Original Article

Preinduction Cervical Ripening - A Comparative Study Between Transcervical Foley's Catheter Versus Intracervical Prostaglandin E2 Gel

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Abstract

Background: Whether or whether labour induction is successful depends on the cervical condition at that time. Induction failure is predicted to occur at an unacceptably high rate in patients with poor Bishop scores. Cervical ripening, in any form, is the answer to lowering induction failure. The purpose of this study is to assess the safety and efficacy of transcervical Foley's catheters for cervical ripening in pregnant women with term gestations. **Material and Methods:** After 38 full weeks of pregnancy, n = 100 patients with a Bishop's score <4 and different induction indications were randomly assigned to receive either an intracervical prostaglandin E2 or a transcervical Foley's catheter (n = 50). In the Foleys group, the catheter was deflated and removed 12 hours after it was inserted, and the cervix was rescored to enhance the Bishop's score. After six hours, Bishop's score was reevaluated in the Dinoprostone group. For a maximum of three doses in a 24-hour period, the same PGE2 dose was repeated and reevaluated after six hours if the bishop score was low. **Results:** In both groups, the bishop score was zero hours. Bishop scores ranged from 0 to 2 for the majority of patients. Bishop scores in the PGE2 gel group (n = 28 cases) and Foley's group (n = 31 cases) varied from 0 to 2. The two groups did not differ statistically significantly. Only patients in the Dinoprostone group were reevaluated in accordance with protocol after six hours. At six hours, most patients in the Dinoprostone group have Bishop scores between five and seven. The bishop's score after twelve hours. 16 instances in the Dinoprostone group and 21 cases in Foley's group were not assessed since they were administered within 12 hours. **Conclusion:** According to the original cervical score, improvement in cervical score, success rate of induction, and induction delivery intervals, Foley's catheter works just as well as prostaglandin E2 gel for softening the cervical area before induction. The patients didn't mind using a Foley's tube or the prostaglandin gel.

Keywords: Induction, labour, intracervical prostaglandin E2 gel, transcervical Foley's catheter, and cervical ripening.

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Introduction

Twenty percent of all deliveries in obstetric practice involve the usual procedure of induction of labor.[1] When the pregnancy is not prolonged in a manner detrimental to the health of the expectant mother and the foetus, it generally obviates the necessity for a caesarean section and facilitates vaginal delivery. In 15% of cases, a weak cervix is the primary cause of an ineffective induction. Ripening fixes the adverse condition of the cervix during labor. The evidence that is currently available indicates that between 9.5% and 33.7% of all pregnancies are induced each year. At least 20% of expectant mothers need medical assistance in order to begin labor. From 9.5 percent in 1990 to 29.4 percent in 2019, In the US, labor induction became three times more common overall.[2] post-dated pregnancy, maternal issues (such as diabetes mellitus, renal disease, or hypertension), oligohydramnios, pre-labor rupture of membranes, intrauterine fetal mortality, logistical concerns, and other medical or obstetric issues are among the indications for labor induction. Women with some degree of hypertension after 37 weeks of pregnancy should be counselled for labour induction as it is associated with better mother outcome. After 34 weeks of pregnancy, elective delivery may reduce the risk of problems, severe hypertension, and the requirement for antihypertensive medication therapy in women with gestational hypertension or preeclampsia.[3-5] The approach used (e.g., induction between 38 and 39 weeks vs. expectant management) had no effect on delivery outcomes in women with gestational diabetes and no other maternal or foetal issues.[6-8] Foley's catheter, oral or vaginal PGE1, and posterior fornix prostaglandin E2 are commonly used for inducing labor. Transcervical foley catheters are the main non-pharmacological method used for cervical ripening and labor induction. The cervical OS dilatation score at pre-induction cervical ripening is improved more effectively with a transcervical Foley catheter. Women who spontaneously discharged their catheter had positive outcomes, including faster induction-to-delivery periods and a much lower percentage of surgical deliveries, according to research by Salim et al. [9] In addition to acting as chemotactic agents that encourage leukocyte and macrophage infiltration into

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the cervical stroma, prostaglandins primarily influence fibroblast activity. These invading cells are the source of several degradative enzymes and extracellular matrix alterations associated with ripening. It has been demonstrated that PGE2 increases the number of vaginal births within 24 hours without raising the rates of operational births.[10] It is currently the most widely used prostaglandin medication. However, PGE2's systemic absorption causes adverse effects like nausea and vomiting. Uterine hyperactivity may result from the onset of contractions, particularly in women with unfavourable cervixes. Nevertheless, there is currently insufficient information in this region of the nation to assess the effectiveness of intracervical PGE2 and transcervical foley catheters as preinduction cervical ripening agents. In order to compare the effectiveness of these two, this study was undertaken.

