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Original Research Article

An Observational study on Vaginal Delivery Rate in Term Pregnancies with One Versus More Than One Dinoprostone Gel Administration at Medical College in South-Eastern Rajasthan

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Abstract:

Background: Induction of labour using dinoprostone gel is a common obstetric practice for cervical ripening in term pregnancies with an unfavourable cervix. The response to induction may vary between primigravida and multigravida women, particularly with respect to the number of gel applications required and the eventual mode of delivery.

Objectives: To compare the vaginal delivery rate in term pregnancies receiving one versus more than one dinoprostone gel application and to assess differences in outcomes between primigravida and multigravida women.

Materials and Methods: This observational study was conducted in the Department of Obstetrics and Gynaecology, Jhalawar Medical College, Rajasthan, from January 2018 to March 2018. Sixty low-risk term singleton pregnancies with Bishop's score <7 were included. Vaginal dinoprostone gel (0.5 mg) was administered, and outcomes were compared between women receiving one gel versus multiple gel applications. Data were analysed using descriptive statistics and chi-square test. A p-value <0.05 was considered statistically significant.

Results: Out of 60 cases, 30 were primigravida and 30 were multigravida. Vaginal delivery occurred in 76.66% of primigravida and 93.33% of multigravida women. One gel application was sufficient in 53.33% of primigravida and 76.66% of multigravida cases. The requirement of multiple gel applications was significantly higher in primigravida women ($p<0.05$). Headache was the most common adverse effect observed.

Conclusion: Dinoprostone gel is an effective and safe agent for induction of labour, with better response observed in multigravida women. Requirement of multiple gel applications is associated with increased chances of cesarean delivery, particularly in primigravida women.

Keywords: Induction of Labour, Dinoprostone Gel; Cervical Ripening; Vaginal Delivery; Primigravida And Multigravida.

Introduction

Labor induction is explained as; ¨the stimulation of uterine contractions before the onset of spontaneous labour, by any method (medical, surgical or combined) for the purpose of vaginal delivery¨. This is an obstetric intervention that should be performed when elective birth is advantageous for both the mother and the baby. Induction of labour is an intervention that is performed on most pregnant women. Induction of labour is performed in 20% of all births. It is used to perform the intentional cessation of spontaneous labour for the delivery of the feto placental unit. [1] Dinoprostone is a good cervix ripening agent and is good for labour induction. Dinoprostone in the form of gel is a product that has been on the market for several decades in the United States. It is used for cervix ripening and induction of labour for full term (37 weeks of gestation and above) mothers with unfavourable cervix (Bishop's score<7) [2] Induction is useful in a number of clinical situations, although capturing the evidence to support these has

been done in other Cochrane systematic reviews and clinical guidelines (NICE 2008).[3]

The start and promotion of physiological labour activities are intricate and multi-faceted. Healthy pregnancies are characterized by the relaxation of the uterus and the firm and closed cervix and are long. The uterus begins to change when labour is approaching. The cervix "ripens," becoming softer and shorter (effacement) and opens. The uterine smooth muscle begins to respond to stimuli that trigger the labour conctracrioons. Numerous physical and pharmacological methods stimulate the start of labour[4]. For example, Prostaglandin E2 (PGE2, Dinoprostone) is one of the most common prostaglandins used for this purpose. Prostaglandins have many alternative preparations such as oral, injectable, intravenous, and intracervical. Prostaglandins are hormones that the body produces from arachidonic acid cyclo-oxygenase. The first studies recognizing the role of prostaglandins for cervical ripening and the start of labour were conducted in the 1960s. Prostaglandins also have various effects on many receptors in the body causing some of the unwanted effects when used. The choice between oral and intravenous preparations is made to reduce the side effects associated with oral and injectable methods. Prostaglandin vaginal preparations (gels, tablets, suppositories, and pessaries) have many of the same side effects. The regimens also vary in dosages used, the number of different prostaglandin preparations, and the timing of repeated prostaglandin applications [5,6].

While PGF2a causes myometrial contraction, PGE2 is primarily essential for cervical ripening. In addition to having more collagenolytic activity, PGE2 also makes the myometrium more sensitive to oxytocin. Applying Dinoprostonegel (PGE2– 0.5 mg) gel to the cervix is the gold standard for cervical ripening. 3 to 4 doses can be given, with a repeat dose every 6 hours if needed. After application, the pregnant mother is to lie in bed for 30 minutes and she needs to be monitored for any uterine activity and, and for the fetal heart rate. [4,7]

Method: From January 2018 to March 2018, the study was carried out at the Department of Obstetrics and Gynaecology, Jhalawar Medical College. This was an observational study of a cohort of 60 low risk term singleton pregnancies, where vaginal dinoprostone gel was compared for one versus more than one for successful vaginal deliveries. All patients provided informed consent. The study was conducted after receiving approval from the Institutional Ethical Committee.

