
OBSTETRICS

Prostaglandin E₂ Vaginal Suppository for Induction of Labour in Favourable and Unfavourable Cervix

Nimit Taechakraichana MD,
Unnop Jaisamrarn MD,
Yuen Tannirandorn MD,
Prasert Trivijitsilp MD,
Wichai Termrungruanglert MD.

Department of Obstetrics and Gynaecology, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand

ABSTRACT

Objective To compare the pregnancy outcome between patients with favourable and unfavourable cervix.

Design Prospective study.

Setting Department of Obstetrics and Gynaecology, Faculty of Medicine, Chulalongkorn University Hospital.

Subjects Twenty-seven, term, pregnant women were admitted for induction of labour with prostaglandin E₂ (PGE₂) vaginal suppository (3 mg).

Main outcome measures Mode of delivery, time from initial application of PGE₂ until delivery, any adverse effects, Apgar score and immediate newborn status.

Results Caesarean section was performed in 3 out of 13 and 3 out of 14 in patients with favourable (group 1) and unfavourable cervix (group 2) respectively. The mean time of application of prostaglandins to labour (A-L), application to delivery (A-D) and rupture of membranes to delivery (R-D) in cases of successful vaginal delivery, showed no statistical difference between the two groups (group 1 vs group 2, A-L 9.77 ± 7.39 hr vs 12.07 ± 9.02 hr ; A-D 19.45 ± 10.26 hr vs 20.87 ± 8.21 hr and R-D 5.65 ± 5.70 hr vs 6.24 ± 6.82 hr, P > 0.05, respectively). No adverse effects occurred both the baby and the mother during the labour period.

Conclusion The pregnancy outcome of induction of labour by PGE₂ vaginal suppository were similar between patients with favourable and unfavourable cervix.

Key words : prostaglandin E₂ vaginal suppository, induction of labour

Medical control of labour is often necessary in modern obstetrics. The status of the cervix may dictate the method of induction and influence its success.⁽¹⁾ Amniotomy and intravenous oxytocin has been used as a standard method for induction of labour in some institutes.⁽²⁾ However, patients with unfavourable cervix are likely to have prolonged labour with all inevitable sequelae.⁽³⁾ Locally applied prostaglandin E₂ has been widely used, not only to ripen the cervix but also to induce labour.⁽⁴⁾ Many studies have proved it to be simple, safe and highly acceptable to patients and obstetricians, particularly in cases in which a simple amniotomy could not be accomplished.^(2,5,6) Nevertheless, the question remains as to what is the pregnancy outcome in different cervical status? To compare the results between patients with favourable and unfavourable cervical score, we analysed the following prospective study.

Materials and Methods

This prospective study was carried out at the Department of Obstetrics and Gynaecology, Chulalongkorn University Hospital. Following the approval by our Institutional Review Board, twenty seven women were admitted for induction of labour receiving 3 mg of prostaglandin E₂ (PGE₂) vaginal suppository (Prostin E₂, Upjohn). Inclusion criteria before informed consent were singleton pregnancy, vertex presentation, intact membranes, reactive nonstress test and no evidence of fetal distress. Patients with abnormal lie or presentation, premature rupture of membranes, oligohydramnios, previous uterine scars, uterine contraction, history of allergy to prostaglandins or severe medical diseases such as asthma, heart diseases were excluded from the study. The gestational age

was estimated by confirmed last menstrual period during early antenatal care or ultrasonic findings that were compatible with the patients' menstrual dates. All procedures were performed in the labour room. Each patient was checked for cervical score and monitored over a period of 30 minutes to ensure that the fetal heart rates (FHR) were normal and there were few or no uterine contractions (fewer than three in 30 minutes). After an evaluation period, 3 mg of PGE₂ vaginal suppository was placed in the posterior fornix. Then, the patients were asked to remain in prone position for at least 1 hour. In the first 2 hours, the patients were closely monitored for abnormal FHR and uterine hyperstimulation. The Bishop score of 5 or less was considered unfavourable and more than 5 favourable. The cervical score was assessed by the same obstetrician until delivery. After the first 2 hours, the patients received standard Chulalongkorn labour care. Amniotomy was performed when cervical dilatation reached 3-4 cm and other conditions for amniotomy were fulfilled, unless membranes rupture spontaneously. Augmentation with oxytocin was done as indicated, using arithmetic-progression method. Route and method of delivery was performed under obstetric indication.

The following indices are used to measure the outcome : time from initial application of prostaglandins until delivery, incidence of uterine hyperstimulation, or other adverse effects, mode of delivery, Apgar score and immediate newborn status. Averaged data were reported as means and standard deviations and compared by unpaired t-test. $P < 0.05$ was considered significant.