Materials and Methods

The Department of Obstetrics and Gynaecology at Government Maternity Hospital conducted this prospective comparative study. The study received institutional ethical approval. Following an explanation of the study's purpose in the local tongue, each participant provided written consent.

Criteria for Inclusion:

1. Women who are between 38 and 42 weeks pregnant
2. Pregnant ladies between the ages of 18 and 30
3. A single foetus
4. Presentation of the head
5. Unbroken membranes
6. Bishop receives a score below 6.

Exclusion Standards:

1. Foetal death within the uterus
2. Women who have previously experienced LSCS
3. Prelabour membrane rupture
4. Deception
5. Antepartum haemorrhage (vasa previa, placenta previa)
6. Any inconsistency with vaginal delivery
7. Hysterotomy/myomectomy scar, traditional scar

A total of 200 pregnant women cases were included in the study based on the inclusion and exclusion criteria. They were divided into two groups at random: 100 (Foley's catheter) and 100 (Dinoprostone; Prostaglandin E2 gel). A comprehensive medical, surgical, and obstetrical history was gathered at the time of study enrolment. In order to evaluate the bishop's score and rule out cephalopelvic disproportion, a vaginal examination was conducted. By asking about the most recent menstrual cycle, the gestational period was assessed. The ultrasound was used to assess the fetus's health, maturity, liquor volume, and gestational age. Non-stress test tracings were used to evaluate the foetal status. The blood samples were collected in order to perform baseline laboratory examinations.

Foleys group: The internal OS was used to introduce No. 16 Foley's catheter via the cervix while following all aseptic procedures. After that, thirty millilitres of distilled water were used to inflate it. After 12 hours, the catheter was removed and deflated, and Bishop's score was increased by rescoring the cervix.

After 12 hours, if the Bishop score had not improved, an evaluation was conducted. After 12 hours, a cervical evaluation was carried out if the catheter had spontaneously expelled, the membranes had spontaneously ruptured, or the patient had entered inactive labour. If Bishop's score did not improve after a day, the induction was deemed unsuccessful.

PGE2 group: After the cervix was exposed, 100 patients were given 0.5 mg of PGE2 (Dinoprostone) via a loaded syringe. The uterus was closely watched for hyperstimulation. Six hours later, Bishop's score was reevaluated. The same PGE2 dose was given again and reevaluated six hours later if the bishop score was low, for a maximum of three doses in a 24-hour period. For every patient, partogram was used to monitor both the mother and the foetus. Every six hours, the PGE2 group's Bishop score was assessed. Artificial membrane rupture was used during active labour to expedite delivery and record the fluid's colour. An oxytocin drip was started with 5 U in 500 ml of ringer lactate at a rate of 2 mu/min if the contractions during the active phase of labour were insufficient. The dosage was incrementally elevated every 30 minutes until three contractions occurred within a 10-minute interval, each lasting 45 seconds, reaching a maximum of 40 mu/min. A proforma was used to gather labour and delivery parameters, such as the time between induction and delivery, the number of patients in need of oxytocin augmentation, and the delivery method. Additionally assessed were fever, gastrointestinal problems, hyperstimulation, and postpartum haemorrhage. Meconium aspiration, APGAR scores at one and five minutes, the presence of dense meconium in the amniotic fluid, and foetal distress indicated by abnormal cardiotocography resulting in an urgent delivery, and transfer to the NICU were all assessed.

Statistical analyses: were carried out using Version 26.0 of IBM SPSS Statistics for Windows. IBM Corp. Armonk, NY. Continuous measurement results were displayed as Mean ± SD and categorical as Frequency (Percent). The Shapiro-Wilk test was used to evaluate the data's normality. To compare the variables between the groups, inferential statistics such as the independent t test and Chi-square were employed.

