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Comparing Effectiveness of Dinoprostone Gel and Single Foley's Catheter for Medical Termination of Pregnancy with Previous Caesarean Scar

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KEYWORDS

Termination of pregnancy, Dinoprostone gel, Foley's catheter.

ABSTRACT:

Women who have had a previous caesarean scar and are undergoing medical termination of pregnancy (MTP) have shown encouraging results from both chemical induction with Dinoprostone gel and mechanical induction of labour with Foley's catheter. T o assess and contrast the efficacy of a single Foley's catheter and Dionoprostone gel for medical termination of pregnancy (MTP) in patients who have had a prior caesarean section. The Department of Fetomaternal Medicine at BMU, Dhaka, carried out this quasi-experimental study from December 2023 to November 2024. The study population consisted of all patients with a history of caesarean scarring during the study period who were listed for medical termination of pregnancy within 14–28 weeks of gestation. A purposive sampling method was used to select 60 participants, who were assigned to Group A (single Foley's catheter = 30) and Group B (Dinoprostone gel = 30). The collected data was evaluated for accuracy, consistency, and completeness prior to analysis. To analyse the data, SPSS version 23.0 was used. Among 60 participants, baseline demographics were comparable between Group A (Dinoprostone, n=30) and Group B (Foley's, n=30): age 18–34 years in 27 (90.0%) each (p=0.715), SSC–HSC education in 12 (40.0%) each (p=0.199). Comorbidities like DM [Group A: 10 (33.3%), Group B: 9 (30.0%)], and HTN [9 (30.0%) vs 6 (20.0%)] were similar. Induction success was higher in Group A: 28 (93.3%) vs 19 (63.3%) (p=0.004). Time to labor and delivery was shorter in Group A: 16.1 ± 6.6 hrs vs 23.3 ± 8.6 (p=0.001); 24.8 ± 7.1 hrs vs 31.2 ± 9.3 (p=0.004). Hospital stays <3 days: 18 (60.0%) vs 9 (30.0%) (p=0.019). Dinoprostone gel was more effective and time-efficient than a single Foley's catheter for pregnancy termination in women with cesarean scars, with higher success rates and shorter hospital stays, without increasing maternal complications.

Introduction

Medical termination of pregnancy (MTP) in women with previous caesarean delivery presents unique clinical challenges requiring careful management approaches. With global caesarean section rates continuing to increase, reaching 21.1% worldwide, the population of women requiring MTP with scarred uteri is growing proportionately. Recent data indicate that up to 7% of all pregnancy terminations occur in women

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with prior caesarean delivery,[1] emphasizing the clinical significance of optimizing termination protocols for this specific high-risk group. The selection of appropriate cervical ripening methods must balance efficacy with safety considerations unique to the scarred uterus.

Women with previous caesarean scars face elevated risks during MTP, including uterine rupture, abnormal placentation, excessive hemorrhage, and incomplete termination.[2] It is especially concerning that using pharmacological methods increases the risk of uterine rupture, as reported by Morlando et al.[3]. The thin myometrium at the caesarean scar site, often measuring less than 1cm as noted by Xiao et al.[4], creates a vulnerable zone with reduced tensile strength. These anatomical and physiological alterations necessitate careful selection of cervical ripening methods that minimize mechanical and biochemical stress on the scarred lower uterine segment.

Current approaches to cervical ripening in women with previous caesarean scars include pharmacological agents (prostaglandins) and mechanical methods (balloon catheters). Each method offers distinct advantages and potential risks, with recent literature suggesting varied efficacy and safety profiles in the context of scarred uteri.

Dinoprostone (prostaglandin E2) promotes cervical ripening through collagen breakdown in the cervical stroma and increasing myometrial contractility. López-Jiménez et al.[5] observed favorable cervical ripening outcomes with dinoprostone in women with previous caesarean scars when used under careful monitoring protocols. A systematic review by Yokoyama and Suzuki[6] demonstrated effective cervical ripening within 24 hours using dinoprostone vaginal inserts. Nonetheless, there are still worries about uterine hyperstimulation because some research indicates that women with scarred uteri have higher rates of uterine tachysystole when compared to mechanical techniques.[7] These safety concerns have prompted exploration of alternative cervical ripening methods for this high-risk population.

