

# Planned Early Birth Versus Expectant Management of Premature Rupture of Membranes At Term

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## Abstract

**Background:** At term, immediate delivery is found to be associated with a lower risk of maternal infection and high maternal satisfaction as compared to expectant management.

**Objective:** This study was done to determine the neonatal and maternal outcomes of planned early birth versus expectant birth in management of prelabour rupture of membranes at term.

**Patients and Methods:** This study was non-randomized interventional study conducted at the labour ward of the maternity teaching hospital in Erbil city, Kurdistan-Iraq from 1st of January to 30th of June, 2010. A sample of one hundred eligible pregnant women was non-randomly assigned in two groups. Both groups were matched for age and gestational age. The first group included 50 women in which labour was induced with oxytocin. In the second group, 50 women were included for labour to begin spontaneously.

**Results:** Mode of delivery was significantly ( $p < 0.001$ ) associated with parity in both study groups. The differences in maternal and neonatal outcomes for both study groups were not significant. The time to active labour from admission, time of active labour and time from rupture membrane to delivery were significantly ( $p < 0.001$ , 0.03,  $< 0.001$ , respectively) longer among women of expectant group.

**Conclusion:** Maternal and neonatal outcomes of both induction and expectant labour were similar although, labour duration was longer among women in expectant group.

**Key words:** Labour, Early Birth, Membranes at term.

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## Introduction

Premature rupture of membranes (PROM) is known as a spontaneous leakage of amniotic fluid from the amniotic sac. This fluid leakage is reported before 37 weeks of gestation and at least one hour before the onset of labour [1]. The PROM is detected in 20% of all births and 40% of all preterm births [2]. The main risk factors for PROM are multiple pregnancy, smoking, amniotic membranes mechanical dysfunction, recurrent digital examinations, coitus and infection [3]. The frequent

complications of PROM are prematurity, placental abruption, ascending infection, intrapartum fetal distress, cord prolapse and abruptio placentae [4].

At term, immediate delivery is found to be associated with a lower risk of maternal infection and high maternal satisfaction as compared to expectant management; however no difference in perinatal morbidity or mortality risks were proved [5]. The risk of maternal and fetal infection increased with increased time between the rupture of the membranes and the onset of

labour. As a result, many literatures recommended labour induction for term pregnancy especially if labour does not begin spontaneously shortly after the membranes rupture [6]. Other authors believe that spontaneous labour is better for mothers if there is no evidence of fetal or maternal complication [7]. Moreover, the decision for labour induction is often highly related to the convenience of the physicians, nurses, or midwives than to the actual time that has elapsed after rupture of the membranes [8]. The labour induction is related to cervix status, immature cervix lead to increased labour duration and caesarean section [9]. Planned early birth and expectant management are experienced differently by women, as this experience is related to health and non-health outcomes and process attributes [10].

The decision of induced versus expectant is a fateful choice linked to maternal and neonatal outcome. However, literatures on this issue in Iraq are scarce. This study was carried out to determine the neonatal and maternal outcomes of planned early birth versus expectant birth in management of premature rupture of membranes at term.

### **Patients and Methods**

This study was a non-randomized interventional study conducted at the labour ward of the maternity teaching hospital in Erbil city, Kurdistan-Iraq from 1st of January to 30th of June, 2010. All pregnant women at term with PROM were included in the study. The inclusion criteria were pregnancy at more than 37 weeks of gestation, ruptured membrane <48 hours and single fetus in a cephalic presentation. The exclusion criteria were active labour, placenta previa, poor obstetric history, contraindication to expectant management such as meconium staining of amniotic fluid, maternal infection, medical diseases, multiple pregnancy, history of intrauterine growth restriction and previous cesarean section.

A sample of one hundred eligible pregnant women was non-randomly assigned to two groups. Both groups were matched for age and gestational age. The first group included 50 women in which labour was induced with oxytocin. In the second group, 50 women were assigned for labour to begin spontaneously unless there was evidence of fetal or maternal compromise, or until 48 hours had elapsed, in which case labour was induced with oxytocin in the expectant management [5].

For women assigned for induction with oxytocin 5 I.U. (=8.33 $\mu$ g) [manufactured by Biological Italia laboratories, in Via Cavour 41/43-20026 Novato Milanese-Italy], an infusion of oxytocin was initiated and the infusion rate was monitored until efficient uterine contraction started. Women were examined regularly; temperature was measured twice daily and reported any fever, change in the color or odor of the amniotic fluid, or other complications. Additional monitoring tests (partography, biophysical profile) were done. Neonates were examined by pediatric senior house officers, the following information have been collected: birth weight, gestational age, Apgar score at 1minute and Apgar score at 5minutes, temperature, resuscitation with oxygen, admission to Neonatal Intensive Care Unit (NICU) and duration of admission to NICU.

This study was approved by the research ethics committee of the college of medicine of Hawler medical university. An informed oral consent was obtained from each selected women before being enrolled in the study.

### **Statistical analysis**

The statistical analysis was conducted using Statistical Package for Social Sciences (SPSS) version 23. Multiple contingency tables and appropriate statistical tests were performed. Chi-square test was used to compare categorical variables. Fishers' exact test was used when total of expectant variables was less than 20%. Independent

sample t-test was used to compare two means. In all statistical analysis, p value at  $\leq 0.05$  was considered statistically significant.

## Results

Most (90%) of total pregnant women in induction group were significantly delivered by induced vaginal delivery while 80% of pregnant women in expectant group were significantly delivered by spontaneous vaginal delivery ( $p < 0.001$ ). For nulliparous pregnant women, induced vaginal delivery was significantly delivery mode of induction

group women and spontaneous vaginal delivery was significantly delivery mode of expectant group women ( $p < 0.001$ ). For women with positive parity history, there was a significant association between women of induction group and induced vaginal delivery, in same direction, a significant association was observed between women of expectant group and spontaneous vaginal delivery ( $p < 0.001$ ) Details are shown in Table 1.

