Failed induction.
- Non-reassuring fetal heart rate pattern.
- Antepartum hemorrhage.
- Previous CS.
- CPD.

**Intervention group (induction or termination group) (70 cases) (group II):**

Antibiotic was given, and corticosteroids given. Then, termination of pregnancy within 5 days either by induction of vaginal delivery by prostaglandin E<sub>2</sub> (Dinoprostine e.g., Dinoglandin one vaginal suppository) then oxytocin or by CS if:

- Failed induction.
- Fetal distress.
- Previous CS.
- CPD.

**Measuring outcome**

**Neonatal outcome** was measured by:

- Apgar score.
- Admission to neonatal intensive care unit.

**Statistical analysis**

The clinical data were recorded on a report form. These data were tabulated and analyzed using the computer program SPSS (Statistical Package for Social Science)

**Results**

Weight in group I was  $2.6 \pm 0.35$  and in group II was  $1.83 \pm 0.29$ . So, there was high statistically significant difference between both groups regarding neonatal weight. There was statistically significant difference between both groups regarding neonatal RDS. The need for ventilation in group I was 11.4% and in group II was 14.3%. There was no statistically significant difference between both groups regarding the need for ventilation. Neonatal sepsis in group I was 31.4%, and in group II was 20%. There was statistically significant difference regarding neonatal sepsis between both groups. Neonatal mortality in group I was 2.9% and in group II was 14.3%. It means that there was statistically significant difference between both groups regarding neonatal mortality. There was no statistically significant difference regarding age between group I ( $28.1 \pm 4.08$ ) and group II ( $29.2 \pm 4.17$ ), no statistically significant difference regarding GA between group I ( $35.35 \pm 24.6$ ) and group II ( $33.2 \pm 5.6$ ) and parity. But, there was statistically a significant difference between group I and group II regarding gravidity. There was statistically significant difference, between both expectant and termination groups regarding mode of delivery. There were highly significant differences between both expectant and termination groups regarding maternal chorioamnionitis and postpartum endometritis.

	<b>Group I (expectant) (70 cases) Mean ± SD</b>	<b>Group II (active termination) (70 cases) Mean ± SD</b>	<b>P</b>
<b>Age (years)</b>	28.1 ± 4.08	29.2± 4.17	0.2 (NS)
<b>Gestational age (weeks)</b>	35.35 ± 4.6	33.2 ± 5.6	0.08 (NS)
<b>Gravidity (%)</b>			
Primigravida	7 (20%)	8 (22.9%)	S
Multigravida	28 (80%)	27 (77.1%)	
<b>Parity</b>			
Nullipara	8 (22.9%)	9 (25.7%)	0.672 (NS)
Multipara	27 (77.1%)	26 (74.3%)	

**Table 1:** Clinical characteristics in both groups.

<b>Groups MOD</b>	<b>Expectant (70 cases)</b>		<b>Active (70 cases)</b>		<b>P</b>
	<b>No</b>	<b>%</b>	<b>No</b>	<b>%</b>	
<b>CS</b>	24	34.3	40	57.1	0.000 (S)
<b>NVD</b>	4	65.7	30	42.9	

**Table 2:** Comparison between both groups as regards mode of delivery.

<b>Groups Maternal outcome</b>	<b>Expectant (70 cases)</b>		<b>Active (70 cases)</b>		<b>p</b>
	<b>No</b>	<b>%</b>	<b>No</b>	<b>%</b>	
<b>Chorioamnionitis</b>					
-ve	56	80	70	100	0.000 (HS)
+ve	14	20	0	0	
<b>Maternal endometritis</b>					
-ve	52	74.3	68	47.1	0.001 (HS)
+ve	18	25.7	2	2.9	

**Table 3:** Comparison between both groups as regard maternal outcome.

<b>Group Neonatal outcome</b>	<b>Expectant (70 cases)</b>		<b>Active (70 cases)</b>		<b>p</b>
	<b>No</b>	<b>%</b>	<b>No</b>	<b>%</b>	
<b>Apgar score</b>					
< 7	8	11.4	12	17.1	0.2754 (NS)
≥ 7	62	88.6	58	82.9	
<b>Neonatal weight</b>					
Mean ± SD	2.6 ± 0.35		1.83 ± 0.29		0.0001 (HS)
Range	2.3-2.8		1.5-2.2		
<b>Neonatal RDS</b>					
-ve	56	80	40	57.6	S
+ve	14	20	30	42.4	
Grade I	10	14.3	4	5.7	
Grade II	4	5.7	10	14.3	

Grade III	0	0	8	11.4	
Grade IV	0	0	4	11.4	
<b>Ventilation</b>					
-ve	62	88.6	60	85.7	0.4449 (NS)
+ve	8	11.4	10	14.3	
<b>Neonatal sepsis</b>					
-ve	48	68.6	56	80	0.0001 (S)
+ve	22	31.4	14	20	
<b>Neonatal mortality</b>					
-ve	68	97.1	60	85.7	0.008 (S)
+ve	2	2.9	10	14.3	

**Table 4:** Comparison between both groups as regards neonatal outcome.

## Discussion

Premature Prelabour Rupture of Membranes (PPROM) is an important clinical problem and a dilemma for the gynaecologist. On the one hand, awaiting spontaneous labour may lead to an increase in infectious disease for both mother and child, whereas on the other hand, induction of labour leads to preterm birth with an increase in neonatal morbidity e.g. Respiratory Distress Syndrome (RDS) and a possible rise in the number of instrumental deliveries (11).

