

Premature Rupture of Membranes at Term: Immediate Induction With PGE₂ Gel Compared With Delayed Induction With Oxytocin

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Received: 13 November 2009 / Accepted: 21 June 2011 / Published online: 16 November 2011
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Abstract

Objectives To compare the effectiveness, safety of immediate induction with PGE₂ gel and expectant management in terms of maternal and fetal outcome in term PROM.

Methods 100 women were randomized to group A, immediate induction and group B expectant management.

Results Spontaneous vaginal deliveries were more in group B. CS and operative vaginal deliveries were more in group A.

Conclusion Expectant management followed by delayed induction with oxytocin is better than immediate induction with PGE₂ gel in term PROM. A good number of women go into spontaneous labor and deliver vaginally with out increase in the Cesarean section rate and infectious morbidity for mother and fetus.

Keywords PROM · PGE₂ gel · Oxytocin · Immediate induction · Expectant management

Introduction

Prelabor rupture of membrane is a common and important event in obstetrics. It has a major impact on fetal and maternal outcome, complicating the pregnancy leading to

maternal complications, increased operative interference, neonatal morbidity and in some cases, mortality.

With intact membranes, the fetus enjoys a large measure of isolation and protection from microorganisms of its surrounding environment and hence the possible etiological factors need to be evaluated which deprive the fetus of its benefit. The key to the management depends on the accurate assessment of gestational age, likelihood of infection, duration of latent period and the availability of NICU facilities.

There is a general agreement that the term and near term pregnant patients with PROM should be delivered to avoid infection to both mother and the infant as the dangers of infection goes on increasing with prolonged latent period. But early interference may increase the incidence of cesarean section.

The present study is undertaken to compare the safety and effectiveness of immediate induction with PGE₂ gel and expectant management followed by delayed induction with oxytocin in term PROM in cases admitted, to Bapuji Hospital, Chigateri General Hospital, Women and Child Hospital, attached to JJMMC Davangere.

Method

This is a prospective study conducted in the hospitals attached to J. J. M. Medical College (Bapuji Hospital, Chigateri General Hospital, Women and Child Hospital) from September 2006 to May 2008. Diagnosis of PROM was based on clinical history of passage of liquor,

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speculum examination of fluid in the posterior fornix and confirmation by fern pooling method. After diagnosing PROM, FHS was monitored and abdomen palpated for uterine contractions. Bishop scoring was done. Women were then randomly allotted to either immediate induction group or expectant management group. Prophylactic antibiotic of 3rd generation cephalosporins group was given (inj. Taxim 1 gm stat) and women in expectant management group were immediately observed for 12 h, avoiding digital examination. Monitoring included temperature every 4th hourly, Pulse Rate every hourly, uterine tenderness, FHS hourly by auscultation.

Procedure of Study

This is a prospective study of 100 cases of singleton pregnancies with term PROM, 50 were managed with immediate induction and 50 conservatively. For women in the immediate induction group, labor was immediately induced by instillation of 0.5 mg PGE₂ gel in the posterior fornix. They were kept under observation. If labor has not supervened after 6 h, or no increase in Bishop score, then application of PGE₂ gel was repeated. Vaginal examination repeated every 6 h and progress noted with Bishop score.

At the end of 12 h, if the women has still not set into labor it was labeled as failed induction. But if bishop score was found to have changed by ≥ 2 and if indicated, oxytocin drip was started.

In case of hyper stimulation of uterus, uterine tachysystole, hypertonus, left lateral position was given, O₂ administered and RL started. If still it persisted, then injection terbutalin subcutaneous was given and women withdrawn from the study and a quick delivery achieved by cesarean delivery.

If labor did not supervene in 12 h since admission, induction of labor with oxytocin infusion was done with 5 U syntocin in 500 ml of RL with infusion rate of 2 mlU/min. Infusion of syntocin doubled every 20 min until 3 contractions in 10 min lasting for 45–60 s were obtained or until a maximum infusion rate of 32 mlU/min was achieved. Vaginal examination was done every 4 h to assess the progress of labor.

Results

A total of 100 patients were recruited in this trial and were divided into 2 groups group A and group B randomly. Group A had 50 patients who were assigned to immediate induction group (induced with PGE₂ gel) and group B had 50 patients who were assigned to expectant management group. As shown in Table 1, 30 improved their Bishop

score when PGE₂ gel applied once and 3 improved after two applications. Among the 30 patients in group B who were not induced, 25 of the patients Bishop score improved in 12 h. Among 20 patients induced with oxytocin after 12 h 15 improved the Bishop score. As shown in Table 2 among the immediate induction group 47 were induced with PGE₂ gel only. Repeat induction was needed only in 3 women. 28 women needed oxytocin during labor for acceleration. Among the expectant management group 20 were induced with oxytocin only. 30 did not need induction with oxytocin as they set into labor during the expectant period and 41 needed oxytocin during labor for acceleration. As in Table 3 the mean time taken in hours from induction to 3 cm dilation in group A was 7.5 ± 4.7 and in group B was 3.3 ± 1.5 $P = 0.001$ statistically not significant. Induction to delivery was $12.7 + 6.2$ in group A and 7.8 ± 1.7 in group B which is statistically significant i.e. induction to delivery interval is prolonged in group A. The mean interval from ROM to delivery was 13.7 ± 6.2 in group A and 18.7 ± 8.5 in group B. $P \leq 0.001$. This was statistically significant. Fetal distress was more in group A, 14, as compared to group B where it was 8 as given in Table 4. Among the 14 in group A 13 were taken for LSCS and 1 was delivered by vacuum. Among 8 in group B 5 were taken for LSCS, 2 delivered by outlet forceps and 1 by vacuum. Even though fetal distress more in group A it was not statistically significant. Neonatal out come in group A and group B is given in Table 5. The Apgar score of <7 at 5 min were seen in 2 neonates in both group A and group B and therefore not significant.

