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Original Research Article

## Effectiveness of dinoprostone vaginal pessary in induction of labour at term

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### ABSTRACT

**Background:** Induction of labour is a very common obstetric procedure worldwide. The ultimate goal of induction of labour is to achieve a successful vaginal delivery. Dinoprostone is a Prostaglandin (PGE<sub>2</sub>) which acts on the collagen structural network of the cervix and makes it favourable, thus increasing the chances of a successful of a vaginal delivery. This study emphasizes on the importance of having a proper induction protocol in place and at the same time judicious use of the agents for induction of labour. This will help to reduce the maternal anxiety and stress associated with the induction of labour. The present study was undertaken to assess the effectiveness of dinoprostone vaginal pessary in induction of labour at term.

**Methods:** Twenty patients with unfavorable cervix at term were studied for the effectiveness of Dinoprostone vaginal pessary in induction of labor.

**Results:** Among the twenty patients 17 (85%) delivered vaginally within 18 hrs and 3 (15%) were in the active phase of labour. No untoward event was observed in any of the cases with a favorable neonatal outcome in all the cases.

**Conclusions:** Present study shows that Dinoprostone vaginal pessary is a highly effective method of induction of labor at term in properly selected cases. It reduces consistently the number of internal examinations and thus reducing the risk of ascending infections adding to its safety along with reduced maternal anxiety associated with induction of labour.

**Keywords:** Dinoprostone, Induction of labour, Maternal anxiety, Vaginal pessary

### INTRODUCTION

Induction of labour is a common procedure worldwide with overall rates in many countries now exceeding 20% of all births.<sup>1,2</sup>

Induction of labour is indicated when the risk of continuing pregnancy, for the mother or the fetus, exceeds the risk associated with induced labour and delivery.<sup>3</sup>

Preeclampsia  $\geq 37$  weeks, significant but stable antepartum hemorrhage, chorioamnionitis, suspected fetal

compromise and prelabour rupture of membranes at term are the high priority indications for induction of labour at term. The goal of induction of labor is to achieve a successful vaginal delivery.<sup>3</sup>

Many different methods have been used, but prostaglandins remain a preferred method for cervical ripening and labour induction.<sup>1,4,5</sup>

Dinoprostone is a Prostaglandin (PGE<sub>2</sub>) which acts on the collagen structural network of the cervix and makes it favourable thus increasing the chances of a successful of a vaginal delivery.

Dinoprostone is the preferred form of prostaglandin and has been shown to increase the rate of vaginal delivery within 24 h and is generally given when the cervix has a Bishop's score of  $\leq$ six.<sup>6</sup>

Dinoprostone vaginal pessary is presented as a thin, flat semi-transparent polymeric vaginal delivery system which is rectangular in shape with rounded corners contained within a knitted polyester retrieval system containing 10 mg of dinoprostone which is dispersed throughout its matrix.

The advantages of the vaginal delivery system are reduction in the number of internal examination, improved patient compliance, easy to insert and easy to remove and an easy learning curve.

**METHODS**

This study included 20 pregnant women at term (37 completed weeks of gestation) attending the department of Obstetrics and Gynecology at INHS Asvini during November 2016 to February 2017.

**Table 1: Indications for induction of labour.**

Indication	No. of cases	Percentage
Prelabour rupture of membranes	10	50
Postdatism	06	30
Preeclampsia	03	15
Fetal distress	01	05

As shown in the Table 1, half of the cases (50%) for induction of labour in the present study were prelabour rupture of membranes at term followed by postdatism. This are the high priority indications for the induction of labour worldwide.<sup>3</sup>

**Inclusion criteria**

- Singleton pregnancy
- Cephalic presentation
- Gestational age >37 weeks

**Exclusion criteria**

- Gestational age <37 weeks
- Previous uterine surgery
- Abnormal presentation

Twenty pregnant women who fulfilled the inclusion criteria were included in the study. A detailed case record was maintained of each and every case. A thorough clinical examination along with investigations like complete urine examination, hemogram and random blood sugar, obstetric usg and a 20 minutes non-stress test for fetal well-being were done. All the patients were informed in detail about the induction protocol and a written informed consent was taken.

Internal examination was done under strict aseptic precautions for assessment of cervix and Bishop's score was calculated. Dinoprostone vaginal pessary was inserted high into the posterior fornix under strict aseptic precautions in twenty pregnant women who satisfied the inclusion criteria, with a Bishop's score of <6. After the insertion of pessary they were asked to lie on bed for an hour. This allows the pessary to absorb vaginal moisture which makes it swell and prevents it from falling out.<sup>7</sup> Patients were assessed after 18 hours from the time of insertion along with the monitoring of fetal heart unless indicated early due to uterine hyperstimulation, fetal heart rate abnormalities.

