

ORIGINAL RESEARCH

Induction of labour in preterm rupture of membranes (PROM) at or above 34 weeks gestation with its maternal and fetal outcome- A prospective analysis tertiary care centre

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ABSTRACT

The primary goal of the study is to evaluate the manner of delivery in cases of preterm membrane rupture caused by induction of labour. The secondary goal is to evaluate the maternal and foetal outcomes. From January 2018 to December 31, 2019, a prospective cohort of pregnant women admitted to the Department of Obstetrics and Gynecology at KIMS hospital over gestational age 34 weeks with PROM was studied. Compared to 68 percent in the Expectant Management group, 75 percent of women had normal vaginal deliveries. In the Immediate Delivery group, 25% of women experienced LSCS/instrumental delivery, compared to 31% in the Expectant Management group. The mode of delivery difference between the two groups was not statistically significant. Keywords: Preterm rupture of membranes, Induction of labour, foetal outcome, 34 weeks gestation

INTRODUCTION

Premature rupture of the foetal membranes (PROM) is defined as the rupture of the amniotic membranes with the leaking of amniotic fluid more than one hour before the commencement of labour. PROM is split into two types: term PROM (after 37 weeks of gestation) and preterm PROM (PPROM, i.e. PROM prior to 37 weeks of gestation). PPRM occurs in about 10% of pregnancies and is responsible for one-third of all premature births [1, 2, 3, 4]. There are high risks of infant morbidity and mortality following birth, especially when PROM occurs far from term. Because of the link between PROM and intrauterine infection, oligohydramnios, placental abruption, umbilical cord compression, and premature birth, the foetus is also at risk before birth, especially if conservative therapy is used to extend the pregnancy. When compared to an age-adjusted control group, PROM is linked with a fourfold increased risk of composite unfavourable outcomes such as mortality, BPD, severe neurological abnormalities, and serious retinopathy [7, 8]. Gestational age at delivery is the key driver of newborn morbidity and mortality, emphasising the significance of conservative care when possible. In general, the prognosis is good beyond 32 weeks of gestation if no other complicating factors occur, such as congenital malformations or pulmonary hypoplasia. It depicts a clinical setting in which early birth is to be expected due to the prevalence of prenatal and neonatal problems; thus, the obstetrician has an opportunity to intervene in a way that can enhance perinatal outcome. PROM is diagnosed using a mix of clinical

suspicion, patient history, and a few simple tests. When rupture of membranes (ROM) occurs at term, the majority of patients (90%) start spontaneous labour within 24 hours. The main question in managing these patients is whether to let them to go into labour naturally or to induce labour. The therapy of these individuals is mostly determined by their desires; nonetheless, the primary maternal concern at this gestational age is intrauterine infection. The duration of ROM raises the risk of intrauterine infection. Evidence suggests that induction of labour, rather than expectant management, reduces the risk of chorioamnionitis while raising the caesarean birth rate. The goal of this study is to assess the method of delivery in cases of preterm membrane rupture caused by labour induction.

MATERIALS AND METHODS

STUDY DESIGN

It is a prospective cohort study of pregnant women admitted to Department of Obstetrics and Gynaecology, KIMS hospital above gestational age 34 weeks with PROM from January 2018 to December 31 2019.

SETTING

Kalinga Institute of Medical Sciences, a tertiary care centre. Bhubaneswar.

DURATION OF STUDY

One year Recruitment status After IEC approval

INCLUSION CRITERIA

Patients who are at Gestational age at or above 34 weeks, leaking per vaginum to labour interval greater than 1hour, singleton pregnancy, and cephalic presentation have been included.

EXCLUSION CRITERIA

Patients with less than 34 weeks gestational age, leaking per vaginum to labour interval less than 1 hour, have multifetal gestation, malpresentations, congenital anomalies, IUFD, medical disorders complicating pregnancy, previous underwent caesarean section, improper history or no leaking on per speculum were excluded from this study.

CO-VARIABLES

The covariables in this study included maternal age, parity, mean gestational age, rupture to labour interval, mode of induction, corticosteroids/ antibiotics, and decision of induction to incision for caesarean interval.

