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Original Article

SUCCESSFUL INDUCTION OF LABOUR WITH DINOPROSTONE IN BEYOND 36 WEEKS OF PREGNANCIES: AN OBSERVATIONAL STUDY

Komal Imtiaz✉, Qurat ul Ain, Maria Nawaz
Department of Obstetrics and Gynaecology, King Abdullah Teaching Hospital Mansehra, Health Department KP Pakistan

Background: Induction of labour (IOL) is a common practice that accounts for 20 % of all births. Different methods for IOL are practised today, including vaginal tablets of Dinoprostone, which is not yet studied in the current context. This study aims to assess the success rate of IOL with Dinoprostone in women with beyond 36 weeks of pregnancy. **Methods:** This descriptive cross-sectional study was conducted in the Department of Obstetrics and Gynaecology, Ayub Teaching Hospital, Abbottabad, from 1st May 2023 to 31st October 2023. A total of 207 women with singleton pregnancy, gestational age ≥ 36 weeks, were included in the study. Tablet Dinoprostone 3 mg was inserted in the posterior fornix vagina. Following application, the patient remained in a supine position for at least 15–30 minutes to prevent expulsion of the tablet. Cesarean delivery was performed in case of nonprogress of labour. Data was analysed with SPSS, with a *p-value* of the Chi-square test <0.05, which was considered statistically significant. **Results:** A total of 207 patients with a mean age of 29.087±2.69 years and gestational age of 39.531±1.19 weeks participated in the study. The success rate was seen in 178 patients (86%) after labour induction in women beyond 36 weeks of pregnancy. **Conclusion:** The effect of Dinoprostone on the IOL is promising. The optimal timing of offering IOL to women with beyond 36 weeks of pregnancy warrants further investigation, as does further exploration of the risk profiles of women and their values and preferences.

Keywords: Dinoprostone; beyond 36 weeks of pregnancy; induction; success rate; weight

✉**Corresponding author: Dr Komal Imtiaz,** MBBS, FCPS (Gynae and Obst), Department of Obstetrics and Gynaecology, King Abdullah Teaching Hospital Mansehra, Health Department KP Pakistan. **Cell:** +92-331-9814546 komalimtiaz40@gmail.com

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INTRODUCTION

Induction of Labour (IOL) is a commonly practised obstetrical intervention. About 20% of all births are caused by the prevalent practice of inducing labour, which is the intentional start of labour before its spontaneous commencement.[1] On the other hand, the misuse of Caesarean deliveries is a major worry nowadays.[2] IOL for some causes, especially in pregnancies beyond 36 weeks, seems even more crucial because it can reduce the risk of Caesarean section.[3]

Today, a variety of techniques are employed to encourage the IOL, such as pharmacological medications (prostaglandins such as Dinoprostone PGE2, misoprostol PGE1, mifepristone, or oxytocin) and mechanical techniques (membrane stripping or sweeping, cervical balloon, amniotomy).[4] In patients with a favourable cervix, oxytocin is traditionally used to induce labour. However, Prostaglandin is effective in inducing labour and cervical softening when there is an unfavourable cervix (low Bishop score).[5] Numerous prospective trials have tested prostaglandin analogues at various doses and methods of administration alone or in combination with oxytocin, a placebo, or one another. [6,7]

The safest method for inducing labour in an unscarred uterus with an unfavourable cervix is to utilise a Dinoprostone vaginal tablet. By raising levels of collagenase, elastase, glycosaminoglycan, ciermatan phosphate, and hyaluronic acid, prostaglandins change the extracellular ground material of the cervix.[8] Uterine contractions begin when the cervix's smooth muscle relaxes and gap junctions develop.[8] In accordance with the suggested procedure, a maximum of two dosages spaced six hours apart are administered, with 3 mg of each dose maintained in the vaginal posterior fornix. The effectiveness of Prostaglandin Dinoprostone in successfully inducing labour in women presenting with beyond 36 weeks of pregnancies was 84%, according to Madhavi KN et al.[9]

Although the results of the aforementioned study are excellent, there is still a practical gap with the use of prostaglandin Dinoprostone to induce labour in the Pakistani pregnant cohort. Thus, this study aims to assess the success rate of prostaglandin Dinoprostone in inducing labour in women presenting with more than 36 weeks of pregnancy. Furthermore, despite finding the

success rate, the results help us safely lower the rate of primary cesarean births.

MATERIAL AND METHODS

This descriptive cross-sectional study was conducted in the Department of Obstetrics and Gynaecology, Ayub Teaching Hospital, Abbottabad, from 1st May to 31st October 2023. A total sample size of 207 was calculated using WHO software with a confidence level of 95%, the anticipated proportion of efficacy of Dinoprostone = 84%[10] and absolute precision = 5%. Patents were chosen on non-probability consecutive sampling. Women aged 18–35 years old with singleton pregnancy confirmed on ultrasound, gestational age >36 weeks on LMP, and any parity were included in the study. However, those who had a history of more than one cesarean section, placenta previa or IUGR (assessed on USG) and refused informed consent were excluded.

The institutional review board approved the study protocol. After screening and informed consent, patients were included in the study. Tablet Dinoprostone 3 mg was inserted in the posterior fornix of the vagina. Following application, the patient remained in a supine position for at least 15–30 minutes to prevent expulsion of the tablet and waited for deliveries for 24 hours. All the administrations were given by the consultant gynaecologist, who had 3 years of post-fellowship experience. Data was recorded on a prescribed pre-formed proforma by the principal author.