Discussion

Recent studies show that the expectant management is safe and more successful in achieving vaginal delivery. In the study conducted by Smith [1] PGE₂ gel was found to improve the Bishop score. In a study conducted by Chyu [2] PGE₂ was effective in achieving cervical ripening and the use of oxytocin was less frequent. In the present study 94% needed only single application and only three required repeat PGE₂ application. This was comparable to the study conducted by Snehamay [3] where 91.89% of women required only a single application of PGE₂ gel for induction. In the present study 60% went into spontaneous labor as compared to 32.14% in the study conducted by Snehamay. In the present study induction to the delivery interval was prolonged in immediate induction group. However, study conducted by Stewart [4] PGE₂ gel immediate oxytocin regimen resulted in shorter induction delivery interval without adverse outcomes. The rate of CS in immediate induction group was 17.8% in the study by Snehamay, and 40% in the present study. In expectant management group the rate of CS

Table 1 Bishop score at the time of admission

Characteristic	Gp A	Gp B	χ^2	<i>P</i>
Bishop score ≥ 6	9 (18%)	14 (28%)	1.41	0.24
<6	41 (82%)	36 (72%)	–	–
Presence of Gp B streptococcus in vaginal culture	2 (4%)	–	–	–

Chi Square test used here

Table 2 Induction of labor

	Immediate induction <i>n</i> = 50	Expectant management gp <i>n</i> = 5–	<i>Z</i>	<i>P</i>
PGE ₂ gel once	47 (94%)	–		
Oxytocin only	–	20 (40%)		
Repeat PGE ₂	3 (6%)	–		
Not induced	–	30 (60%)		
Use of oxytocin during labor for acceleration	28 (56%)	41 (82%)	2.93	<0.01

Table 3 Maternal outcome

Out come measures(h)	Gp A Mean \pm SD	Gp B Mean \pm SD	<i>Z</i> value	<i>P</i> value
Time taken from induction to 3 cm dilatation	7.5 \pm 4.7	3.3 \pm 1.5	6.02	<0.01
Duration of active labor	5.5 \pm 1.4	5.2 \pm 1.7	0.96	0.34
Induction to delivery interval	12.7 \pm 6.2	7.8 \pm 1.7	3.29	<0.01
Interval form ROM to delivery	14.7 \pm 6.2	18.7 \pm 8.5	2.69	<0.01
Hospital stay before delivery	13.0 \pm 6.2	12.5 \pm 7.3	0.37	

was 28.5% in Snehamay group and 27% in the present study. Operative vaginal deliveries were significantly higher 14.2% in expectant management group compared to immediate induction group of 3.5% in the study of Snehamay. But in the present study operative vaginal deliveries were more in the immediate induction group compared to delayed induction group. A study conducted by George [5] concluded that an expectant management of 12 h will allow a good number of women to go into labor spontaneously without an increase in CS rate. A study conducted by Shalev [6] also concluded that regimens of 12 and 72 h expectant management of PROM are comparable regarding infectious complications and pregnancy outcomes. In the present study the infectious morbidity in the mother was same in either group. Fetal distress was more in immediate induction group. In the present study but similar in both groups in other study.

Table 4 Fetal distress

	Gp A	Gp B	<i>Z</i>	<i>P</i>
Fetal distress	14 (28%)	8 (16%)	1.46	0.14
Clinical chorioamnionitis	0	0	–	–
Analgesic used	31 (62%)	30 (60%)	0.21	0.83
Postpartum fever	2 (4%)	1 (2%)	0.59	0.55

Table 5 Neonatal out come

Outcome measures	Gp A	Gp B	<i>Z</i>	<i>P</i>
Apgar score <7 at 1 min	48 (96%)	44 (88%)	1.49	1.14
<7 at 5 min	2 (4%)	2 (4%)	0.00	1.00
Resuscitation with O ₂	10 (20%)	7 (14%)	0.8	0.42
Ventilation after initial resuscitation	3 (6%)	4 (8%)	0.39	0.70
Stay in NICU	3 (6%)	4 (8%)	0.39	0.70
Feeding problems at 48 h of age	3 (6%)	4 (8%)	0.39	0.70
Neonatal infection	2 (4%)	2 (4%)	0.00	1.00

Conclusion

An expectant management followed by delayed induction with oxytocin will allow a good number of women to go into labor without an increase in CS rate and infectious morbidity for mother and fetus as per the present study and therefore expectant management will decrease the incidence of CS as compared to early induction with PGE₂ gel. Early induction increases the incidence of operative vaginal deliveries. Therefore expectant management is better than immediate induction in term PROM patients.

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