



A COMPARATIVE STUDY ON IMMEDIATE VERSUS DELAYED INDUCTION IN PREMATURE RUPTURE OF MEMBRANES AT TERM

Obstetrics & Gynaecology

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ABSTRACT

Introduction: Premature rupture of membranes (PROM) has an incidence of about 8-10% of all pregnancies and is a very significant event. As the interval between the rupture of membranes at term and delivery increases, so does the risk of foetal and maternal infection. Some believe that expectant management doesn't increase the perinatal and maternal mortality & immediate induction leads to an increased caesarean section rate; while some believe that there is increased incidence of neonatal & maternal infection if the delivery occurs beyond 24 hours following PROM.

Aims & Objectives: This study was an attempt to compare the neonatal and maternal outcome between immediate versus delayed induction with oxytocin at term in PROM at our hospital.

Material & Methods: A hospital-based study in women admitted to Obstetrics & Gynaecology department; SMCH, Silchar was conducted with sample size of 140 patients in the age group between 19-35 years with gestational age between 37-42 weeks. Women were randomly assigned to early induction (within 6 hours) of labour with oxytocin or delayed induction (within 12 hours) with oxytocin & results compared. Statistical analysis used student's t-test, chi-square test with 95% confidence interval.

Results: The rates of CS and neonatal infection were not significantly different among both groups. However, induction to delivery interval was significantly less in early induction group. Clinical chorioamnionitis was less likely to develop in early induction group. C-section for the indications of failed induction and non-progress of labour were significantly higher in the early group.

Conclusion: Delayed induction after a waiting period of 12 hours could be a reasonable option in term PROM and it decreases the number of operative deliveries without compromising the maternal & neonatal outcome.

KEYWORDS

PROM, early induction, delayed induction,

INTRODUCTION

Amniotic cavity is surrounded by membranes that are composed of amnion and chorion. The amnion and chorion are closely adherent and are consists of epithelial cells, trophoblast, mesenchymal cells etc. that are embedded in a collagenous matrix. The membranes contain the amniotic fluid, exchanges substances to and from the amniotic fluid and towards the uterus, and protects the developing fetus from ascending infections of the reproductive tract. Usually the membranes rupture at the time of labour. If the membrane ruptures before the onset of labour it is termed as Premature rupture of fetal membranes irrespective of gestational age.¹

The membrane ruptures before labour in approximately 8 percent of ladies with term pregnancies.² More than 60 % of these women begin spontaneous labour within 24 hours and 95% within 72 hours even if labour is not induced.^{2,3} The maternal and fetal risk of infection increases as the time gap between rupture of membranes and the onset of labour increases. So, many physicians advocate to induce labour if it does not begin shortly after the rupture of the membrane at term pregnancy.^{4,5} Another group prefers to wait for the labour to begin spontaneously if there is no compromise of the fetus or the mother.^{6,7} The timing for induction of labour after premature rupture of fetal membranes is controversial.

Several complications of pregnancy are associated with Premature rupture of membranes at term. Maternal and fetal infection risks are proportional to the interval between the rupture of membranes and delivery. There are studies showing that the rate of chorioamnionitis is approximately 10% for premature rupture of membranes, and rises close to 40% if the membranes are ruptured for more than 24 hours.⁸ Some other studies report that in ruptured membranes of more than 24 hours there can be infections in neonates in at least 2-3% cases, which is 10 times higher compared to all deliveries. With chorioamnionitis this rate increases to 5%.⁹ Maternal and neonatal morbidity increases drastically because of these infections. Even though PROM occurs in 8% of term pregnancies without labour², its definite management remains controversial.

MATERIALS AND METHODS

During the period of 1st July 2018 to 30th June 2019, 140 pregnant women of 37-41 weeks gestation having spontaneous rupture of membranes, attending SMCH were included in a hospital based

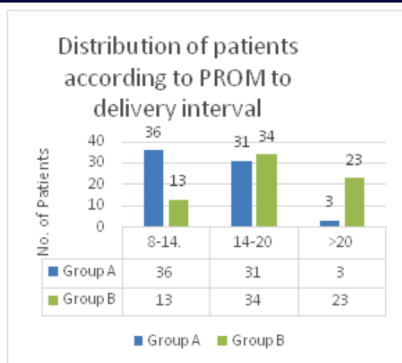
randomised comparative clinical study. The 140 women were grouped into 2 groups of 70 each. Immediate induction (within **6 hours**) was compared with delayed induction with oxytocin drip after a period of **12 hours** following PROM in both groups. **Inclusion criteria**- women who had ruptured membranes, were at ≥ 37 weeks' gestation and had a single foetus in a cephalic presentation with lack of uterine contraction for at least an hour with cervical dilatation < 3 cm at presentation. Rupture of membranes was determined clinically and confirmed by positive Litmus (Nitrazine paper) test. Per vaginal examination was restricted to single, sterile, digital examination on admission to note the Bishop's Score, clinical pelvic assessment and to rule out any concomitant cord prolapse or foetal distress. Investigations like CBC, Urine R/E, KFT, Electrolytes and virology were done. Prophylactic antibiotics in the form of injection Ceftriaxone 1g I/V ANST was given twice daily for at least 48 hours. A cardiotocography was also done on admission. Any patient with a non-reassuring CTG tracing were excluded from the study. This study was approved by the research-ethics committee of SMCH.

