

# Intracervical PGE<sub>2</sub> Gel for Cervical Ripening and Induction of labour

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## Summary

Induction of labour in unfavourable cervix is a challenge to the obstetricians. This prospective study was conducted in our institution among 125 cases with a poor Bishop's score of 1-4, to evaluate the efficacy of intracervical PGE<sub>2</sub> gel. The mean initial score of 2.7, improved to 5.6 after 6 hours and 9.6 after 12 hours in 84% cases. Only 20 cases (16%) required reapplication of PGE<sub>2</sub> gel. The mean score in this group changed from 2.9 to 4.8 after 6 hours. The success rate in terms of vaginal delivery was 75.60% with initial Bishop's score (Bishop 1964) of 1-2 and 88.09% in cases with a score of 3-4. The overall success rate was 84%, the IUCS rate being 16%. The complications or side effects were minimum and the neonatal outcome was very good.

## Introduction

The precise sequence of events that lead to onset of labour in human female is not yet known. Cervical ripening is an important prerequisites for the process. Prostaglandins have a physiological role in labour and in particular PGE<sub>1</sub> is responsible for softening of cervix by inducing collagen breakdown, dispersion and fluid absorption by stromal tissue. Unfavourable cervix poses a challenge to the obstetricians. When compared with the use of oxytocin for induction of labour, the consensus of opinion goes in favour of intracervical PGE<sub>2</sub> gel (Dattary, 1999).

Local application has a target action on cervical tissue, causing softening and effacement. It is a vasodilator and brings in more neutrophils to cervical tissue (Kelly, 1994) which liberate collagenase and elastase which breakdown the collagen fibrils and make the cervix ripe.

## Aims and Objectives

The aim of this study was to evaluate the efficacy of intracervical PGE<sub>2</sub> gel as cervical ripening agent in unfavourable cervix for induction of labour and note the changes in the Bishop's Score, induction delivery interval, nature of labour and foeto-maternal outcome.

## Materials and Methods

This prospective study was carried out in the Department of Obstetrics and Gynaecology, Chittaranjan Seva Sadan College, Calcutta in the 1<sup>st</sup> half of 1999 in 125 cases.

The inclusion criteria were (1) gestational age >35 completed weeks, (2) singleton living foetus with cephalic presentation and (3) reactive NST. Foetal biophysical profile scoring was done in some cases. The patients with previous uterine scar, CPD, grand

multiparity, IUFD, APH, asthma, gross oligohydramnios and pregnancy following vaginal plastic surgery were excluded from this study.

Before introduction of intracervical PGE<sub>2</sub> gel Bishop's scoring was recorded. Only subjects with a score of 1-4 were included for PGE<sub>2</sub> gel application.

Intracervical PGE<sub>2</sub> gel (0.5 mg) was instilled using prefilled syringe. Bishop's score was recorded every 6 hrs. interval, if it remained less than 5 after 12 hrs., reapplication was done. When the score remained below 5 after 6 hrs. of second application, it was taken as failure. If the score  $\geq 5$  but good uterine contractions were not established, oxytocin infusion was added.

### Analysis of Results and Discussion:

**Table-I: Indications of induction**

Indications	No. of Cases	Percentage
Postdated pregnancy	58	46.4
PIH	32	25.6
PROM	21	16.8
IUGR	7	6.5
Rh Negative	3	2.4
Others (Diabetes, BOH etc.)	4	3.2

The commonest indications for induction of labour (Table-I) was postdated pregnancy (46.4%) followed by PIH (25.6%) and PROM (16.8%). The other indications were IUGR, Rh negative, diabetes etc. The initial Bishop's score (Table-II) at the time of PGE<sub>2</sub> gel introduction had a significant influence on the success of induction. The success rate was 75.60% when the score was low (1 or 2)

and as high as 88.09% when the score was 3 or 4. The overall success rate was 84%. This result is comparable with the study of Barbhaiya et al (1998). They found the success rate as 71.42% when the score was 1 or 2 and 96.96% when 3 or 4 while the overall success rate of 88.11%.

As Table-III illustrates, a gradual but progressive change in Bishop's score occurred in successful cases. The score improved from 2.9 to 4 in every 6 hrs. Amongst the subjects requiring reapplication, the rate of progress was slower. This result is very much similar to that of Barbhaiya et al (1998).