Results

According to the distribution of cases across age groups, 20% of cases were under the age of 20, 50% were between the ages of 21 and 25, which was the most prevalent age group of patients included in this study, and 30% were between the ages of 26 and 30. The Foley's catheter patients' mean age was 23.67±3.11 years, whereas the Dinoprostone group's mean age was 23.57±2.90 years. The p values were 0.814, indicating that the information presented in [Table 1] was not significant.

Table 1: Demographic profile of the cases included in the study

Age In Years	Foley's	Dinoprostone	Total
< 20	10	10	20
21 – 25	25	25	50
26 – 30	15	15	30
Total	50	50	100
Mean ± SD	23.67±3.11	23.57±2.90	

In this study, it was shown that 55% of cases in both groups fell between 40.1 and 42.0 weeks, whereas 45% of cases fell below 45 weeks. The Dinoprostone group's gestational age was 40.00±0.00 weeks, while Foley's groups were 39.85±0.57 weeks. This study revealed that 74% of the patients in each group were primigravida.

Table 2: Distribution of cases based on Gestational age

Gestational Age (weeks)	Foley's	Dinoprostone	Total
38.0 – 40.0	23	22	45
40.1 – 42.0	27	28	55
Total	50	50	100
Mean ± SD	39.85±0.57	40.00±0.00	

[Table 3] presents the various indications for induction utilised in the investigation. This study indicates that the predominant causes in both groups were postdated pregnancy (68%), gestational hypertension (13%), and oligohydramnios (10%).

Table 3: Indication for Induction in the cases of study

Indication	Foley's	Dinoprostone	Total
Post Dates	32	36	68
Oligohydramnios	6	4	10
Gestational Hypertension	7	6	13
Intra Uterine Growth Restriction	2	2	4
Rh Negative pregnancy	2	1	3
Pre-Eclampsia	1	1	2

In both groups, the Bishop score was zero hours. Bishop scores ranged from 0 to 2 for the majority of patients. Bishop scores varied from 0 to 2 in 31 occurrences within Foley's group and 28 cases in the PGE2 gel group. The two groups did not exhibit statistically significant differences. Only patients in the Dinoprostone group were reevaluated in accordance with protocol after six hours. At six hours, most patients in the Dinoprostone group have Bishop scores between five and seven. Bishop's score after 12 hours. In Foley's group, 21 instances and in the Dinoprostone group, 16 cases were delivered within 12 hours; therefore, they were not assessed. In both cohorts, the preponderance of patients exhibited a Bishop score ranging from 5 to 7. [Table 4] illustrates that the Dinoprostone group had a maximum of 4 instances with a Bishop Score ≥8, whereas the Foley group has just 1 case.

Table 4: Showing Bishop's score at various intervals in both groups

Bishop's Score	Foley's	Dinoprostone	p- value
Bishop's Score at 0 hours			
0 – 2	31	28	0.875
3	14	18	
4	5	4	
Bishop's Score at 6 hours			
Delivered	0	5	0.550
≤ 4	24	20	
5 - 7	16	21	
≥ 8	10	4	
Bishop's Score at 12 hours			
Delivered	21	16	0.027*
≤ 4	1	3	
5 - 7	15	19	
≥ 8	13	12	
Bishop's Score at 24 hours			
Delivered	49	44	0.018*
≤ 4	0	0	
5 - 7	0	6	
≥ 8	1	0	

* Significant

There were 35 vaginal births in the Foley's group and 31 in the Dinoprostone group. There was no discernible difference in the two groups' need for surgical intervention (LSCS). LSCS was conducted on n = 15 participants in Foley's group and n = 19 participants in the Dinoprostone group. The two groups did not exhibit statistically significant differences. Nine cases in the Foley group and ten instances in the Dinoprostone group had lower segment caesarean section due to foetal discomfort. Additional indicators for LSCS comprise a non-reactive non-stress test (n = 2 instances in the Foley group and n = 6 instances in the Dinoprostone group) and failure to advance (n = 4 instances in the Foley group and n = 3 instances in the Dinoprostone group).

[Table 5] indicates a statistically significant disparity in the induction delivery interval between the two groups (p=0.027). The predominant number of patients in both cohorts experienced an induction delivery interval of 7 to 12 hours. Foley's group has 26 cases, whereas the Dinoprostone group has 20 cases.