COURSE IN HOSPITAL

A complete present clinical history, including previous obstetric history, will be collected upon enrollment. A detailed obstetric examination is performed, as well as a per speculum examination, to confirm the leakage of amniotic fluid, which is the study's confirmative test. A comprehensive general and systemic assessment will be performed. Routine antenatal investigations and testing for foetal well-being are performed using CTG and Ultrasonography with colour doppler in accordance with departmental guidelines. Evidence of fluid pooling in the vagina, or leaking from the cervical os when the patient coughs or when fundal pressure is applied, will help determine PROM. Diagnostic methods using nitrazine paper and determination of ferning have sensitivities approaching 90 percent. The normal vaginal pH is between 4.5 and 6.0, whereas amniotic fluid is more alkaline, with a pH of 7.1 to 7.3. Bacterial vaginosis can produce a similar result. A separate swab should be used to

obtain fluid from the posterior fornix or vaginal sidewalls, and that cervical mucus can result in a false-positive result if the external cervical os has been swabbed. Bishop's score is calculated based on clinical factors related to labour. The delivery is scheduled accordingly. When the Bishop's score is not favourable or no labour pains are established, a course of antibiotics and steroids is delivered until the steroid regime is complete with or without tocolytics. Following the completion of the steroid regimen, the case is followed by alternate day complete blood count testing, C reactive protein levels, and Fetal heart rate monitoring to rule out any chorioamnionitis.

In the event of multigravida, induction of labour is followed with prostaglandin E2 gel and inj Oxytocin IV infusion 2.5 to 5 units in the case of primigravida, respectively, in an ascending regimen. Each instance has its own partogram. In the event of a failed induction, a Caesarean section is performed.

RESULTS

Table 1: Neonatal demographic profile and outcome

Variables	Category	Mode of Delivery		Total	p-value
		LSCS	ND		
Age group	18-24	14 (19.0)	21 (31)	35	0.302
	25-35	60 (77.5)	45 (67.5)	105	
	>35	5 (6.1)	3 (1.45)	8	
Method of Induction	DG	10 (14.6)	5 (8.3)	15	0.092
	Oxy	31 (42)	40 (57.5)	71	
	Both	10 (14.6)	12 (19)	22	
	No	21 (28.3)	11 (14.9)	32	
APGAR Score	≥7	40 (54)	44 (63.1)	84	0.244
	<7	34 (46)	25 (36.1)	59	
Hypotonia	Yes	1 (2.5)	0 (0)	1	0.495
	No	73 (97.5)	70 (100)	143	
CF of Chorioamnionitis	Yes	2 (1.5)	2 (1.5)	4	0.732
	No	74 (98.5)	69 (98.4)	143	
Parity	Primi	33 (44)	36 (49.8)	69	0.692
	Multi	40 (54)	35 (50.6)	75	
Seizures	No	70 (94.3)	71 (99.2)	141	0.366
	Yes	3 (5.2)	2 (1.9)	5	
By Mother side	Yes	29 (39)	34 (49)	63	0.200
	No	45 (60)	34 (49)	79	
Ventilator	Yes	10 (14)	13 (17.4)	23	0.684
	No	64 (85)	60 (83)	124	
Jitterness	No	69 (90.2)	62 (88.5)	131	0.883
	Yes	9 (10)	9 (12.6)	18	
Apnoea	Yes	16 (20.5)	10 (11.5)	26	0.156
	No	60 (80)	64 (88.6)	124	

Association Complication	Yes	6 (6.12)	5 (5.8)	11	0.809
	No	70 (93.1)	68 (95)	138	

Table 1 reveals that a majority of the patients (105 patients) belonged to the age group of 25-35 which was followed by second highest number of patients (35 patients) in the 18-24 age group. A high score of method of induction was found in the Oxy group (71), APGAR score for ≥ 7 group (84), in group with absence of hypotonea (143), in group with absence of CF of chorioamnionitis (143) etc.

Table 2: Neonatal outcomes stratified by gestational age

Variable	Category	Gest. Age Group					p-value
		37	36	35	34	33	
APGAR SCORE	<7	10 (25.0)	11 (28.9)	14 (46.7)	19 (63.3)	7 (77.8)	0.000
	≥ 7	30 (75.0)	27 (71.1)	16 (53.3)	11 (36.7)	2 (22.2)	
SEIZURES	No	39 (97.5)	37 (97.4)	29 (96.7)	28 (93.3)	9 (100)	0.903
	Yes	1 (2.5)	1 (2.6)	1 (3.3)	2 (6.7)	0 (0)	
HYPOTONEA	No	40 (100)	37 (97.4)	30 (100)	29 (96.7)	9 (100)	0.635
	Yes	0 (0.0)	1 (2.6)	0 (0)	1 (3.3)	0 (0)	
JITTERNESS	No	35 (87.5)	32 (84.2)	28 (93.3)	28 (93.3)	8 (88.9)	0.730
	Yes	5 (12.5)	6 (15.8)	2 (6.7)	2 (6.7)	1 (11.1)	
APNOEA	No	38 (95.0)	33 (86.8)	26 (86.7)	22 (73.3)	5 (55.6)	0.017
	Yes	2 (5.0)	5 (13.2)	4 (13.3)	8 (26.7)	4 (44.4)	
VENTILATOR	No	38 (95.0)	33 (86.8)	25 (83.3)	20 (66.7)	8 (88.9)	0.032
	Yes	2 (5.0)	5 (13.2)	5 (16.7)	10 (33.3)	1 (11.1)	
BY OTHERSIDE	No	16 (40.0)	18 (47.4)	20 (66.7)	22 (73.3)	5 (62.5)	0.031
	Yes	24 (60.0)	20 (52.6)	10 (33.3)	8 (26.7)	3 (37.5)	