Vaginal delivery occurred in 84% cases (Table-IV) out of which 13 cases (10.4%) had forcep's delivery. The incidence of LUCS was 16%, the indications being failed inductions in 10 cases, foetal distress in 8 and inco-ordinate uterine action in 2. The results are comparable with the study of Gupta et al. (1995). They found vaginal delivery in 80% cases and forceps in 13.3%. They also observed the incidence of failed induction and foetal distress to be 13.3% and 4.4% respectively. In a review Daftary (1999) found the incidence of vaginal delivery to be 62.4% to 100%. Mukherjee et al (1996) had the section rate was 16.3%, similar to our study.

As is evident from Table-V, the induction delivery interval was shortened, 45 cases (42.85%) delivered within 12 hr., out of which 17 were primigravida and 19 were secondgravida. There was no second or more gravidas remaining for labour after 18 hrs., if initial Bishop's score was 3 or 4. Singh and Sood (1997) observed that in 48% cases, delivery occurred

**Table-II: Correlation of initial Bishop's Score, Parity and Success rate**

Gravida	Score 1-2	Score 3-4	Total
G <sub>1</sub>	No.	21	62
	Success	15 (71.42%)	54 (87.09%)
G <sub>2</sub>	No.	14	16
	Success	12 (85.71%)	14 (87.50%)
G <sub>3</sub>	No.	6	6
	Success	4 (66.66%)	6 (100%)
Total	No.	41	84
	Success	31 (75.60%)	74 (88.09%)

Table-III  
Changes in Bishop's Score (N=125)

Score	At application	After 6 hrs.	After 12 hrs. No.=105(84%)
Mean	2.7	5.6	9.6
Range	1-4	1-11	1-11
<b>Reapplication</b>	<b>(20 cases)</b>	<b>After 6 hrs. of Reapplication.</b>	
Mean	2.9	4.8	
Range	1-4	1-11	

Table-IV  
Mode of delivery (N=125)

Route of Delivery	No. of Cases	Percentage (%)
Vaginal delivery	105	84
Normal	92	
Forcep's	13	
LUCS	20	16
Nonprogress & Failed induction	10	
Foetal distress	8	
Incoordinate Uterine action	2	

Table-V  
Application - delivery interval in vaginally delivered cases  
(N=105)

Hours	G <sub>1</sub>		G <sub>2</sub>		G <sub>3</sub>	
	1-2	3-4	1-2	3-4	1-2	3-4
< 6	0	4	1	5	1	4
> 6-12	1	12	6	7	2	2
> 12-18	4	13	3	2	1	0
> 18	10	15	2	0	0	0

Table-VI  
Maternal and Foetal Complications

Complications	No. of cases	Percentage (%)
<b>Maternal</b>		
Hyperstimulation	2	1.6
Vomiting	2	1.6
PPH	6	4.8
P. Sepsis	5	4.0
Others (UTI, Diarrhoea, Psychosis etc.)	4	3.2
<b>Foetal</b>		
Birth asphyxia (5min. Apgar: <7)	6	4.8
Jaundice	12	9.6
Meconium Aspiration	2	1.6
Septicaemia	4	3.2
RDS	1	0.8
Neonatal mortality	3	2.4
Mean birth weight: 2630 gms.		

within 10 hrs. In the review by Daftary (1999) covering 15 studies, the mean duration of labour in primigravida was 10.8 hrs and in multigravida, 7.6 hrs compared to 16.2 hrs and 9.6 hrs respectively with oxytocin.

As shown in Table-VI, the incidences of maternal hyperstimulation, PPH and P.Sepsis were 1.6%, 4.8%, 4% respectively. Gupta et al (1995) who observed these incidences as 4.4%, 11.1% and 4.4% respectively. The incidences of neonatal jaundice, septicaemia, birth asphyxia (5' Apgar < 7) and neonatal mortality were 9.6%, 3.2%, 4.8% and 2.4% respectively. These incidences are comparable to those of Gupta et al (1995) who found them to be 11.1%, 11.1%, 4.4% and 2.2% respectively.

## References

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