The Foley catheter works mechanically by applying direct pressure to the internal cervical os while stimulating endogenous prostaglandin release from the decidua. Recent research demonstrates promising safety profiles for mechanical methods in women with scarred uteri. Yogamoorthy et al.[8] reported successful cervical ripening using Foley catheters with no instances of uterine rupture in a cohort of women with previous caesarean scars. Ma et al.[9] observed vaginal delivery rates of 50-64% following Foley catheter-induced cervical ripening in women with previous caesarean sections, suggesting both safety and efficacy. The mechanical nature of cervical dilation, as highlighted by Sanchez-Ramos[1], may theoretically reduce the risk of uterine hyperstimulation at the vulnerable scar site.

Despite the availability of both methods, direct comparative studies specifically examining dinoprostone gel versus Foley catheter in women with previous caesarean scars are limited. While individual studies on each method exist, methodological heterogeneity makes direct comparison challenging. Recent systematic reviews have identified this specific knowledge gap,[10,11] noting that "data on optimal cervical ripening methods for women with prior caesarean delivery remains insufficient". This study aims to address this critical gap by providing direct comparative evidence to guide evidence-based clinical practice for this growing patient population.

This study aims to directly compare the effectiveness and safety of dinoprostone gel versus single Foley's catheter for medical termination of pregnancy in women with previous caesarean scars. The primary objective is to evaluate successful termination rates within 24 hours of initiation. Secondary objectives include assessment of time to termination, need for additional interventions, patient discomfort, and safety parameters including uterine rupture, hemorrhage, and infection rates.

MATERIALS AND METHODS:

This quasi-experimental study was carried out on indoor patients at the Department of Fetomaternal Medicine, BMU, Dhaka and spanned one year following protocol approval, with an extensive literature review initiated at the study's commencement. The study population included patients admitted for medical termination of pregnancy between 14 and 28 weeks of gestation with a history of one cesarean section. Gestational age was determined based on the first day of the last menstrual period or first-trimester ultrasound dating. Inclusion criteria were: 1) women with 14–28 weeks of

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pregnancy and prior cesarean section, coupled with severe maternal conditions (e.g., preeclampsia with severe features, congenital heart disease with pulmonary hypertension, chronic kidney disease), 2) fetal anomalies (e.g., beta thalassemia major, chromosomal abnormalities confirmed via amniocentesis or chorionic villous sampling), and 3) voluntary consent from patients and legal guardians. Exclusion criteria encompassed abnormal placentation (e.g., placenta previa), a history of ≥2 cesarean deliveries, prior classical cesarean or myomectomy, hemorrhagic disorders, liver disease, active labor, or uterine scar tenderness.Patient selection commenced according to inclusion and exclusion criteria, and all patients were informed about the two interventions. As randomization and blinding were not possible, participant's informed consent was necessary. After participant selection, informed consent was obtained from the patient's nearest relative's decision-maker. Patients were purposefully divided into two intervention groups based on their preferred method: a single-balloon catheter group (n = 30) and a dinoprostone group (n = 30). Demographic data, including age, diagnosis, educational level, and medical history, were recorded at baseline.

In Group A, a 16-F Foley's catheter was introduced into the cervix using long artery forceps, and the balloon was filled with 40 mL of normal saline. The catheter was placed over the internal os, attached to the inner thigh, and taken out 24 hours later or when the membrane burst. In Group B, patients received an intracervical PGE2 slow-release vaginal insert (Cerviprime gel containing 0.5 mg dinoprostone); if their Bishop's score did not improve after 6 hours, a second dose was given. We tracked labour progress, scar tenderness, and maternal vital signs for both groups. Vaginal examination was performed after catheter expulsion or 6 hours post-dinoprostone insertion, and cervical dilatation/effacement were assessed. Oxytocin augmentation (administered at 10 units/1000 mL Ringer lactate, 8–40 mL/hour) was used as needed. Pain levels were evaluated via a visual analog scale (0–10). The primary outcome was the induction-to-delivery interval, while secondary outcomes included success rates, surgical interventions (e.g., hysterectomy), and complications (e.g., hemorrhage). Fetal weight was measured, placental completeness was examined, and side effects were monitored for 12 hours postpartum. If the Foley catheter was not expelled within 48 hours, balloons were deflated and the catheter was withdrawn.