Table 5: Induction to Delivery Interval the cases of study

Induction Delivery Interval (hours)	Foley's	Dinoprostone	Total
0 – 6	4	7	11
7 – 12	26	20	46
13 – 18	17	8	25
19 – 24	3	15	18
Total	50	50	100
Mean ± SD	13.72 ± 6.53	12.01 ± 3.99	

Nine infants in the Foley group and ten newborns in the Dinoprostone group required admission to the NICU. The neonatal morbidity in both groups was not statistically significant. Eight percent of children in both cohorts had hyperbilirubinemia, whereas four percent of infants in Foley's cohort and five percent of infants in the Dinoprostone cohort experienced birth asphyxia. Three percent of Foley's cohort and four percent of the Dinoprostone cohort experienced meconium aspiration. In both groups, 2% of the infants were admitted for observation. In the Dinoprostone group, 2% of cases had postpartum hemorrhage, while in Foley's group, 2% had puerperal pyrexia and 4% had postpartum hemorrhage.

Discussion

In this study, between 38 and 42 weeks of gestation, 100 women between the ages of 18 and 30 were randomly assigned to have pre-induction cervical ripening using prostaglandin E2 gel and Foley's catheter. The PGE2 (Dinoprostone) group had a mean age of 23.57 ± 2.90 years, while the Foley's group had a mean age of 23.67 ± 3.11 years. The mean ages of the two groups were 22.9 ± 4.1 and 23.5 ± 5.6 years, respectively, according to M. Ezimokhai et al. [11] In a related investigation, Ghezzi F et al,[12] discovered that PGE2 was 26.2 ± 3.3 years old and Foley's group was 26.1 ± 2.8 years old. The majority of patients in the current study, or 55% of both the Foley's group and the PGE2 gel group, had gestational ages between 40.1 and 42.0 weeks. Furthermore, M. Ezimokhai et al. [11] found that the two groups' gestational ages were 40.0 ± 1.9 weeks and 40.6 ± 1.1 weeks, respectively. According to Deshmukh et al,[13] the PGE2 group's mean gestational age was 38.6 ± 1.68 weeks, while Foley's groups was 38.7 ± 1.73 weeks. Out of all patients, only 3% of those in Foley's group and 2% of those in the PGE2 group—who had gestational ages of 40.1–42 weeks and 42.1–43 weeks, respectively—met the criteria for a prolonged pregnancy (>42 weeks). By hospital rules, all women who have been pregnant for more than 40 weeks must go through induction. Hypertension caused by pregnancy was the cause in 14% and 12% of the cases, respectively. A study by St. Onge RD et al,[14] found that oligohydramnios (42% of cases) led to induction in the PGE2 group and pregnancy-induced hypertension (47% of cases) in the catheter group. For this study, Bishop's score before induction was 2.39 ± 0.88 for Foley's group and 2.37 ± 0.91 for PGE2. Sciscione et al,[15] found mean preinduction bishop's scores of 2.8 ± 1.7 and 2.4 ± 1.3 in a comparable investigation, which is in line with the results of this study. For Foley's group and the PGE2 gel group, the mean post-induction score at 12 hours was 6.32 ± 1.75 and 6.91 ± 1.21, respectively. Statistical significance is indicated by the post-induction Bishop score's p value of 0.037. The present study's findings align with those of M. Ezimokhai et al,[11] Ghezzi F. et al. [12] and Deshmukh et al. [13] After 12 and 24 hours, a significant change in Bishop's score was discovered. Nevertheless, there was no indication that one approach was superior than the other in the comparison of the groups. The results of St. Onge RD et al,[14] and Deshmukh et al,[13] were similar to those of Dahiya K et al.'s study,[16] which also showed that Bishop's scores changed in a manner similar to this study after six hours (4.6 ± 1.48 in PGE2 group and 4.18 ± 1.81 in Foley's group). 66% of mothers delivered their babies vaginally. 70% in Foley's group and 62% in the PGE2 gel group. The total rate of caesarean sections was 34%, with 30% occurring in Foley's group and 38% in the PGE2 gel group. The p-value is 0.299, which indicates statistical insignificance. The findings of this investigation were comparable to those of Ghezzi F et al,[12] and Deshmukh et al. [13] The PGE2 gel group's mean birth weight was 2.88 ± 0.26, while Foley's group was 2.91 ± 0.35. Similar findings were reported by Ghezzi F et al,[12] and Deshmukh et al. [3] With a P value of 0.027, the induction delivery interval is 12.01 ± 3.99 in the PGE2 gel group and 13.72 ± 6.53 in Foley's group. Although there is not much difference between the two groups, the induction delivery interval between these two groups is statistically significant, with a p value <0.05 (0.027). Similar results were observed by Deshmukh et al,[13] and Ghezzi F et al,[12] in their individual studies.