**Table (1):** Distribution of modes of delivery in both study groups (N=50 for each group).

Variable	Induction group		Expectant group		P value
	No.	%	No.	%	
Mode of delivery for women with parity=0					<0.001**
Spontaneous VD	0	-	19	79.2	
Induced VD	26	86.7	3	12.5	
Cesarean section	4	13.3	2	8.3	
Mode of delivery for women with parity $\geq 1$					<0.001**
Spontaneous VD	0	-	21	80.8	
Induced VD	19	95.0	2	7.7	
Cesarean section	1	5.0	3	11.5	
Mode of delivery for total women					<0.001*
Spontaneous VD	0	-	40	80.0	
Induced VD	45	90.0	5	10.0	
Cesarean section	5	10.0	5	10.0	

\*Chi-square test, \*\*Fishers exact test, -VD=vaginal delivery.

Post-partum fever, meconium staining of amniotic fluid, number of digital vaginal examinations and antibiotics use were more prevalent among women of expectant group. Similarly, neonates of women in expectant group had higher infection rate, lower APGAR score at 5 minutes, higher NICU

admission frequency and duration than neonates of women in induction group. Although, no significant differences were observed between two study groups regarding maternal and neonatal outcomes (Table 2).

**Table (2):** Distribution of maternal and neonatal outcomes in both study groups (N=50 for each group).

Variable	Induction group		Expectant group		P value
	No.	%	No.	%	
Post-partum fever					0.6**
Yes	2	4.0	4	8.0	
No	48	96.0	46	92.0	
Meconium staining of amniotic fluid					0.1**
Yes	0	-	4	8.0	
No	50	100.0	46	92.0	
No. of digital vaginal examinations					0.6**
< 4	27	54.0	23	46.8	
4-8	20	40.0	22	44.0	
> 8	3	6.0	5	10.0	
Antibiotics before or during labour					0.4**
Yes	48	96.0	50	100.0	
No	2	4.0	0	-	
Neonatal infection					0.9**
Yes	1	2.0	2	4.0	
No	49	98.0	48	96.0	
APGAR score at 1 minute					1.0*
<7	6	12.0	6	12.0	
≥7	44	88.0	44	88.0	
APGAR score at 5 minutes					0.9**
<7	2	4.0	1	2.0	
≥7	48	96.0	49	98.0	
NICU admission					0.1*
Yes	3	6.0	9	18.0	
No	47	94.0	41	82.0	
NICU admission duration					0.4**
<24 hours	2	66.7	8	88.9	
≥24 hours	1	33.3	1	11.1	

\*Chi-square test, \*\*Fishers exact test, -NICU=Neonatal Intensive Care Unit.

The time to active labour from admission was significantly longer among women of expectant group ( $p < 0.001$ ). There was a significantly shorter duration of active

labour for women of induction group ( $p = 0.03$ ). Time from rupture membrane to delivery was significantly longer for women of expectant group ( $p < 0.001$ ). Details are shown in Table 3.

**Table (3):** Distribution of labour-related variables in both study groups (N=50 for each group).

Variable	Induction	Expectant	P value
	Mean±SD	Mean±SD	
Time to active labour from admission (hr)	5.5±2.4	18.7±4.8	<0.001*
Duration of active labour (hr)	5.2±1.9	6.2±2.7	0.03*
Time from rupture membrane to delivery (hr)	16.9±6.2	33.7±8.4	<0.001*

\*Independent sample t-test

## Discussion

The final obstetrical decision needs evaluation of common risks and advantages of labour induction against expectant labour of pregnant women at term or when there are severe complications. Each labour management aims to increase the advantages of fetal maturity and lowering risk of delivery [11].

This study revealed that most of women in induction group were significantly delivered by induced vaginal delivery while most of women in expectant group were delivered by spontaneous vaginal delivery, irrespective of parity of women. This finding is consistent with previous study in Iraq [12]. Conducted on 400 pregnant women at term admitted to Basra maternity and child teaching hospital and revealed that women in induction group had high rates of delivery obstacles and primigravida women in induction group had high rates of secondary interventions in comparison to control group of women.

The present study showed no significant differences in maternal and neonatal outcomes between the two study groups. This finding is inconsistent with that of an American study, which demonstrated a significant predominance of maternal infection among women of induction group. This difference might be attributed to much larger sample size of the American study that included 6814 pregnant women [13]. Another American study showed that women of the expectant group had higher risk of maternal infections which lead to neonatal

infection and mortality [14]. Caughey *et al* [15] stated that induction of pregnant women at term might be related to lowering of cesarean section rates and meconium stained amniotic fluid.

The longer time to active labour from admission, time of active labour and time from PROM to delivery in the current study among women of expectant group are similarly reported by a previous Australian study which found longer durations of expectant group women and reported no profound effect of induction labour for managing pregnant women complicated with PROM in comparison to expectant labour [5]. Other studies indicated that neonatal and maternal complications probability raised as time between membrane rupture and birth increased [16]. There is a higher cost benefit and patients satisfaction from labour induction in comparison to expectant due to shorter duration of labour induction [16][17]. The main limitations of this study were the non-randomization of study population and small sample size; in addition to that it is single center study.

In conclusions, maternal and neonatal outcomes of both induction and expectant labour were similar, although, labour duration was longer among women in expectant group. Further multi-center large sample studies on labour induction must be supported.

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