Operational definition

Medical termination of pregnancy

Medical termination of pregnancy (MTP), commonly known as medical abortion, is a procedure used to terminate a pregnancy with the use of medications rather than surgical intervention.

Second trimester of pregnancy

Defined as the period between 14th and 28th week of pregnancy

Abortion[12]

Pregnancy termination before the foetus is typically viable outside the uterus, which is before 24 weeks of gestation.

Induction to abortion/delivery interval

It is the amount of time between the implantation of a catheter or the application of Dinoprostone gelup and the fetus's delivery.

Failure of induction[13]

Failed induction will have defined as removal of Foley's catheter after 48 h. of insertion without change of Bishop's Score or failure to enter into active labourafter 12 hrs of last dose of Dinoprostone gel.

Adverse effects

Any complications such as uterine rupture, excessive vaginal bleeding, or skin tenderness that develop after beginning induction regimens will be regarded as negative effects for both groups.

Labour

The clinical diagnosis of labour is defined by progressive cervical effacement and dilatation, as well as evidence of frequent, painful uterine contractions that are getting worse in frequency, duration, and intensity.

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Statistical analysis:

IBM SPSS Statistics version 27.0 (IBM Corp., Armonk, NY, USA) was used for the statistical analysis. Descriptive statistics were used to summarize categorical variables as frequencies and percentages, while continuous variables were expressed as means with standard deviations or medians with ranges. The Chi-square test and Fisher's exact test were applied to compare categorical variables between Group A (Dinoprostone gel) and Group B (Single Foley's Catheter), depending on expected cell counts. For continuous variables, the Independent samples t-test or Mann-Whitney U-test was used based on the normality of distribution. Statistical significance was defined as a p-value (less than 0.05). This approach ensured a reliable comparison between the two groups across demographic, clinical, and outcome measures.

Results

Table 1: Baseline demographic characteristics of study population (n=60)

Characteristics	**Group A (n=30)**		**Group B (n=30)**		***p* value**
	n	**%**	**n**	**%**	
Age (in years)					
18-25	14	46.7	11	36.7	
26-34	13	43.3	16	53.3	0.715^{ns}
35-40	3	10.0	3	10.0	
Level of education					
Below SSC	6	20.0	10	33.3	
SSC up to HSC	12	40.0	12	40.0	0.199^{ns}
Up to honours level	6	20.0	7	23.4	
Above honours level	6	20.0	1	3.3	
Occupation					
Employee	12	40.0	4	13.3	
Housewife	13	43.3	21	70.0	0.072^{ns}
Student	4	13.3	5	16.7	
Others	1	3.3	0	0.0	
Monthly income (in taka)					
10,000-25,000	13	43.3	10	33.3	0.425^{ns}
>25,000	17	56.7	20	66.7	

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Data presented as frequency and percentage over the columns.

ns=not significant

P value reached from Chi-square test

Group A= Dinoprostone gel

Group B= Single Foley's Catheter

The baseline demographic characteristics of the study population (n=60) showed no statistically significant differences between Group A (Dinoprostone gel, n=30) and Group B (Single Foley's Catheter, n=30) across various parameters. Age distribution was similar, with the majority aged 18-34 years in both groups (Group A: 27/30, 90%; Group B: 27/30, 90%; p=0.715). Educational attainment did not differ significantly, with a higher proportion in both groups having education up to SSC-HSC levels (Group A: 12/30, 40%; Group B: 12/30, 40%; p=0.199). Regarding occupation, housewives constituted the largest subgroup in both groups (Group A: 13/30, 43.3%; Group B: 21/30, 70%; p=0.072), and income levels showed no significant difference (Group A: 17/30, 56.7% earning >25,000 Taka; Group B: 20/30, 66.7%; p=0.425). These findings suggest comparable baseline demographic characteristics, supporting the validity of subsequent outcome comparisons between the two groups.