Results

The patients' characteristics of the two

Table 1. Patients' characteristics

	Group 1 (N = 13)	Group 2 (N = 14)	P-value
Mother			
- Age (y)	23.85 ± 3.63	26.79 ± 5.45	0.11
- Partiy	0.15 ± 0.38	0.64 ± 0.93	0.09
- Gestational age (wk)	39.85 ± 1.57	39.93 ± 1.94	0.90
- Initial Bishop score	6.69 ± 0.86	4.29 ± 0.91	0.0001*
Newborn			
- Birthweight (g)	3,084 ± 385	3,022 ± 423	0.69

Group 1 = Patients with favourable cervix

Group 2 = Patients with unfavourable cervix

y = year, wk = week, g = gram

Table 2. Indications for induction of labour

	Group 1 (N = 13)	Group 2 (N = 14)
1. PIH	4	4
2. Postterm	2	5
3. Poor weight gain	1	1
4. Fetal anomalies*	1	1
5. Others**	5	3

PIH = Pregnancy induced hypertension

* Anencephaly, Hydrocephalus

** Thalassemia, Haemoglobinopathy, Systemic lupus erythematosus, decreased fetal movement

groups were similar (Table 1), except for the initial Bishop score. The indications for induction of labour in both groups are seen in Table 2.

The pregnancy outcomes between patients with favourable and unfavourable cervix are demonstrated in Table 3.

Considering only the cases of successful vaginal delivery in each group which also had similar patients' characteristics, we found that the mean time-interval from application of prostaglandin E₂ vaginal suppository to delivery (A-D), application to labour (A-L) rupture of mem-

Table 3. Pregnancy outcome

	Group 1 (N = 13)	Group 2 (N = 14)
Mother		
1. Route of delivery		
- Abdominal	3 @	3 #
- Vaginal	10 (76.9%)	11 (78.6%)
- NL	6	6
- F/E or V/E	4	5
2. Augmentation with Oxytocin	7	5
3. Analgesic given	11	10
4. Postpartum complication	0	1 *
Newborn		
1. Sex (Male : Female)	5 : 8	8 : 6
2. Birthweight (g)	3,084 ± 385	3,022 ± 423
3. Apgar score (At 1 min <7)	1	1 **
4. Neonatal jaundice	2	2

@ Fetal distress due to tetanic uterine contraction from oxytocin (1), Failure to progress (1), Cephalopelvic disproportion (1)

Failure to progress (2), Cephalopelvic disproportion (1)

* Severe preeclampsia

** Stillbirth (hydrocephalus)

NL = Normal labour and delivery, F/E = Forceps extraction,

V/E = Vacuum extraction

Table 4. Mean time from application of prostaglandin E₂ vaginal suppository to delivery, in cases of successful vaginal delivery

Time in hours	Group 1 (N = 10)	Group 2 (N = 10)*	P-value
1. Application to labour	9.77 ± 7.39	12.07 ± 9.02	0.54
2. Application to delivery	19.45 ± 10.26	20.87 ± 8.21	0.74
3. Rupture of membranes to delivery	5.65 ± 5.70	6.24 ± 6.82	0.84

* Not included one case of hydrocephalus

branes to delivery (R-D) between the two groups were not statistically significant (Table 4).

Discussion

The state of cervix is an important predictor of success in the induction of labour. A firm and rigid (unripen) cervix increases the likelihood of failed induction or prolonged, exhausting labour.⁽⁷⁾ In 1987, the guidelines of the American College of Obstetricians and Gynecologists state that a cervical score of at least six is considered favourable and is more likely to result in a successful labour induction.⁽⁸⁾ However, while the process of natural cervical ripening predicts a successful labour induction, the effects of iatrogenic ripening are less well defined and remain under clinical investigation.⁽⁹⁾

Prostaglandin E₂ vaginal suppository has been shown to be simple, successful and a safe approach to induce labour, particularly in cases of high Bishop score.⁽¹⁰⁻¹²⁾ Nevertheless, there are still variety of opinions and results when using prostaglandins for induction of labour in the unripened cervix. Some studies found it was not so impressive,^(1,9) but others revealed satisfactory outcomes.^(5,13,14)

In the present study, we used prostaglandin vaginal suppository for induction of labour, comparing between patients with favourable and unfavourable cervix. The pregnancy outcome particularly, the percentage of vaginal delivery between the two groups was quite similar, as shown in Table 3. However, in vaginal deliveries although the application to labour time, application to delivery time, and ruptured membranes to delivery time were shorter in patients with favourable cervix, the difference was not significant statistically. A

larger controlled clinical study is needed to confirm or refuse this finding.

Acknowledgement

This study was financially supported by a research grant from Rachadapiseksomphot Fund, Faculty of Medicine, Chulalongkorn University. We are grateful for the assistance provided by residents of the Department of Obstetrics and Gynaecology, Chulalongkorn Hospital in taking care of the patients and also for data collection. Finally, we would like to thank Mrs. Montatip Jetaporn for preparing this manuscript and most of all to the dedicated patients in this study.

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