Table 2 reveals that the APGAR score was high among the patients with 34 gestational ages in the <7 group (14) while it was higher in the patients with 37 gestational age in the ≥ 7 group (30). It is also evident that hypotonia was high in 37 gestational age group (40), seizures were high in 37 gestational age group (40).

DISCUSSION

PROM is associated with increased maternal and new-born morbidity and mortality due to infection, umbilical cord compression, placental abruption, and preterm birth. Subclinical intrauterine infection has been identified as a significant etiological factor and subsequent increase in maternal and new-born morbidity [15, 16].

Our study examined 147 patients for eligibility with preterm prelabour rupture of membranes, and 39 patients were accepted into the experiment. Twenty patients were assigned to the Immediate Delivery arm, whereas 19 were assigned to the Expectant Management arm. Both groups had similar baseline characteristics. Ninety-three percent of patients in the Immediate Delivery arm and seventy-three percent of patients in the Expectant management arm were between the ages of 25 and 35, with the remainder being over the age of 35.

In the Immediate Delivery group, 75% of women had normal vaginal births, compared to 68% in the Expectant Management group. Twenty-five percent of women in the Immediate Delivery group had LSCS/instrumental delivery, compared to 31% in the Expectant Management group.

The difference in mode of delivery between the two groups was not statistically significant [17, 18]. Because our sample size was tiny, we must interpret our findings with caution. Larger studies, such as the PPRMOT trial, discovered a considerably greater rate of LSCS in

the Immediate Delivery arm than the Expectant Management arm (p-value 0.0001). Other studies (PROMEXIL and TERMPROM) did not show this difference.

Both groups had the same level of hypoglycemia. There were two babies in the Immediate Delivery group and none in the Expectant Management group who had hyperbilirubinemia. In the PPROMEXIL research, the Immediate Delivery arm had a statistically significant higher rate of both of these problems than the Expectant Management arm [19].

One significant limitation of our study is that we were unable to secure a larger sample size. This was primarily attributable to patients being eliminated because of increased CRP and WBC counts. Other similar trials, such as PPROMEXIL and PPROMT, did not employ precise CRP and count cut offs for removing patients from recruitment, however we did, based on our hospital policy. We selected CRP cut offs of 5mg/L and 15,000 cells/mm³ for C-RP and WBC counts, respectively.

According to Van der Laar et al (20), the five studies included in the meta-analysis employed cut offs ranging from >12mg/L to >40mg/L. Sensitivities for clinical chorioamnionitis and histological chorioamnionitis were reported to be 100 percent and 88 percent, respectively. Clinical chorioamnionitis specificities ranged from 55% at a cut off of 20 mg/L to 98.5% at a cut off of >20mg/L [21]. Specificity for histological chorioamnionitis ranged from 68 percent at a cut off of >20mg/L to 100 percent when this was increased to 40mg/L.

CONCLUSION

In carefully selected patients, the risk of Neonatal Sepsis does not increase with Expectant Management up to 37 weeks compared to Immediate Delivery in pregnant women presenting with Preterm Prelabour Rupture of Membranes between 34 and 36+6 weeks. Immediate Delivery or Expectant Management had little effect on maternal morbidity or death. The mode of delivery is the same for both lines of management. Immediate delivery may result in a higher rate of admission to the Neonatal ICU, more morbidity for the baby, more hospital costs, and emotional worry for the parents. The impact of both treatment modalities on long-term neurodevelopmental outcomes of neonates will necessitate a bigger sample size study with long-term follow-up of infants up to 5 years of age. In women with pre labor rupture of the membranes at term, induction of labor with oxytocin or prostaglandin E2 and expectant management result in similar rates of neonatal infection and caesarean section. Induction of labor with intravenous oxytocin results in a lower risk of maternal infection than does expectant management. Women view induction of labor more positively than expectant management. Prolonging pregnancy after documentation of pulmonary maturity unnecessarily increases the likelihood of maternal amnionitis, umbilical cord compression, prolonged hospitalization, and neonatal infection

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