Premature rupture of membranes at term: Early induction versus expectant management

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Abstract

Introduction: Premature rupture of the membranes at term is spontaneous rupture of the membranes after 37 wks of the gestations and before the onset of the regular painful uterine contractions. It occurs in ten percent of cases and managed either expectantly or actively.

Objective: The present research was undertaken to study the effectiveness of early labor induction and to assess maternal and fetal outcome in term pregnancy with cervical PGE2 versus expectant management.

Materials and Methods: This was a randomised control trial conducted in the Department of Obstetrics and Gynaecology from October 2014 to September 2016 on a sample size of 144. They were divided into two groups – Group A containing subjects with expectant management and Group B with subjects who were induced with intracervical PGE2 and their outcome was compared.

Results: In group A, 70.83% of cases spontaneous labours started within 24 hrs and in those with induction 56.94% were successful. Of the spontaneously delivered 65.28% were primi with 58.33% having favourable Bishop Score. In those with induction 73.61% were primi with 56.94% having favourable Bishop Score.

Conclusion: Early induction of labour in cases of PROM at term with PGE-2 GEL resulted in reduction of latency of labour but also increased operative intervention. Expectant line has greater maternal and neonatal morbidity.

Keywords: Amniotic fluid, Expectant management, Intracervical PGE2**,** Premature rupture of membrane, Term pregnancy.

Introduction

Premature rupture of membranes (PROM) refers to the loss of integrity of membranes before onset of labour with resulting leakage of amniotic fluid and establishment of communication between the amniotic cavity and endocervical canal and vagina.[1] Rupture of membranes occurs beyond 37 weeks it is called term PROM and when it occurs before 37 completed weeks it is called preterm PROM. PROM occurs due to smoking, vitamin C deficiency, amniocentesis, and infections. It occurs in approximately 5-10% of all pregnancies of which 80% occur at term.[2]

The management of PROM at term remains a matter of great debate till date. Accurate prediction of maternal chorioamnionitis and early-onset neonatal infection (EONI) remains a critical challenge and is associated with increased neonatal morbidity and mortality.[3] While induction of labour has resulted in decreased incidence of maternal and fetal sepsis, but it is also associated with a higher incidence of caesarean section rate due to fetal distress and uterine hyperstimulation. Approximately 60–70 % of term PROM cases are followed by the onset of labor within 24h and an additional 20–30% will start within 72 h.[1,4] Prostaglandins- PGE2 and PGE1 have been used for cervical ripening and myometrial stimulation in unfavorable cervices with low Bishop's pre- induction score. It is seen that in patients who had expectant management, with prolonged hospitalization without active intervention with uncertain fetal and neonatal prognosis, many a times leads to maternal psychological sequalae.[5]

In view of this, a randomized controlled study was done with the following objectives. 1) To study the effectiveness of early labour induction with cervical PGE2 versus expectant management in women with term PROM, 2) To compare maternal and fetal outcome in term PROM with early induction of labour with cervical PGE2 versus expectant management.

Material and Methods

After obtaining Institutional Ethical Committee approval and written inform consent from all the patients, this randomised control trial was carried out in total 144 cases, who attending Obstetrics and Gynaecology OPD / IPD at tertiary care hospital from October 2014 to September 2016. The study included all pregnant women having term singleton pregnancy with cephalic presentation with PROM of less than 6 hrs and cervical dilatation less than 3 cm. The patients with features of chorioamnionitis, PROM before 37 completed weeks, meconium stained amniotic fluid, medical or obstetric complications indicating prompt delivery, multiple pregnancies at the time of admission were excluded from the study.