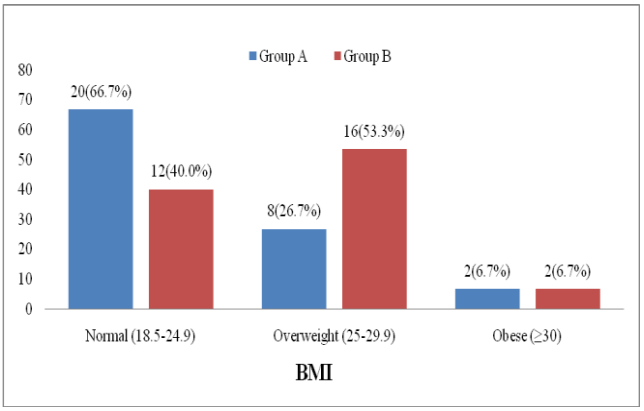

Figure 1: Distribution of the participants according to BMI

Table 2: Distributions of the study participants according to comorbidity (n=60)

Comorbidities	Group A (n=30)		Group B (n=30)		*p* value
	n	%	n	%	
DM					
Yes	10	33.3	9	30.0	[a]0.781[ns]
No	20	66.7	21	70.0	
HTN					
Yes	9	30.0	6	20.0	[a]0.371[ns]
No	21	70.0	24	80.0	
Thyroid disease					
Yes	6	20.0	6	20.0	[a]1.00[ns]
No	24	80.0	24	80.0	
COPD					
Yes	4	13.3	1	3.3	[b]0.150[ns]

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No	26	86.7	29	96.7	
Others					
Yes	7	23.3	12	40.0	[a]0.156[ns]
No	23	76.7	18	60.0	

ns=not significant

[a]P value reached from Chi-square test

[b]P value reached from Fisher's exact test

The distribution of comorbidities among study participants showed no statistically significant differences between Group A (Dinoprostone gel, n=30) and Group B (Single Foley's Catheter, n=30) across all examined conditions. Diabetes mellitus (DM) was present in 10 (33.3%) participants in Group A and 9 (30.0%) in Group B (p=0.781), while hypertension (HTN) was reported in 9 (30.0%) in Group A and 6 (20.0%) in Group B (p=0.371). Thyroid disease affected an equal number of participants in both groups, 6 (20.0%) each (p=1.00). Chronic obstructive pulmonary disease (COPD) was more frequent in Group A, with 4 (13.3%) participants compared to 1 (3.3%) in Group B, though this difference was not statistically significant (p=0.150). Other comorbidities were reported in 7 (23.3%) participants in Group A and 12 (40.0%) in Group B (p=0.156). These findings suggest comparable distributions of comorbidities between the two groups, reinforcing the reliability of further comparisons of outcomes.

Table 3: Distributions of the study participants according to pregnancy status (n=60)

Pregnancy status	**Group A (n=30)**		**Group B (n=30)**		***p* value**
	n	**%**	**n**	**%**	
Gravida					
2[nd]	18	60.0	13	43.3	
3[rd]	8	26.7	5	16.7	0.092[ns]
4[th]	4	13.3	9	30.0	
5[th]	0	0.0	3	10.0	
Parity					
1	21	70.0	18	60.0	0.416[ns]
≥2	9	30.0	12	40.0	
Gestational age					
14-20 weeks	3	10.0	6	20.0	
21-24 weeks	9	30.0	9	30.0	0.529[ns]
25-28 weeks	18	60.0	15	50.0	
Ultrasound findings					

