

## EARLY PLANNED BIRTH: A BETTER WAY TO MANAGE PRE-LABOR RUPTURE OF MEMBRANES AT TERM

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### ABSTRACT

**Objective:** To compare mean pre-labour rupture of membranes (PROM)-delivery time, hospital stay, frequency of caesarean section and fetal distress associated with immediate induction versus expectant management with delayed induction in women presenting with pre-labour rupture of membranes at term.

**Study Design:** Quasi-experimental study.

**Place and Duration of Study:** Gynae/Obs. Unit of Shifa International Hospital, Islamabad, from Sep 2013 to Mar 2014.

**Methodology:** A total of 294 pregnant females with gestational age between 37-41 weeks with singleton pregnancies and cephalic presentation presenting with pre-labour rupture of membranes were enrolled and equally distributed to two groups. Group A females were immediately induced with 50 micrograms of misoprostol per vaginally and group B was managed expectantly for 12 hours followed by labor induction with 50 micrograms of misoprostol per vaginally if labor did not ensue spontaneously in 12 hours.

**Results:** Mean pre-labour rupture of membranes to delivery time was significantly shorter in immediate induction group when compared to the expectant group with delayed induction ( $6.93 \pm 2.43$  versus  $19.25 \pm 5.38$  hours,  $p=0.001$ ). Frequency of hospital stay of  $>3$  days was also significantly lower in immediate induced group (29.9%  $n=44/147$  versus 40.1%  $n=59/147$ ,  $p=0.036$ ). Higher percent-age of caesarean section (53.7%  $n=79/147$  versus 44.9%  $n=66/147$ ,  $p=0.129$ ) and fetal distress (46.3%  $n=68/147$  versus 38.8%  $n=57/147$ ,  $p=0.129$ ) were observed in immediate induction group.

**Conclusion:** The mean pre-labour rupture of membranes to delivery interval and hospital stay was significantly less in immediate induction when compared to expectant management with delayed induction group. Rates of caesarean sections and fetal distress among both groups were similar.

**Keywords:** Expectant management, Feto-maternal Outcomes, Labor induction, Pre-labour rupture of membranes.

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### INTRODUCTION

Pre-labour rupture of membranes (PROM) is defined as rupture of the membranes with leakage of amniotic fluid in the absence of uterine activity<sup>1</sup>. The phenomenon has been observed in about 8-10% of term pregnancies<sup>2</sup>. It has been reported that PROM is associated with increased operative interference, maternal complications, neonatal morbidity and in some cases, mortality<sup>3,4</sup>. When PROM occurs at term, spontaneous labour usually follows or labour is induced within 12-24 hours<sup>5</sup>, however, if the interval is prolonged, an increase in the incidence of chorioamnionitis and neonatal sepsis has been reported<sup>6</sup>. Management options include immediate induction of labour versus delayed induction or expectant management<sup>7</sup>. The management of PPRM is one of the most debatable issues in perinatal medicine. Points of disagreements include: Expectant management versus intervention, use of tocolytics, duration of administration of prophylactic antibiotics, timing of administration of antenatal cortico-

steroids, methods of testing for maternal/fetal infection and timing of delivery<sup>8-10</sup>. Evidence on the subject proposes the idea that induction of labour reduces the risk of chorioamnionitis and neonatal infection without any increase in the caesarean delivery rate<sup>11</sup>. A conservative approach, nonetheless, is justified if the woman wishes to wait for the spontaneous onset of labour. The present study was planned to compare immediate induction of labour with delayed induction in terms of fetomaternal outcomes in our local population and local settings of neonatal care. This would help us in identifying the better approach to manage such women in order to improve the fetometranal outcomes and develop our national guidelines.

### METHODOLOGY

This quasi experimental study was conducted at Gynae/Obs. Unit of Shifa International Hospital, Islamabad, from September 2013 to March 2014 after obtaining approval from hospital ethics committee. Non probability consecutive sampling technique was used and all pregnant females with gestational age between 37-41 completed weeks with singleton pregnancies and cephalic presentation presenting with Pre-