At least four regular uterine contractions during a 10-minute observation period, along with the effaced cervix and os >4cm dilated on internal examination was considered as Active labor.

**RESULTS**

The Results were analyzed according to the maternal age and parity, induction-delivery interval and complications if any.

**Table 2: Parity of cases.**

Parity	No. of cases	Percentage
Nulliparous	15	75
Multiparous	05	25

As shown in the Table 2, majority of the patients were nulliparous (75%). Rest five of the patients had at least one living issue delivered vaginally.

**Table 3: Age distribution of the cases.**

Age in years	Number of cases	Percentage
20-25	05	25
26-30	12	60
>30	03	15

Table 3 shows us the age distribution of the patients. 60% of the patients belonged to the age group of 26-30 years. Three patients in the present study belonged to the age group of >30 and were nulliparous.

**Table 4: Gestational age distribution.**

Gestational age in weeks	No. of cases	Percentage
>37<40	17	85
>40	03	15

As shown in the above Table 4, 3 patients in the present study had gestational age of >40 weeks. 85% of the cases in this study belonged to the gestational age of >37 weeks and <40 weeks.

Majority of the patients (70%) had a successful spontaneous vaginal delivery in the present study. 3 cases

in this study delivered uneventfully by vacuum, due to failure of secondary powers. Remaining three patients were in active labour at end of 18 hours observation period.

**Table 5: Mode of delivery.**

Mode of delivery	No. of cases	Percentage
Spontaneous vaginal delivery	14	70
Assisted vaginal delivery	03	15

*Induction-delivery interval*

Average Induction-delivery interval in the present study was 18 hours. 3 patients (nulliparous with age >30 yrs) who were in active labor after 18 hours, delivered vaginally after oxytocin acceleration. Absolutely zero cesarean section rate in this study adds to its merit and the importance of having a proper induction protocol in place.

*Neonatal outcome and complications*

All babies had an Apgar score of 10 at one minute. Uterine Hyperstimulation and diarrhoea was observed in one and two patients respectively. No foetal complications were observed in the present study.

Breastfeeding was established within half an hour of delivery in all the cases. Healthy mother and baby were discharged after neonatal immunization and screening along with necessary advice to the mothers about contraception and importance of exclusive breastfeeding.

**DISCUSSION**

Induction of labour is a very commonly performed intervention in Obstetrics. Proper selection of the cases for induction of labour and judicious use of the agents for induction of labour is thus very important.

Study conducted by Triglia MT et al, found spontaneous vaginal delivery in 72% patient with dinoprostone pessary as compared to gel preparation as compared to spontaneous vaginal delivery in 85% of cases in the present study.<sup>8</sup> Assisted Vaginal delivery with vacuum was conducted in 3 patients for failure of secondary powers.

The average induction-delivery interval in this study was 18 hours. Rest of the three patients, nulliparous with age>30 years were in active phase of labour at the end of 18 hours and delivered vaginally with oxytocin acceleration. Recent studies have shown that Dinoprostone is the preferred form of prostaglandin and compared to placebo, vaginal PGE2 has been shown to increase the rate of vaginal delivery within 24 h.<sup>9,10</sup> Meta-analysis conducted by M Ekaterina and et al showed that

the risk of cesarean delivery following labour induction was significantly lower than the risk associated with expectant management.<sup>11</sup>

The present study shows that dinoprostone vaginal pessary is highly effective in induction of labor at term and even in postdated cases. Labour induction is associated with benefits for the fetus and no increased risk of maternal death. No untoward event was noted in any of cases throughout the course of labour before and after.

Uterine hyperstimulation and diarrhea was observed in one and two patients respectively. In these cases vaginal pessary was removed immediately under strict aspect precautions and the cervical findings in all the three cases were favourable.

The strength of the above study lies in the favourable neonatal outcome in all the twenty patients including one patient with foetal distress. These results are in line with the largest study to date by Kellie T et al that focusses primarily on the safety of dinoprostone vaginal pessary when used for more than 12 hours. This study has confirmed that use of dinoprostone vaginal pessary for up to 24 h is safe both in terms of uterine tachysystole and neonatal and maternal morbidity.<sup>12</sup> Past studies have suggested that it can be left in longer with no apparent detrimental effects.<sup>13,14</sup>

Failed induction of labour results in cesarean section which adds to the stress of both mother and the obstetrician.<sup>15</sup> This study had a successful induction of labour in all the cases thus reducing the maternal stress and anxiety associated with the induction of labour.

**CONCLUSION**

Dinoprostone vaginal pessary is highly effective in the induction of labour at term in properly selected cases. It reduces consistently the number of vaginal examinations and thus reducing the risk of ascending infections adding to its safety along with reduced maternal anxiety associated with induction of labour. Further research is needed to determine the cost effectiveness.

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