RESULTS AND OBSERVATIONS

Out of **11,814** deliveries there were **720** cases of PROM, the incidence was calculated to be **6.09%**. Most of the patient delivered within 14-20 hours following PROM. The shortest PROM-delivery interval was 8 hours (in the early induction group). The longest PROM-delivery interval was 30 hours (patient in the delayed induction group). More patients in the early induction group (51%) delivered within 8-14 hours whereas most patients in the delayed induction group (46%) delivered within 14-20 hours. The average duration from PROM to delivery in the early group was 14 hours as compared to 19 hours in the delayed group. The PROM-delivery interval was significantly more in the delayed group as compared to the early induction group (**p-value = 0.00<0.05, significant**).

Table 1: Shows the distribution of the patients according to their time interval between rupture of membranes and delivery.

Serial No.	Time Interval (hr)	Group A N=70	Group B N=70	Total N=140
1.	8-14	36(51.42%)	13(18.57%)	49(35.0%)
2.	14-20	31(44.28%)	34(48.57%)	65(46.43%)
3.	>20	3(4.29%)	23(32.86%)	26(18.57%)
Mean $\pm$ SD		14.01 $\pm$ 4.70	19.92 $\pm$ 5.35	



Out of 70 patients in the early induction group, 51% had an NVD, 11% had an assisted forceps delivery, 5% (4 cases) had an assisted Ventouse delivery and 31% had an LSCS. In the delayed induction group, 65% had an NVD with 8% having a forceps delivery and 5% (4 cases) had a Ventouse delivery. Lesser number of patients in this group (20%) had a caesarean section, as compared to early induction group. This difference however did not reach a statistical significance (p value-0.35>0.05).

Table 2: Shows the modes of delivery in both the early and the late induction groups.

Sl. No.	Mode of Delivery	Group A N=70	Group B N=70	Total N=140
1.	NVD	36 (51.42%)	46(65.71%)	82(58.57%)
2.	Forceps	8 (11.43%)	6 (8.57%)	14(10.0%)
3.	Ventouse	4(5.71%)	4 (5.71%)	8(5.63%)
4.	LSCS	22 (31.43%)	14(20.0%)	36(25.71%)
Statistical inference		P value 0.35>0.05 (Not significant)		

Percentage of operative delivery was comparable in both the groups. We found that, out of 22 patients having a C-section in the early induction group, 8 were operated for fetal distress (36.3%), 7 cases (31.8%) for failed induction and 7 cases (31.8%) for NPOL (Non-progress of labour). Similarly, out of the 14 cases operated in the delayed induction group, 10 cases (71.4%) were for fetal distress, 3 (21.4%) were for failed induction and 1 (7.1%) was for non-progress of labour. However, the p value when only failed induction and non-progress of labour were compared in both groups; the difference came out to be **significant** (p value 0.04<0.05). The difference in the APGAR scores of the babies were comparable (p value-0.79>0.05).

The rate of maternal morbidities was found to be 12.85% in the early group and 22.85% in the delayed group in our study. 9 patients in the early induction group reported various maternal morbidities mostly fever (3 cases) and puerperal sepsis (3 cases). Other morbidities included 1 case each of PPH, chorioamnionitis, and manual removal of placenta. No cases of UTI, SSI, and LRTI were reported in the early induction group. In the delayed induction group, 5 patients reported fever and 2 cases had chorioamnionitis. Both the cases of chorioamnionitis failed to progress and were operated upon. They presented with foul smelling liquor during operation and had fever and mild distension of abdomen with raised total leukocyte count. All of them received injectable antibiotics for a longer period of time (7 days). There were 1 case each of lower respiratory tract infection (LRTI), urinary tract infection (UTI), post-partum haemorrhage (PPH) and surgical site infection (SSI). There were 2 cases of manual removal of placenta and 4 cases of puerperal sepsis in the delayed induction group.

Neonatal morbidity in the early induction group are as follows. 2 cases (2.85%) had neonatal jaundice who received phototherapy, 1 case (1.43%) of birth asphyxia and 1 case (1.43%) of RDS. In the delayed induction group, there were 3 cases reported of neonatal jaundice who received phototherapy and 1 case (1.43%) each of neonatal sepsis, LRTI and convulsion.

CONCLUSION

Difficulties are encountered with the diagnosis of PROM (when there is no active draining), recognition of its etiological factors and management. Complications associated with PROM increases with

decrease in gestation and increase in the duration of PROM. Pregnancies complicated by PROM needs supervision and monitoring preferably in an institution with a good NICU. Although early induction decreases the PROM to delivery interval significantly, delayed induction after a period of 12 hours following PROM at term, stands as a reasonable option and it decreases the number of LSCS/operative deliveries without compromising the maternal and foetal outcome. Therefore, a **team approach** directed at the early recognition of complications of PROM and its management and delivery; could alleviate the situation by reducing perinatal morbidity and mortality to a great extent.

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