Inclusion Criteria: Women of full-term pregnancy with one, two, and three gravidas (38 to 41 weeks of gestation), with intact membranes and an unfavorable cervix having Bishop's score less than 7.

Exclusion Criteria: Women over 41+6 weeks of gestation, multigravidas (more than 3), those with a history of previous cesarean sections and myomectomies, and high-risk pregnancies.

Designing the Data Collection Form: A data collection form was created and the necessary data was gathered from the patient's case sheet. The data contained name, age, weight, identification no., last menstrual period (LMP), estimated date of delivery (EDD), gravida status, application of the gel, outcome of mother and baby and the report of ADR's.

Statistical analysis: Data were analysed using descriptive statistics. Categorical variables were compared using the chi-square test. A p-value <0.05 was considered statistically significant.

Table 1: Number of gel requirement in primigravida and multigravida pregnancy

Parity	No. of Dinoprostone Gel		
	One Gel	Two Gel	Three Gel
Primigravida Cases	16	9	5
Multigravida Cases	23	4	3

Table 2: Distribution of cases according to the mode of delivery-

Parity	Vaginal Deliveries		LSCS	
	No	%	No	%
Primigravida Cases	23	76.66	7	23.33
Multigravida Cases	28	93.33	2	6.66

Table 3: Comparative analysis between primigravida and multigravida in normal delivery vs LSCS after no. of gel administration

	1 Gel	2 Gel	3 Gel
Normal delivery-Primigravida	**16 (69.6%)**	**6(26.1%)**	**1 (4.3%)**
Normal delivery-Multigravida	23 (82.1%)	4(14.3%)	1(3.6%)
LSCS -Primigravida	0	3 (42.9%)	4 (57.1%)
LSCS-Multigravida	0	0	2 (100%)

Results and Discussion

A total of 60 term pregnant women were included in the study, comprising 30 primigravida and 30 multigravida cases. Vaginal delivery was achieved in 76.66% of primigravida women and 93.33% of multigravida women, while the rate of lower segment caesarean section (LSCS) was higher among primigravida women (23.33%) compared to multigravida women (6.66%). One application of dinoprostone gel was sufficient in 53.33% of primigravida cases and 76.66% of multigravida cases. Two gel applications were required in 30% of primigravida and 10% of multigravida women, whereas three gel applications were required in 16.66% and 10% of primigravida and multigravida women, respectively. The requirement for multiple gel applications was significantly higher in primigravida women ($p<0.05$). Multigravida women showed a significantly higher rate of successful vaginal delivery with fewer gel applications compared to primigravida women ($p<0.05$). The LSCS rate increased significantly with an increasing number of gel applications ($p<0.01$). Headache was the most commonly reported adverse effect in both groups, followed by nausea and diarrhea, with no serious maternal or neonatal complications observed.

In the table, we can see the distribution of both pre and post induction inter-cervical scores. The inter-cervical application of the Dinoprostone gel increased the scores on the Bishop's test. The table indicates that Dinoprostone gel is more effective in multigravida cases than in primigravida cases. Table 2 indicates that of the multigravida women, 93.33% had a normal vaginal delivery while 76.66% of the primigravida women had a normal vaginal delivery. Primigravida women had a lower segment caesarean section in 23.33% of cases, whereas this occurred in only 6.66% of the multigravida cases. 66.66% of the primigravida cases had a segmental caesarean section due to failed induction, and 33.33% had a segmental caesarean section due to fetal distress. In addition, it was noted that all of the multigravida cases that had a segmental caesarean section did so because of failed induction. Table 3 describes the cases in the normal delivery primigravida group. Here, 69.6% required one gel, 26.1% required 2 gels, and 4.3% required 3 gels. In the normal delivery multigravida group, 82.1% needed one gel, 14.3% needed 2 gels, and 3.6% required 3 gels. Among those who had a cesarean section, in the primigravid group, 42.9% needed two gels, while 57.1% needed three gels, whereas in the multigravida group, three gels were used before the cesarean section was done. Headache (26.66%) was the most common side effect reported by most patients. In the primigravida group, approximately 18.33% of the patients experienced nausea, while 16.66% had diarrhea. Only a small number of patients experienced other side effects, such as vomiting, fever, and dizziness. In the multigravida group, headaches were also the most common side effect, and some patients had minor side effects, such as vomiting, diarrhea, dizziness, and nausea [8,9].

Conclusion

In this study, we found that of the two, Dinoprostone gel had more effect on multigravida, while less effect in primigravida cases. The absence of neonatal deaths or life-threatening situations during the study demonstrated that Dinoprostone gel is safe. Dinoprostone gel has the most effect in terms of success, side effects, and acceptability. Women who need multiple gel insertions have a higher chance of not achieving a vaginal delivery within 24 and 48 hours.

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