

PG E2 GEL SUPPLEMENTED WITH ORAL PG E2 FOR INDUCTION OF LABOUR IN HIGH RISK PREGNANCY

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ABSTRACT

INTRODUCTION: The risks to the fetus-infant increase substantively in high risk pregnancies. The efforts are always to ensure a vaginal rather than a caesarian delivery. The present study aims to assess the safety and efficacy of Prostaglandin E2 (PGE2) intracervical gel and oral PGE2 in inducing and augmenting labour in such patients.

METHODS: PGE2 intracervical gel was used for induction of labour in 100 high risk pregnancies. PGE2 gel was supplemented by oral PGE2 after ARM.

RESULTS: PGE2 successfully induced labour in 60% of women while it improved the Bishop's score in the rest of the cases. L.S.C.S. was needed in only 7% of women.

CONCLUSION: Intracervical PGE2 gel application is a safe and efficacious method of inducing labour, which can be augmented with oral PGE2 when needed.

KEYWORDS: Prostaglandin E2 gel, Oral PGE2, High risk pregnancy, Induction of labour.

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INTRODUCTION

Elective induction of labour in high risk pregnancies is always desired to ensure satisfactory perinatal outcome.¹ The cervix is often unfavourable in these cases at the time of induction and this presents a great challenge in the successful induction of labour.^{2,5} Recently prostaglandins have revolutionised the labour induction techniques, especially in those patients with unfavourable cervical conditions. Efforts are still on to find the best route for its administration and the role of PGE2 in augmentation of labour.⁶ The present study was undertaken to investigate:

- 1) Effectivity of cervical application of PGE2 gel as an inducing agent .
- 2) Role of oral PGE2 as an augmenting agent after priming the cervix with PGE2 gel.

MATERIAL AND METHOD

One hundred pregnant women with one or more high risk factors were selected from the admitted patients for induction of labour at Nepalgunj Medical College Teaching Hospital Kohalpur between June 2010 and December 2011. The criteria for selection of cases were:

- 1) Gestational age > 36 weeks with cephalic presentation and intact membranes.
- 2) Parity between 0 4
- 3) Singleton pregnancy

Exclusion criteria:

- 1) Previous uterine and / or urinary bladder surgery.
- 2) Placenta previa in current pregnancy.
- 3) Intra uterine fetal demise.
- 4) Hypersensitivity to prostaglandins.

Gel application:

After detailed ultrasonic examination, informed consent was taken. Bishop's score was determined and pelvic assessment was done. When the pelvis was found to be adequate, 0.5 mg PGE2 in 2.5 ml of gel was instilled in the cervical canal. Patient was kept in recumbent position for 30 minutes and was monitored for uterine contractions, fetal heart rate and vital signs every ½ hourly for 6 hours. Monitoring was continued as for active labour, if labour supervened in this period.

Oral PGE2 administration for augmentation of labour:

In those patients who did not go into active labour, Bishop's score was reassessed after 12 hours, ARM was

done and 0.5 mg PGE2 per hour was administered orally. If labour pains were not induced within 4 hours then the dose of oral prostaglandins was doubled to 1 mg per hour. The dose was reduced to 0.5 mg once the patient was in active labour and continued till delivery.

RESULTS

The age of the selected patients ranged between 19 to 38 years. The mean age was 24.80 +/- 4.14 years. Sixty one (61%) were primigravidae and 39% were multigravida. The majority (23%) of these multiparas were second gravidae. The mean period of gestation at the time of induction was 38 weeks 5 Days +/- 1.52 weeks. The mean pre-induction Bishop's score was 4.56 +/- 1.56. In primigravidas the mean Bishop's score was 4.4 +/- 1.5 (42 primis had unfavourable cervix while 19 had favourable cervix. In multigravidae (39%) mean Bishop's score was 4.67 +/- 1.58 and 25 of these had unfavourable cervix prior to application of gel. The indications for induction are listed in table 1. The most common were PIH (27%) and IUGR (25%). in 22% there were more than one indications.

Table 1: Indications for induction of labour

Indication for Induction	No (%) of patients with one indication.	No of patients with more than one indication
PIH	27(27%)	14
IUGR	25(25%)	19
BOH	10(10%)	03
Post- Term Pregnancy	09(09%)	05
Elderly Primigravida	04(04%)	03
Essential Hypertension	03(03%)	03
Total	78(78%)	47*(22%)

*Thirteen cases had 3 indication, 19 cases had 2 indications.

Seventy two percent patients started having labour pains within 4 hours of gel application and 60% (31 primigravida and 29 multigravida) progressed into active labour and had normal unassisted vaginal delivery within 24 hours. Thirty one (31%) of these delivered within 12 hours. The mean instillation delivery interval was 10 hours 32 minutes (10.55 +/- 3.48 hours). The corresponding intervals for primigravidae and multigravidae were 11 hours 21 minutes and 9 hours 40 minutes respectively. One patient (1%) had cervical tear due to uterine

hypertonicity. (The total duration of labour in this case was 5 hours 05 minutes and second and third stages of labour were less than 5 minutes each.) Augmentation with oral prostaglandins.

Forty percent of patients (30 primigravida and 10 multigravida) who did not go into active labour with prostaglandin gel had reassessment of Bishop's score after 12 hours and the mean Bishop's score had increased from 4.5 to 7.4 in these cases.