Cox and Leveno (1995) suggested that expectant management after 32 weeks leads only to an increased rate of chorioamnionitis and longer maternal and neonatal hospitalization, without any demonstrable neonatal benefit (15). Neerhof et al. (1999) have demonstrated benefits in conservative management for gestations of less than 34 weeks. (16)

The aim of this work is to compare between expectant management and early termination of pregnancy in pregnant women with premature prelabor rupture of membranes (between 32 and 34 weeks) on maternal and fetal outcomes.

### **Regarding maternal outcomes in the present study:**

(a) Chorioamnionitis in group I was encountered in 14 cases (20%) and this was significantly higher than that encountered in group II i.e. chorioamnionitis increases with expectant management.

(b) Endometritis in group I was found in 18 cases (25.7%) while only 2 cases in group II developed endometritis and this indicates a highly significant difference between both groups i.e. endometritis increases with expectant management.

**In supporting our results, Mercer et al. (2005)** assigned 93 women with PPRM between 32 weeks and 36 weeks and 6 days of gestation either to immediate or delayed delivery showed that in the expectantly managed group, there was 27.7% incidence of chorioamnionitis which was higher than the 10.9% in the induced group. However, this difference did not reach statistical significance (17).

In another report, 129 women with PROM between 30 weeks and 34 weeks of gestation were randomly assigned to either immediate delivery or expectant management (Cox and Leveno, 1995). The mean gestational age of delivery was 31.7 weeks in the immediate delivery group and 32 weeks in those managed expectantly. The incidence of chorioamnionitis as significantly less in the immediate delivery group (2%) as compared to the expectant management group (15%,  $p < 0.05$ ) (15).

In a prospective randomized study of 120 women with PPRM between 34 weeks and 37 weeks of gestation, the expectantly managed group had a higher incidence of chorioamnionitis (16%). Compared with the immediate delivery group (2%,  $p < 0.05$ ). The incidence of sepsis as 5% in the expectantly managed group and 0% in the immediate delivery group, but this was not statistically significant (18).

### **Regarding neonatal outcomes in the present study:**

**(a)** Neonatal sepsis in group I was found in 22 cases (31.4%) and in group II in 14 cases (20%), and this is statistically of significant difference between two groups; so, neonatal sepsis is more occurring with group I (expectant management).

**(b)** Neonatal RDS:

**Grade I:** 10 cases (14.3%) in group I and 2 cases (5.7%) in group.

**Grade II:** 4 cases (5.7%) in group I and 5 cases (14.3%) in group II.

**Grade III:** None in group I and 8 cases (11.4%) in group II.

**Grade IV:** None in group I and 8 cases (11.4%) in group II. This means that it is statistically of significant difference between both groups and so RDS is more with group II (induction group).

**In supporting our results,** the incidence of respiratory distress syndrome and the length of hospital stay were reduced in infants delivered after 34 weeks of gestation. The incidence of respiratory distress syndrome as 22.5% and 5.8% at 33 and 34 weeks, respectively. Although the incidence beyond 34 weeks was relatively low, the

condition affected infants at 36 weeks, with incidence of 10.4-1.5% at 35 and 36 weeks, respectively (16).

Lieman et al. (2005) examined 430 women with PPROM demonstrating that composite neonatal minor morbidity such as hyperbilirubinaemia and transient tachypnoea of the newborn was significantly higher among pregnancies delivered at 34 weeks of gestation or less as compared with those delivered at 36 weeks (12).

Composite major neonatal morbidity, including respiratory distress syndrome and interventricular haemorrhage, was significantly higher among pregnancies delivered at 33 weeks of gestation or less as compared with those delivered at 36 weeks. There was no difference in the major morbidity rates for those pregnancies delivered beyond 34 weeks. The conclusion was that expectant management at 34 weeks and beyond is of limited benefit (12).

**Against our results,** Cox and Leveno (1995) compared maternal and neonatal outcome in a group of 129 patients with PROM occurring at 30 until 34 weeks of gestation after randomization between expectant management and induction of labour. Again, no significant differences in neonatal outcome were noted (15).

**(c) Regarding ventilation,** 8 cases (11.4%) were found in group I and 10 cases (14.3%) were found in group II. So, it is statistically of no significant difference between both groups.

**(d) Regarding neonatal mortality,** 2 cases (2.9%) was found in group I and 10 cases (14.3%) were found in group II. This is statistically of non-significant difference between both groups.

**(e) Regarding Apgar score (in 5 minutes) < 7,** 8 cases (11.4%) were found in group I and 12 cases (17.%) were found in group II. This is statistically of no significant difference between both groups.

**Mercer et al. (1993)** reported the number of neonates whose Apgar scores were less than seven at five minutes. There was no significant difference in this outcome between those babies delivered early to those managed expectantly. (13)

## Conclusion

From the current study, the following can be concluded:

- Expectant management increases the probability of infectious disease for both mother (chorioamnionitis and endometritis) and neonate (neonatal sepsis).
- Induction of labour leads to preterm birth with increase in neonatal morbidity (RDS).
- The worst prognosis of neonatal morbidity is due to prematurity.
- Expectant management is more accepted from patients and it is associated with less complications than early termination of pregnancy but when:
  - c) Proper use of medications (antibiotics, corticosteroids and short-term tocolytics).
  - d) Close observation for both maternal and fetal wellbeing.

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