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labour rupture of membranes were enrolled. A well informed written consent was obtained from all the participants of study. The sample size was calculated by taking (level of significance: 5%, Power of test: 80% anticipated population proportion 1: 28% and anticipated population proportion 2: 16%)<sup>12</sup>. Women in active labor (regular palpable uterine contractions) at the time of presentation, history of previous uterine surgery and all high risk pregnancies (Antepartum hemorrhage, Chorioamnionitis at presentation, Pre-eclampsia or eclampsia) were excluded. PROM was clinically diagnosed as rupture of membranes with leakage of amniotic fluid in the absence of uterine activity. A total of two hundred and ninety four (n=294) women were finally enrolled and allocated to two groups (n=147 in each group) by lottery method. Females in group A were immediately induced with 50 micrograms of misoprostol per vaginally and patients in group B were managed expectantly for 12 hours with periodical fetomaternal monitoring (CTG 2 hourly and maternal vital signs 6 hourly), followed by labor induction with 50 micrograms of misoprostol per vaginally if labor did not ensue spontaneously in 12 hours. Women in both group A and B had a repeat dose of misoprostol (50 ug) if the bishop score did not improve, maximum 3 doses, 6 hours apart. As the risk of chorioamnionitis appeared to increase significantly if expectant management is delayed, in the present study we only waited for 12 hours for in expectant management group<sup>13</sup>. Fetomaternal outcomes were observed in terms of; the mean time from PROM till delivery of the baby, frequency of >3 days hospital stay, Frequency of caesarean section and fetal distress (diagnosed on Non-reactive CTG and/or meconium stained liquor). Data entered and analyzed using SPSS-19. For qualitative variables like caesarean section, fetal distress, frequency and percentages were calculated. For quantita-

tive variables like age, gestational age, parity and PROM to delivery time mean ± standard deviation were estimated. Chi-square test for qualitative variables, independent sample student t-test for quantitative variables was applied to assess the significance of observed difference between two groups, *p*-value of ≤0.05 was considered significant.

**RESULTS**

Baseline demographic characteristics (mean age in years, parity and gestational age in weeks) in both the study groups are summarized in table-I. Mean PROM to delivery time was significantly shorter in immediate induction group when compared to the expectant group with delayed induction (6.93 ± 2.43 versus 19.25 ± 5.38 hours, *p*=0.001). The results are summarized in table-II. Frequency of Hospital stay of >3 days was significantly lower in immediate induction group (29.9% n=44/147 versus 40.1% n=59/147, *p*=0.036). Higher percentage of caesarean section (53.7% n=79/147 versus 44.9% n=66/147, *p*=0.129) and fetal distress (46.3%

**Table-I: Demographic profile of study population.**

Groups	Immediate Induction (Mean ± SD)	Expectant Management With Delayed Induction (mean ± SD)
Age (years)	28.4 ± 4.2	27.9 ± 4.5
Parity (number)	1.8 ± 1.4	1.6 ± 1.5
Gestational Age (Weeks)	38.5 ± 1.2	38.6 ± 1.3

**Table-II: Mean time to delivery in both groups.**

Group	Mean time to delivery (Hours)	SD (Hours)	<i>p</i> -value
A (Immediate Induction)	6.93	2.43	0.001
B (Expectant Management With Delayed Induction)	19.25	5.38	

**Table-III: Hospital stay, frequency of C-section and fetal distress in both groups.**

Outcomes		Groups		Total	<i>p</i> -value Chi Square
		Immediate Induction	Expectant Management with Delayed Induction		
Hospital Stay >3 Days	Yes	44 (29.9%)	59 (40.1%)	103 (35.1%)	0.007
	No	103 (70.1%)	88 (59.9%)	191 (64.9%)	
	Total	147 (100%)	147 (100%)	294 (100%)	
C. Section	Yes	79 (53.7%)	66 (44.9%)	145 (49.3%)	0.129
	No	68 (46.3%)	81 (55.1%)	149 (50.7%)	
	Total	147 (100%)	147 (100%)	294 (100%)	
Fetal Distress	Yes	68 (46.3%)	57 (38.8%)	125 (42.5%)	0.194
	No	79 (53.7%)	90 (61.2%)	169 (57.5%)	
	Total	147 (100%)	147 (100%)	294 (100%)	

n=68/147 versus 38.8% n=57/147,  $p=0.129$ ) was observed in immediate induction group, however, the difference was not statistically significant. These results are summarized in table-III. We did not find any association of Bishop Score with study outcomes in both the groups.