Table 2: Change in Bishop's score 12 hours after PGE2 application

Author	No of Patients	Mean Bishop Score	
		Before gel application	After gel application
Theiry et al. ²	40	3.4	6.6
Patki et al. ⁷	40	2.6	5.0
Daftary et al. ⁸	60	3.2	7.6
Present study	100	4.5	7.4

Labour was augmented with oral PGE2 after ARM. The mean dose of oral PGE2 required to complete the labour was 4.30 mgm. The maximum single dose of 1mg per hour was required in only 2 (5%) of cases. The mean period of onset of labour was 53 minutes. It was 49 minutes in primiparas and 63 minutes in multigravidas. Thirty-three (82.5%) of the 40 patients whose labour was augmented with oral PGE2 had vaginal deliveries, 7 (17.5%) of these were forceps assisted deliveries. The mean IDI (Induction Delivery Interval) was 8.34 +/- 3.04 hours (Range: 2 hours 50 minutes to 15 hours 48 minutes). The mean IDI in primigravidae (24 cases) was 7 hours 08 minutes and in multigravidae (9 cases) was 6 hours. Caesarean delivery rate was 17.5% (7 patients) and the indications for caesarean section were foetal distress (1 case), non progress of labour (5 cases), deep transverse arrest (3 cases) and uterine inertia (3 cases). Both factors were co-existing in another case who had a thick septum between the presenting part and the internal os.

The mean Apgar score at 1 and 5 minutes was 6.5 +/- 1.2 and 8.4 +/- 1.1 respectively. The mean birth weight was 2657 gms +/- 440 gms. Seven (7%) patients experienced nausea and vomiting but were self limiting in all of these cases. There was one (1%) neonatal death on the 4th post natal day. The Apgar score was 2 at 1 minute in this case and the baby was resuscitated with endotracheal intubation. One (1%) patient had uterine hypertonus.

Overall failure rate (caesarean section) was 7% (Table 3).

Table 3: Labour outcome after induction with prostaglandins

Author	No of cases	No of cases delivered vaginally	No of C.S.	% of C.S.
Daftary et al. ⁸	60	48	12	20 %
Nimrod et al. ⁹	15	14	01	6.6 %
Freeney et al. ¹⁰	126	108	18	14.3 %
Present study	100	93	07	7 %

DISCUSSION

Calder AA and Trofater KF suggested that the local application of prostaglandins was an effective method of induction of labour.^{11, 12} Ulmsten et al. found that the endo-cervical application of PGE2 gel was safe, had minimal side effects with negligible incidence of uterine hypertonus.¹³ Daftary et al. observed that cerviprime gel is an effective inducing agent and when coupled with oral PGE2 it is effective in maintaining the progress of labour.⁸ In the present study cervical application of PGE2 gel acted as an inducing agent in 60% of total induced patients. In the remaining 40% of patients the Bishop's score improved from 4.5 to 7.4 in our study, whereas Daftary et al. reported an improvement from 3.2 to 7.6 in the same period (12 hours) as that of the present study.⁸ The incidences of successful inductions in previous studies were 60% (Nimrod et al.), 43.3% (Daftary et al.) and 73% (Freeney et al.).⁸⁻¹⁰ The pre induction Bishop's scores in the studies of Nimrod et al. and Freeney et al. were <4 and it was 3.2 in the study by Daftary et al. while in the present study the mean Bishop's score was 4.5.⁸⁻¹⁰

Labour was augmented with oral PGE2 after ARM and 33 (82.5%) of the remaining 40 women delivered vaginally with a mean IDI of 7 hours 21 minutes which is close to the IDI of 7 hours and 51 minutes reported by Patki et al.⁷ Only 7 (17.5%) of the remaining 40 women needed caesarean sections in emergency which compares favourably with 12 (35.3%) of 34 patients in the study by Daftary et al.⁸ The mean dose of oral PGE2 required for augmentation of labour was 4.30 mgm as compared to 3 mgm reported by Daftary et al.⁸ The overall caesarean section rate in our study was 7%

(Table 4) which compares well with 6.6% C.S. rate reported by Nimrod et al and is much lesser than 20% reported by Daftary et al.^{8,9}

Table 4: IDI with PGE2 gel & after augmentation with oral PGE2

	Primigravida	Multigravida	Overall (%)
Total no. of patients	61	39	100
Delivered within 12 hrs. of gel appln.	18	21	39 (39%)
Delivered within 24 hrs of gel appln.	13	08	21 (21%)
Mean IDI	11 hrs. 21 mins.	9 hrs. 40 mins.	10 hrs. 32 mins.
Augmented with ARM & PGE2	30	10	40 (40%)
Onset of labour after ARM + oral PGE2 augmentation	49 mins.	63 mins.	53 mins.
IDI after ARM & oral PGE2	8 hrs. 52 mins.	6 hrs. 05 mins.	7 hrs. 21 mins.
Total normal vaginal deliveries	48	38	86 (86%)
Total forceps vaginal deliveries	07	--	07 (07%)
Total Caesarean Sections	06	01	07 (07%)
Total complications	05	03	08 (08%)

The complication rate was 8% (7% had nausea and vomiting while 1% had uterine hypertonus) which is significantly low when compared to 35% gastrointestinal symptoms and 5% uterine hypertonus reported by Daftary et al. in their study.⁸ One perinatal death occurred in the present study.

CONCLUSION

Intra cervical PGE2 gel application is a convenient, acceptable, safe and effective method of induction of labour in high risk cases apart from its conventional role as a cervical ripening agent. Besides labour can be successfully augmented after ARM with oral administration of PGE2 instead of IV oxytocin infusion.

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