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Multiple congenital anomaly	11	36.7	9	30.0	
Single lethal anomaly of fetus	9	30.0	11	36.7	0.891[ns]
PE with severe feature with AFI	7	23.3	6	20.0	
IUD	3	10.0	4	13.3	

ns=not significant

P value reached from Chi-square test

The pregnancy status of study participants showed no statistically significant differences between Group A (Dinoprostone gel, n=30) and Group B (Single Foley's Catheter, n=30) across all examined parameters. Regarding gravida, most participants were in their 2nd pregnancy in both groups (Group A: 18/30, 60.0%; Group B: 13/30, 43.3%; p=0.092), while higher-order pregnancies (4th and 5th) were slightly more frequent in Group B (12/30, 40.0%). Parity distributions were similar, with primiparous participants accounting for the majority (Group A: 21/30, 70.0%; Group B: 18/30, 60.0%; p=0.416). Gestational age at termination was comparable, with most participants being 25-28 weeks pregnant (Group A: 18/30, 60.0%; Group B: 15/30, 50.0%; p=0.529). Ultrasound findings showed similar frequencies of multiple congenital anomalies (Group A: 11/30, 36.7%; Group B: 9/30, 30.0%) and single lethal anomalies (Group A: 9/30, 30.0%; Group B: 11/30, 36.7%; p=0.891). These results indicate no significant differences in pregnancy status between the two groups, supporting balanced comparisons of their outcomes.

Table 4: Distributions of the study participants according to indication for medical termination of pregnancy (n=60)

Indication for termination	**Group A (n=30)**		**Group B (n=30)**		***p* value**
	n	**%**	**n**	**%**	
Congenital anomaly	18	60.0	17	56.7	
Maternal PE with severe feature	7	23.3	6	20.0	
Maternal heart disease	0	0.0	1	3.3	0.875[ns]
Fetus with β thalassemia major/ single chain disorder	1	3.3	1	3.3	
IUD	4	13.3	5	16.7	

ns=not significant

P value reached from Chi-square test

The indications for medical termination of pregnancy were similar between Group A (Dinoprostone gel, n=30) and Group B (Single Foley's Catheter, n=30), with no statistically significant differences observed (p=0.875). Congenital anomalies were the most common indication in both groups (Group A: 18/30, 60.0%; Group B: 17/30, 56.7%). Maternal preeclampsia with severe features was reported in 7 (23.3%) participants in Group A and 6 (20.0%) in Group B. Rare indications such as maternal heart disease were present

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in only 1 (3.3%) participant in Group B, while fetal β-thalassemia major or single chain disorders were reported in 1 (3.3%) participant in each group. Intrauterine death (IUD) accounted for 4 (13.3%) cases in Group A and 5 (16.7%) in Group B. These findings highlight similar distributions of indications for pregnancy termination across the two groups.

Table 5: Comparison of induction of labour between two groups (n=60)

Failed induction	**Group A (n=30)**		**Group B (n=30)**		***p* value**
	n	**%**	**n**	**%**	
Failed	2	6.7	11	36.7	0.004[s]
Successful	28	93.3	19	63.3	

s= significant

P value reached from Fisher's exact test

The comparison of induction of labour between Group A (Dinoprostone gel, n=30) and Group B (Single Foley's Catheter, n=30) revealed a statistically significant difference (p=0.004). Failed induction was significantly lower in Group A, with only 2 (6.7%) participants experiencing failure compared to 11 (36.7%) in Group B. Conversely, the success rate was markedly higher in Group A (28/30, 93.3%) compared to Group B (19/30, 63.3%). These findings indicate that Dinoprostone gel is significantly more effective than Single Foley's Catheter for induction in medical termination of pregnancy among participants with previous cesarean scars.