Cesarean delivery was performed in case of foetal distress, nonprogress of labour, and failure of induction with/without chorioamnionitis (Intrapartum temperature >100.4°F or >37.8°C (by thermometer), tachycardia (>120 beats/min), Foetal tachycardia (>160–180 beats/min), purulent or foul-smelling vaginal discharge and maternal leukocytosis (total blood leukocyte count >15,000–18,000 cells/μL) on laboratory test.

Data was analysed using the statistical analysis program (IBM-SPSS version 22). Mean±SD was presented for quantitative variables like age, gestational age, parity, and number of doses. Frequency and percentage were computed for qualitative variables like mode of delivery and success rate. Stratification was done with regard to age, gestational age, parity, and number of doses, with a success rate of IOL by using the chi-square test, with $p \leq 0.05$ considered statistically significant.

RESULTS

The mean age of the total 207 female patients was 29.087±2.69 years, and the mean gestational age was 39.531±1.19 weeks, Table-1. The majority of the patients undergo vaginal delivery 178(86%), as shown in Table-2. Stratification of success rate with respect to age, gestational age, parity, and number of doses are shown in Table-3.

Table-1: Demographic details of patients

Demographics	Mean±SD
Age in years	29.087±2.69
Gestational age in weeks	39.531±1.19
Parity	1.589±1.43
Number of doses	1.082±0.27

Table-2: Mode of deliveries and success rate of Prostaglandin Dinoprostone (n=207)

Variable	Frequency	Percentage
Mode of delivery		
Vaginal	178	86%
C-section	29	14%
Success rate		
Yes	178	86%
No	29	14%
Total	207	100%

Table-3: Stratification of success rate versus demographic variables (n=207)

Variable	Success rate		*p*
	Yes (n=178	No (n=29)	
Age group			
18–27	24 (13.5%)	3 (10.3%)	0.642
28–35	154 (86.5%)	26 (89.7%)	
Parity			
0–3	161 (90.4%)	25 (86.2%)	0.483
>3	17 (9.6%)	4 (13.8%)	
Number of doses			
1	165 (92.7%)	25 (86.2%)	0.238
>1	13 (7.3%)	4 (13.8%)	

P<0.05

DISCUSSION

The success rate of IOL, particularly in early or full-term pregnancies, determines the fate of natural or cesarean delivery. This study found a striking success rate, i.e., of 86% in 178 post-term patients. This is very important as the fear of cesarean is effectively reduced, promoting the good well-being of mothers.

The overall success rate of IOL with Dinoprostone aligns with previous studies, which report vaginal delivery rates following Dinoprostone induction ranging from 55.6% to 86%.[10] This variability in success rates across different populations may be influenced by factors such as maternal characteristics, cervical status, and healthcare facility access. The 14(29%) Cesarean section rate in our study was primarily due to failed induction, particularly foetal distress, 'mothers' fears, and other unfavourable conditions.

Different authors have found a variable success rate of IOL with different methods. In our study, we used Prostaglandin Dinoprostone. Close to our study, Madhavi KN *et al,* showed that Prostaglandin Dinoprostone's success rate was 84% for successful IOL in women.[9] Another local study by Khan QM *et al,* showed that the success of Prostaglandin Dinoprostone gel was 65.5% for successful IOL.[11] Thomas J *et al,*

found that vaginal Dinoprostone reduces the Cesarean section rate to about 10% ensuring its effectiveness in IOL.[12]

The successfulness of IOL with vaginal Dinoprostone varies with age group and parity. In our study, 154(86.5%) success was observed in 28–35 age groups and 161 (90.4%) with the first three parities. In accordance with this, Khan QM *et al,* in Pakistan, found a total of 35 cases with the success of IOL among patients aged less than 35 years, 28 cases with a nulliparous uterus, and 30 cases with first parity.[11] Taner GÜNA *et al,* from Turkey, in contrast, found that multiparity increases the success of Dinoprostone in IOL, whereas age does not affect the outcome.[13]

The optimal management of women beyond 36 weeks of pregnancy is controversial.[14] It was found in 9 non-randomised controlled trials that, overall, expectant management of pregnancy was associated with approximately 22% higher odds of cesarean delivery than elective IOL. Most of these studies were conducted in women at or beyond 39 weeks of gestation. In studies of women at or beyond 39 weeks of gestation, the evidence was rated as moderate because of the size of the studies and the consistency of the findings. Among women less than 39 weeks of gestation, three trials reported no difference in risk of cesarean delivery among women who were induced as compared to expectant management, but all of these trials were small, older, and of poor quality.[15] Other randomised controlled trials suggest that elective IOL at or above 39 weeks of gestation and beyond is associated with a decreased risk for cesarean delivery and meconium-stained amniotic fluid.[16]

Dr. Edward Bishop created a pelvic scoring system in the 1960s and determined that elective induction was effective in multiparous women with uncomplicated pregnancies at term based on clinical experience, with a score of >8.[17.] Numerous trials have been conducted to provide low-dose prostaglandin pessaries to patients for outpatient usage in an effort to increase the Bishop score.[18,19] These medications raise the likelihood of a normal delivery by considerably raising the Bishop score. Ripening agents for outpatient use were not used in this trial; nonetheless, the group with a gestational age of greater than 39 weeks had a higher Bishop score in relation to the delivery method. This serves as an indirect indication of improved delivery results.

CONCLUSION

The success rate of IOL with Dinoprostone in early or full term is quite high in our setup, particularly in multiparous pregnancies with later-age mothers. However, it is imperative to find a comparative study with beyond 36 weeks versus post-term pregnancies with indicators like the number of vaginal doses and duration from administering the dose till delivery.

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