## DISCUSSION

Controversies still exists in the management of PPRM<sup>14,15</sup>. Current study was planned to compare fetomaternal outcomes of immediate induction of labour with delayed induction in patients who presented with pre-labour rupture of membranes at term. Our results showed that the mean time to delivery was significantly shorter in immediate induction group as compared to the expectant group with delayed induction ( $p=0.001$ ). Hospital stay of >3 days was significantly lower in immediate induction group ( $p=0.036$ ). Caesarean section rate and fetal distress rate was higher in immediate induction group, however, the difference was not statistically significant ( $p>0.05$ ). Our results are in concordance already published data on the subject. Shah *et al*<sup>16</sup>, assessed the efficacy of early labour induction versus expectant management in women with term PROM. They reported that PROM-delivery interval was significantly lower in induced group when compared with expectant group (22 h versus 13 h,  $p<0.001$ ), rate of cesarean sections, however, remained almost same in both groups ( $p>0.05$ ). Similar results were reported by Poornima *et al*, who recorded higher rates of cesarean sections and fetal distress in immediate induction group when compared to delayed induction ( $p>0.05$ )<sup>12</sup>. Induction to delivery was  $12.7 \pm 6.2$  versus  $7.8 \pm 1.7$  hours, in early induction group as compared to delayed induction. Kehl *et al*, in their historical cohort study aimed to evaluate the impact of PROM on the induction of labour. They analyzed almost 2000 women with PROM for 5 years. They compared two groups, one with induction of labour for PROM (PROM group) and other was induction for other indications (no-PROM group). Their primary outcome was the cesarean section rate. They reported that Caesarean section rate for the PROM group was significantly lower ( $p=0.029$ ). The induction-to-delivery interval was shorter (mean: 972 min vs. 174 min,  $p<0.0001$ ) in the PROM group. They further conducted a multivariate analysis, which showed a non-significant influence of PROM on the C section rate. PROM, nonetheless, had the greatest impact on the induction-to-delivery interval ( $p<0.0001$ ). A study by Kupra Shah and Haresh Doshi conducted in India showed that

PROM-Delivery interval was 22 hrs in expectant group while in early induction group it was 13 hrs but rate of caesarean section remained almost same in both groups. Krupa *et al*, compared immediate induction of labour with vaginal misoprostol versus expectant management for 24 hours followed by oxytocin induction in women with PROM at term. They found that the misoprostol group had a significantly a shorter time interval from recruitment to delivery (18.9 vs 27.5 hours) and a shorter period of maternal hospitalization. Dare *et al*, assessed the effects of planned early birth versus expectant management for women with term PROM on fetal, infant and maternal well-being. They reported that planned management (with methods such as oxytocin or prostaglandin) reduces the risk of some maternal infectious morbidity without an increase in caesarean sections rate and operative vaginal births. Fewer infants went to neonatal intensive care under planned management although no differences were seen in neonatal infection rates. Middleton *et al*, in their recent systematic review on the subject reported that in general, women in the planned early birth group showed a shorter time from rupture of membranes to birth and had a shorter length of hospitalization. They further detailed that majority of studies contributing data had some serious design limitations with lack of precise estimates of outcome measures and any further attempts to gather evidence review the benefits or harms of planned early birth compared with expectant management, taking in account the maternal, fetal, neonatal and longer-term childhood outcomes along with the use of health services, would be valuable.

There are some limitations in this study. Firstly, the sample size was relatively smaller yet adequate enough to draw the inference. Secondly, we did not compare neonatal outcomes NICU admissions and neonatal sepsis, and finally, we did not assess the acceptability of immediate labour induction by the women.

In summary, present study and already published results on the subject revealed that planned early birth with induction compared with expectant management in females with PROM at term reduces the PROM to delivery and hospitalization time without significantly increased risk of caesarean section and fetal distress. We recommend women need to have appropriate information to make informed choices, as immediate induction and expectant management with delayed induction may not be very different. We suggest further studies taking in account other neonatal out-

comes like NICU admissions and neonatal sepsis and women acceptability for immediate labour induction.

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### CONCLUSION

We conclude that in females with PROM at term, planned early birth with induction resulted in comparable fetometernal outcomes when compared with expectant management. Though the foetal distress and C-section rates were higher with immediate induction group, yet the difference was not statistically significant. However, the mean PROM to delivery interval and hospital stay was significantly shorter in immediate induction when compared to expectant management with delayed induction group.

### CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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