

# Role of Dinoprostone PGE2 Gel Application on Feto-Maternal Outcome in Tertiary Care Centre

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**Abstract:** Background: Induction of labour is an intervention to artificially initiate uterine contractions leading to progressive dilatation and effacement of cervix and birth of baby. Recently, elective induction of labour at term have increased dramatically in the interest of mother or baby or both. Although Dinoprostone gel is considered as the preferred method for labour induction. Objective: Our study is being carried out to assess the efficacy of prostaglandin E2 gel and to watch the maternal and fetal outcome of labour after single versus double applications. Material and Methods: It was a Descriptive observational study carried in a Mathura das Mathur hospital Dr S N Medical College Jodhpur, a tertiary care hospital in Rajasthan. All women after 37th week's gestation with single live fetus in cephalic presentation with a Bishop score <6 and a reactive non-stress test were included in this study. Results: A total 300 patients studied and analysed to assess the efficacy of prostaglandin E2 gel and maternal and fetal outcome of labour after single versus double applications. Most common indication for induction with PGE2 gel was oligohydramnios (30.33%) followed by HDOP (20.66%). In single application group 61.33% cases delivered vaginally while in cases of double application 74.66% delivered vaginally. In our study LSCS delivery in single v/s double application was 34 v/s 23.33% respectively. Maternal complications were in single application 18.67% v/s double application 28%. 88% of new born in single application had APGAR score of >7 and 92% in double application had APGAR score of >7. In single application group new born delivered with APGAR score <7 were 12% cases and in double application were 8%. Conclusion: Dinoprostone gel application is efficient in achieving cervical ripening and successful labour with reduction in latent phase of labour and total delivery time without increasing the rate of caesarean section and obstetric risk.

**Keywords:** Induction of labour, cervical ripening

## 1. Introduction

Induction of labour is an intervention to artificially initiate uterine contractions leading to progressive dilatation and effacement of cervix and birth of baby<sup>1</sup>.

Recently, elective induction of labour at term have increased dramatically in the interest of mother or baby or both. Although Dinoprostone gel is considered as the preferred method for labour induction.<sup>2</sup>

The beneficial effect of labour induction in term pregnancy has always been controversial<sup>3-7</sup>. However, in post term pregnancy, it has shown to improve maternal and fetal outcome<sup>8,9</sup>.

In addition, labour induction for medical indications such as oligohydramnios, maternal diabetes, pregnancy related hypertension, Intrauterine Growth Restriction (IUGR) at term is prevalent with an optimism that it would significantly reduce maternal and fetal morbidity. These indications for labour induction are solely based upon literature with conflicting evidences<sup>10,11,12</sup>.

Cervical ripening is an essential prerequisite for induction and is assessed with Bishops scoring system. A favourable cervix is with a modified Bishop score of more than 8 and unfavourable cervix with a Bishop score of < 4. The development of "Prostaglandins" has revolutionized the management of cases with unfavourable cervix. In order to improve cervical score and induce myometrial contractility,

prostaglandins in various forms and preparations have been used<sup>13</sup>.

Dinoprostone is prostaglandin E2 (PGE2) act as "local hormone" a very rapidly metabolised in the tissue of synthesis (the half-life estimated to be 2.5 to 5 minutes). Method of administration is endocervically for the ripening of cervix, may stimulate the gravid uterus to contract in a manner similar to contractions seen in the term of uterus during labour. (Dose of dinoprostone gel = 0.5mg)

Traditionally, medical, surgical or combined methods have been in use for labour induction, comprise of PGE1 (misoprostol), PGE2 gel (dinoprostone), oxytocin, Foleys catheter, laminaria tent, membrane stripping, amniotomy and extrauterine saline infusion.<sup>14,15</sup> however, prostaglandins remain the preferred choice for labour induction in unfavourable cervix.

Our study is being carried out to assess the efficacy of prostaglandin E2 gel and to watch the maternal and fetal outcome of labour after single versus double applications.

## 2. Materials and Methods

It was a Descriptive observational study carried in a Mathura das Mathur hospital Dr S N Medical College Jodhpur, a tertiary care hospital in Rajasthan. After taking informed consent, 300 women with singleton term live pregnancy fulfilling inclusion criteria admitted for induction of labour were recruited for our study.

All women after 37th week’s gestation with single live fetus in cephalic presentation with a Bishop score <6 and a reactive non-stress test were included in this study. Patients were excluded if they had previous caesarean section, genital herpes, severe preeclampsia, heart disease, antepartum haemorrhage, severe co-morbid illness and pregnancy with fetal compromise. Preterm mothers were also excluded from the study.

A detailed history was taken and thorough general, abdominal and pelvic examination was done. Digital cervical evaluation was performed at the initiation of induction of labour and score assigned as per Modified Bishop’s scoring system. Women with a score of 6 or less were included in the study dividing them in respective groups i.e.

Group-A: Induction by single dose of Dinoprostole gel (0.5 ml) {PGE2 gel}.

Group-B: Induction by 2nd dose 6 hrs after previous dose in women who did not have successful induction with single dose.

During the use of dinoprostone gel, uterine activity, fetal status, cervical dilatation and effacement should be carefully monitored to detect any undesirable effects like hypertonic myometrial contractions or fetal distress.

### 3. Results

In our study total 300 patients studied and analysed.

**Table 1:** Distribution of Cases According to indication of Application of PGE2 Gel

| Maternal indication    | No | %     |
|------------------------|----|-------|
| Post dated             | 42 | 14    |
| Oligohydramnios        | 91 | 30.33 |
| Diabetes               | 26 | 8.66  |
| HDOP                   | 62 | 20.66 |
| PROM                   | 38 | 12.67 |
| Prolonged latent phase | 22 | 7.33  |
| Reduced fetal movement | 19 | 6.33  |

In our study most common indication for induction with PGE2 gel was oligohydramnios (30.33%) followed by HDOP (20.66%).