A detailed history was noted as per study proforma and thorough, general and systemic examination was done. A detailed abdominal and obstetric examination was done to note presentation, uterine contraction status, and fetal heart rate pattern. Premature rupture of membrane (PROM) was confirmed by per speculum

examination of vagina and sterile pads in doubtful cases. Routine and specific investigations were done including USG obstetrics, if required. Cervical swab was sent for culture and sensitivity. Cervical effacement, dilatation, presence / absence of membrane were noted by per vaginal examination. The study patients were randomly allocated in two groups of 72 patients in each group, using computer generated tables. Group A - Expectant management for 24 hrs and Group B – Early induction group with PROM less than 6 hours by intracervical PGE2 gel. Group A was subdivided into A1 group where spontaneous labor started within 24 hours of expectant management and A2 group where induction was required after 24 hours. Similarly, group B was subdivided into B1 group where induction was successful and group B2 where reinduction was required after 6 hours by oxytocin or prostaglandin.

All the patients received antibiotics by parenteral route till delivery. Group A was monitored for uterine contractions and fetal heart activity for 24 h. Similarly, group B was monitored for uterine contractions and fetal heart activity following induction till delivery. Pervaginal examination was done to confirm labor progress or induction failure after 6 h of induction. Reinduction was done after 10 h of initial induction in cases of induction failure. Emergency LSCS were performed for fetal distress, nonprogress of labor, and failure of induction with/without chorioamnionitis. In puerperium, all patients were followed clinically and investigated for evidence of infection. Clinical parameters considered for maternal morbidity were fever, tachycardia, abdominal tenderness, foul smelling lochia, subinvolution of uterus, and evaluation of stich line. Laboratory parameters such as complete blood count, urine culture and sensitivity, and cervical swab culture and sensitivity were done. Change of antibiotic was effected whenever required depending on culture and sensitivity report. Neonatal morbidity was considered in cases of neonatal septicemia, convulsions, or with birth asphyxia.

Results

Out of the 144 cases of PROM studied, 72 cases were induced with intracervical PGE2 gel and 72 cases were kept on expectant line of management. Most of the cases were in the age group of 20-25 years. The mean age of patients in group A was 24.3±3.22 years and in group B was 23.8±3.70 years. Average gestational ages in weeks were same for both the groups' i.e. Expectant group 38.9±0.99 weeks and Induction Group 38.9±0.89 weeks. The majority of cases (69.44%) were primigravida shown in table 1.

Table 1: Distribution of patients according to parity

Parity	Group A		Group B		Total	
	Number	%	Number	%	Number	%
Primigravida	47	65.28	53	73.61	100	69.44
Multigravida	25	34.72	19	26.38	44	30.55
Total	72	100	72	100	144	100

The mean PV leaking time was longer in expectant group for primigravida as well as for multigravida than in induction group. Vaginal delivery occurred in 55.55% patients in induction group and 79.17% in expectant group. Of the spontaneously delivered 65.28% were primi with 58.33% having favourable Bishop Score. In those with induction 73.61% were primi with 56.94% having favourable Bishop Score (Table 2).

Table 2: Distribution of cases according to type of delivery

Type of Delivery		Group A		Group B	
		Number	%	Number	%
Vaginal		57	79.17	40	55.55
LSCS		15	20.83	31	43.06
Instrumental		0	0	1	1.39
Bishop score on admission	Favourable	42	58.33	41	56.94
	Unfavourable	30	41.67	31	43.06

In group A, 70.83% of cases spontaneous labours started within 24 hrs and in those with induction 56.94% were successful (Table 3).

Table 3: PROM- delivery interval (PDI)

Time	Group A		Group B	
	Number	%	Number	%
<6 hours	7	9.72	23	31.94
7-12 hours	51	70.83	41	56.94

13-24 hours	9	12.5	5	6.94
>24 hours	5	6.94	3	4.16

Table 4 show the maternal outcome and table 5 show foetal outcome in early induction and expectant management group. Mean NICU admission in group A and group B was 6.94±21.30 and 4.16±43.52 respectively. The requirement of antibiotic was more in expectant group (5.56+47.22) as compared to induced group (1.39±23.61).