Table 6: Comparison of intra-partumoutcome between two groups (n=60)

Parameter	**Group A (n=30)**		**Group B (n=30)**		***p* value**
	n	**%**	**n**	**%**	
Time from induction to active labor (hrs)					
Mean±SD	16.1±6.6		23.3±8.6		
Median (min-max)	15(6-28)		25.5(11-36)		[a]0.001
Time from induction to delivery (hrs)					
Mean±SD	24.8±7.1		31.2±9.3		[b]0.004
Median (min-max)	24(12-38)		31(16-46)		
Cervical dilation after induction					
1.5-3 cm	9	30.0	5	16.7	[c]0.459[ns]

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4-6 cm	15	50.0	17	56.7	
>6 cm	6	20.0	8	26.6	
Patients requiring oxytocin administration					
Yes	21	70.0	20	66.7	[c]0.781[ns]
No	9	30.0	10	33.3	

s= significant

ns=not significant

[a]P value reached from Mann Whitney U-test

[b]P value reached from Independent t-test

[c]P value reached from Chi-square test

The intra-partum outcomes demonstrated significant differences between Group A (Dinoprostone gel, n=30) and Group B (Single Foley's Catheter, n=30) in terms of time intervals but not in other parameters. Time from induction to active labor was significantly shorter in Group A (mean ± SD: 16.1 ± 6.6 hours; median: 15 hours) compared to Group B (mean ± SD: 23.3 ± 8.6 hours; median: 25.5 hours; p=0.001). Similarly, time from induction to delivery was significantly reduced in Group A (mean ± SD: 24.8 ± 7.1 hours; median: 24 hours) compared to Group B (mean ± SD: 31.2 ± 9.3 hours; median: 31 hours; p=0.004). Cervical dilation after induction did not differ significantly between groups, with most participants achieving 4-6 cm dilation (Group A: 15/30, 50.0%; Group B: 17/30, 56.7%; p=0.459). Additionally, the proportion of patients requiring oxytocin administration was comparable between groups (Group A: 21/30, 70.0%; Group B: 20/30, 66.7%; p=0.781). These findings suggest that Dinoprostone gel facilitates a faster progression to delivery but achieves similar cervical outcomes and oxytocin requirements compared to Single Foley's Catheter.

Table 7: Comparison of intra-partumcomplication between two groups (n=60)

Parameter	**Group A (n=30)**		**Group B (n=30)**		***p* value**
	n	**%**	**n**	**%**	
Need for hysterotomy/laparotomy					
Yes	1	3.3	0	0.0	0.500[ns]
No	29	96.7	30	100.0	
Uterine rupture					
Yes	1	3.3	0	0.0	0.500[ns]
No	29	96.7	30	100.0	
Surgical evacuation					
D & C	2	6.7	2	6.7	0.388[ns]

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Not needed	28	93.3	28	93.3	

ns=not significant

P value reached from Fisher's exact test

The intra-partum complications showed no statistically significant differences between Group A (Dinoprostone gel, n=30) and Group B (Single Foley's Catheter, n=30) across all parameters. The need for hysterotomy/laparotomy was reported in only 1 (3.3%) participant in Group A, compared to none in Group B (p=0.500). Similarly, uterine rupture occurred in 1 (3.3%) participant in Group A and none in Group B (p=0.500). Surgical evacuation via dilation and curettage (D&C) was required in 2 (6.7%) participants in Group A and 2 (6.7%) in Group B, with no significant difference (p=0.388). These findings indicate that both methods are associated with comparable and low rates of intra-partum complications, supporting their safety for medical termination of pregnancy in patients with previous cesarean scars.

Table 8: Comparison of postpartum outcome between two groups (n=60)