**Table no. 2** Distribution of Cases According to Mode of Delivery & Number of Application of PGE2 Gel

| Mode of delivery      | Application of PGE2 Gel |        |        |        | Total |        |
|-----------------------|-------------------------|--------|--------|--------|-------|--------|
|                       | Single                  |        | Double |        | No    | %      |
|                       | No                      | %      | No     | %      |       |        |
| Normal delivery       | 92                      | 61.33% | 112    | 74.66% | 204   | 68%    |
| Instrumental delivery | 7                       | 4.66%  | 3      | 2%     | 10    | 3.33%  |
| LSCS                  | 51                      | 34%    | 35     | 23.33% | 86    | 28.67% |
| Total                 | 150                     | 100%   | 150    | 100%   | 300   | 100%   |

In single application group 61.33% cases delivered vaginally while in cases of double application 74.66% delivered vaginally. In our study LSCS delivery in single v/s double application was 34 v/s 23.33% respectively. Instrument delivery in single v/s double application was 4.66% v/s 2%.

**Table 3:** Distribution of Cases According to Maternal Complications & Number of Application of PGE2 Gel

| Maternal complications | Application of PGE2 Gel |        |        |      | Total |        |
|------------------------|-------------------------|--------|--------|------|-------|--------|
|                        | Single                  |        | Double |      | No    | %      |
|                        | No                      | %      | No     | %    |       |        |
| Present                | 28                      | 18.67% | 42     | 28%  | 70    | 23.33% |
| Absent                 | 122                     | 81.33% | 108    | 72%  | 230   | 76.67% |
| Total                  | 150                     | 100%   | 150    | 100% | 300   | 100%   |

Maternal complications were in single application 18.67% v/s double application 28%.

**Table 4:** Distribution of Cases According to APGAR Score at 5 Min & Number of Application of PGE2 Gel

| Apgar score at 5min | Application of PGE2 Gel |      |        |      | Total |      |
|---------------------|-------------------------|------|--------|------|-------|------|
|                     | Single                  |      | Double |      | No    | %    |
|                     | No                      | %    | No     | %    |       |      |
| <7                  | 18                      | 12%  | 12     | 8%   | 30    | 10%  |
| >7                  | 132                     | 88%  | 148    | 92%  | 270   | 90%  |
| Total               | 150                     | 100% | 150    | 100% | 300   | 100% |

88% of new borns in single application had APGAR score of >7 and 92% in double application had APGAR score of >7. In single application group newborns delivered with APGAR score <7 were 12% cases and in double application were 8%.

### 4. Discussion

A total 300 patients studied and analysed to assess the efficacy of prostaglandin E2 gel and maternal and fetal outcome of labour after single versus double applications.

In our study, we observed 28.67% incidence of caesarean delivery with acceptable risk of adverse fetomaternal outcomes in women requiring induction of labour for medical indications. In single application group 61.33% cases delivered vaginally while in cases of double application 74.66% delivered vaginally. In our study LSCS delivery in single v/s double application was 34 v/s 23.33% respectively. Similar results have also been observed by Chandra R et al<sup>16</sup> In single application group 59% cases delivered vaginally while in cases of double application 75% delivered vaginally and LSCS delivery in single v/s double application was 27% v/s 20% respectively.

We also studied that Maternal complications was in single application 18.67% v/s double application 28%. Similar results have also been observed by Chandra R et al<sup>16</sup> in single application 16% v/s double application 20%.

We also studied that 88% of new borns in single application had APGAR score of >7 and 92% in double application had APGAR score of >7. In single application group new borns delivered with APGAR score <7 were 12% cases and in double application were 8%. Similar results have seen in Chandra R et al<sup>16</sup>-92% of newborns in single application had APGAR score of >7 and 94% in double application had APGAR score of >7 and In single application group newborns delivered with APGAR score <7 were 8% cases and in double application were 6%.

We studied that most common indication for induction with PGE2 gel was oligohydramnios (30.33%) followed by HDOP (20.66%), post dated (14%) ,PROM(12.67%), and Diabetes(8.66%).

Labour induction is one of the most common intervention in obstetric practice. A simple application of PGE2 intracervical gel can ripen the cervix effectively and improve Bishop's score there by helping in successful vaginal delivery. However better outcome always depends on awareness of contraindication, proper application and understanding of possible complications and handling then effectively.

Pre-induction cervical ripening with the dinoprostone slow-release vaginal insert is associated with a high rate of women undergoing vaginal delivery within 24 hours, with a shorter stay. Considering its good performance, the dinoprostone slow-release vaginal insert is the first choice for elective induction of labour in postdate pregnancy.

## 5. Conclusion

Our data suggest that Dinoprostone gel application is efficient in achieving cervical ripening and successful labour in nulliparous as well as multiparous along with reduction in latent phase of labour and total delivery time without increasing the rate of caesarean section and obstetrical risk.

Secondary application of PGE2 gel significantly improves the chances of cervical ripening in cases who had unfavourable cervix. There is decrease in total duration of labour and increase in the chances of vaginal deliveries but strict vigilance is required for both maternal and fetal parameters specially in cases of second applications.

So, we concluded that Dinoprostone gel application is efficient in achieving cervical ripening and successful labour with reduction in latent phase of labour and total delivery time without increasing the rate of caesarean section and obstetric risk.

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