Conclusion

Foley's catheter is a useful method for pre-induction cervical ripening as Prostaglandin E2 gel in terms of the initial cervical score, improvement in cervical score, induction success, and induction delivery intervals, according to the limitations of this study. The patients found both the prostaglandin gel and the Foley's catheter to be equally satisfactory. In this trial, no patient experienced an unintentional rupture of their membranes. Dinoprostone must be refrigerated between 6 and 8 degrees Celsius. When PGE2 is contraindicated, women with asthma can safely utilise Foley's catheter.

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Conflicts of interest

There are no conflicts of interest.

References

1. Devarasetty S, Habeebullah S. Induction of Labour: A Review. J Basic Clin Appl Health Sci 2019; 2(4):128–133.
2. Martin JA, Hamilton BE, Osterman MJK, Driscoll AK. Births: Final Data for 2019. Natl Vital Stat Rep. 2021; 70(2):1-51.
3. Churchill D, Duley L, Thornton JG, Jones L. Interventionist versus expectant care for severe preeclampsia between 24-34 weeks gestation. Cochrane Database Syst Rev. 2013; 26 ;(7):CD003106.
4. Koopmans CM, Bijlenga D, Groen H et al. Induction of labor versus expectant monitoring for gestational hypertension or mild preeclampsia after 36 weeks gestation (HYPITAT): a multicentre, open-label randomized controlled trial. Lancet, 2009; 374(9694):979-988.
5. Wang Y, Hao M, Sampson S, Xia J. Elective delivery versus expectant management for preeclampsia: A meta-analysis of RCTs. Arch Gynecol Obstet.2017; 295(3):607-622.
6. Alberico S, Erenbourg A, Hod M, et al. Immediate delivery or expectant management in gestation diabetes at term: the GINEXMAL randomized controlled trial. BJOG 2017; 124(4):669-77.
7. Biesty LM, Egan AM, Dunne F, et al. Planned birth at or near term for improving health outcomes for pregnant women with gestational diabetes and their infant. Cochran Database Syst Rev 2018; 1: CD012910.
8. Boulvian M, Irion O, Dowswell T, Thornton JG. Induction of labor at or near term for suspected fatal macrosomia. Cochrane Database of System Rev 2016; 22(5):CD000938.
9. Salim R, Zafran N, Nachum Z, Garmi G, Kraiem N, Shalev E. Single-balloon compared with double-balloon catheters for induction of labor: a randomized controlled trial. Obstet Gynecol. 2011;118(1):79–86.
10. Dalui R, Suri V, Ray P. Comparison of extra amniotic foley catheter and intracervical prostaglandin E gel for preinduction cervical ripening; Aeta Obstet Gynecol Scand, 2005; 84(4) 362-67.
11. Ezimokhai M, Nwabineli JN. The use of Foley's catheter in ripening the unfavourable cervix prior to induction of labour. Br J Obstet Gynaecol. 1980; 87(4):281-86.
12. Ghezzi F, Massimo F, Raio L, Di Naro E, Balestreri D, Bolis P. Extra-amniotic Foley catheter and prostaglandin E2 gel for cervical ripening at term gestation. Eur J Obstet Gynecol Reprod Biol. 2001; 97(2):183-87.
13. Deshmukh VL, Yelikar KA, Deshmukh AB. Comparative Study of Intra-cervical Foley's Catheter and PGE (2) Gel for Pre-induction Ripening (Cervical). J Obstet Gynaecol India. 2011; 61(4):418-21.
14. St Onge RD, Connors GT. Preinduction cervical ripening: A comparison of intracervical prostaglandin E2 gel versus Foley catheter. Am J Obstet Gynecol. 1995; 172:687-90.
15. Sciscione AC, McCullough H, Manley JS, Shlossman PA, Pollock M, Colmorgen GH. Am J Obstet Gynecol.1999;180(1):55-60.
16. Dahiya K, Malik K, Dahiya A, Nanda S. Comparison of the efficacy of Foley catheter balloon with dinoprostone gel for cervical ripening at term. Int J Clin Med. 2012;3(6):527-31.