Table 4: Maternal outcome

Outcomes	Group A		Group B	
	Number	%	Number	%
Nausea, Vomiting, Diarrhoea	0	0	3	4.16
Fever	4	5.55	2	2.77
postpartum hemorrhage (PPH)	5	6.94	6	8.33
Sepsis	4	5.55	3	4.16
Chorioamnionitis	4	5.55	1	1.38
Nil	55	76.38	57	79.16

Table 5: Neonatal outcome

Outcomes	Group A		Group B	
	Number	%	Number	%
Birth asphyxia	16	22.22	7	4.16
Mild APGAR <7	10	13.88	6	8.33
Severe APGAR <5	5	6.94	2	2.77
Sepsis	2	2.77	0	0.0
Stillbirth /early neonatal death	0	0.0	0	0.0
Nil	51	70.83	61	84.72

Discussion

PROM at term is a benign condition with approximately 80-90% of women entering labour spontaneously within 24-48 hours without medical intervention,[6-9] for such women prognosis is excellent and the premature amniorhexis can be considered physiological.[10,11] Unfortunately 5-10% women will not enter labour spontaneously and 2-5% remains undelivered 7 days following PROM at term. As the interval between membrane rupture and labour increases beyond 24 hours, chances of chorioamnionitis and perinatal mortality increases. Why some women enter labour shortly after membrane rupture while others have an extended latent period is unclear. For the subgroup of women who experience a short latency period, membrane rupture probably occurs as a result of the cascade of events associated with the initial stages of parturition.

In our study, both the groups (expectant management and Induced group) were comparable with respect to mean maternal age, gestational age, educational status, socio-economic background, urban-rural distribution. Since their socio-demographic profile was similar, therefore, any difference in outcome in these two groups was primarily due to different management protocols and not due to demographic differences.

In expectant group higher rate of vaginal delivery was found while in induction group rate of LSCS was higher, this was correlated with the previous studies.[12,13] Maximum LSCS were done for fetal distress followed by failure of induction. Majority of cases took 7-12 hours time to active labour followed by cases who took less than 6 hours time to active labour. The PROM to labour time was reduced in induction group than in expectant group. APGAR score and Bishop Score was comparable between two groups.

Maternal complications like Nausea, Vomiting, Diarrhea were more in Induction group (i.e. 3) as compared to Expectant (i.e. 0) group. We observed intrapartum pyrexia in 5.55% of expectant group versus 2.77 % in Induced group; this was compared with study of Suneela et al[12] and Sumaira et al [13]. PPH occurred in 6.94% in group A and 8.33% in group-B, whereas Suneela et al[12] reported 6.7% PPH in expectant group and 10% in induced group. This result may be because of the fact that- induction of labor has a higher incidence of PPH.[12,15] Puerperal Sepsis was seen in four cases of expectant group as compared to three in induction group. There was significant reduction in morbidity due to chorioamnionitis in early induction group. Mothers who did develop chorioamnionitis had abdominal tenderness in expectant group and abdominal tenderness and tachycardia in induction group. Incidence of chorioamnionitis was higher in expectant group. The expectant group also had statistically higher rate of wound complications and longer hospital stay.

Low APGAR score in first minute was noted in 8% of neonates in induction group and in 12% of neonates

in the expectant group. These incidences were in agreement with the other studies.[16-18] 22.22% babies in group A suffered from birth asphyxia (severe-6.94% and mild- 13.88%) as compared to 15.27% in group- B (mild- 8.33% and severe 2.77%). Neonatal Sepsis was more in expectant group (i.e. 2) as compared to induction group (i.e. 0). This may be attributed to the fact that there was a prolonged - delivery interval in group A (expectant group). There were no stillbirths or early neonatal deaths in either group.

Conclusions

We concluded that with early induction of labour using PGE-2 GEL in patients with PROM at term, the latency of labour and PROM delivery interval was reduced along with better maternal satisfaction and feto maternal outcome. Early induction of labour in cases of PROM at term using PGE-2 GEL also resulted in increased operative intervention. The expectant group who underwent conservative management had higher maternal and fetal morbidity, sepsis, longer hospital and NICU stay causing anxiety and distress to both patients and clinicians. Therefore, in all patients presenting with premature rupture of membranes at term should be actively managed with induction of labour after assessing the cervical condition according to the Bishop's pre- Induction score so as to reduce the incidence of maternal and fetal sepsis and morbidity.

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