Parameter	**Group A (n=30)**		**Group B (n=30)**		***p* value**
	n	**%**	**n**	**%**	
Duration of vaginal delivery from induction					
Within 24 hours	20	66.7	9	30.0	[a]0.004[s]
After 24 to 48 hours	10	33.3	21	70.0	
Blood transfusion					
1 bag	5	16.7	4	13.3	[b]0.264[ns]
Not needed	25	83.3	26	86.7	
Total hospital stay					
<3 days	18	60.0	9	30.0	[a]0.019[s]
3-6 days	12	40.0	21	70.0	

s= significant

ns=not significant

[a]P value reached from Chi-square test

[b]P value reached from Fisher's exact test

The postpartum outcomes demonstrated a significant difference in the duration of vaginal delivery from induction between Group A (Dinoprostone gel, n=30) and Group B (Single Foley's Catheter, n=30). A greater proportion of participants in Group A achieved delivery within 24 hours (20/30, 66.7%) compared to Group B (9/30, 30.0%; p=0.004). Conversely, delivery after 24 to 48 hours was more common in Group B (21/30, 70.0%) than in Group A (10/30, 33.3%). Blood transfusion requirements were low and comparable between the groups, with 5 (16.7%) participants in Group A and 4 (13.3%) in Group B requiring 1 bag of blood (p=0.264).

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Most of participants (60.0%) had hospital stayed <3 days in group A and in group B most of participants (70.0%) had hospital stayed 3-6 days, which was statistically significant (P=0.019). These findings suggest that Dinoprostone gel facilitates faster delivery without increasing the need for blood transfusion or prolonging hospital stays.

Discussion

For women with a history of caesarean scarring, the use of a single Foley catheter in conjunction with dinoprostone gel provides a safe and effective cervical ripening procedure.[14] Mechanical methods reduce hyperstimulation risk and are cost-efficient compared to pharmacological agents.[15] Dinoprostone facilitates collagen breakdown and cervical softening without increasing uterine rupture rates.[2] Comparable efficacy and improved Bishop scores have been reported when combining both methods in scarred uteri (Choudhary and Godara 2021). Clinical outcomes, including vaginal delivery rates and maternal-fetal safety, are generally consistent across both techniques.[16]

The distribution of baseline demographic variables, particularly age, showed no significant variation between the dinoprostone gel and single Foley catheter groups, with 90% of participants aged 18–34 years in both groups, consistent with findings from Chawla et al.[16] and Das et al.[15], who also reported uniform demographic characteristics across intervention arms. This uniformity enhances internal validity and minimizes confounding.[17] Bhowmick et al.[14] reported similar age patterns and balanced participant characteristics before induction. In contrast, Gupta et al.[18] observed wider variability in maternal age, which was associated with longer induction intervals. Dahiya et al.[2] emphasized that age uniformity contributes to better comparability of outcomes. All of these results together confirm that age parity between groups facilitates objective assessment of induction effectiveness in scarred uteri .[19,20]

The distribution of educational attainment between the dinoprostone gel and Foley catheter groups was statistically comparable, with 40% of participants in each group educated up to SSC-HSC level (p=0.199), reflecting balanced baseline characteristics crucial for assessing intervention outcomes. Similar trends were observed by Gupta et al.[18], where education did not significantly affect the response to induction methods. In contrast, Shetty et al.[20] reported a slightly higher response rate among women with greater educational attainment, suggesting a possible influence of health literacy on compliance and understanding of induction protocols. Despite these minor contrasts, the general consensus supports the minimal impact of education level on cervical ripening outcomes in women with previous caesarean scars.

The occupational distribution indicated that housewives formed the largest subgroup in both intervention arms, with 43.3% in the dinoprostone gel group and 70% in the Foley catheter group (p=0.072), suggesting a non-significant trend towards higher representation among non-working women. Comparable observations were made by Chawla et al.[16], who reported a predominance of homemakers, although occupational status showed no association with induction outcomes. Similarly, Das et al.[15] (2016) found no statistically significant differences in procedural efficacy based on employment status, reinforcing that occupation is unlikely to influence the effectiveness of cervical ripening methods in women with previous caesarean scars.

Income levels were not significantly different between the dinoprostone gel and Foley catheter groups, with 56.7% and 66.7% of participants respectively earning above 25,000 Taka (p=0.425), indicating balanced socioeconomic status. Similar findings were noted by Gupta et al.[18], where income distribution did not influence the success of induction. In contrast, Shah et al.[19] observed slightly faster induction outcomes among higher-income groups, possibly linked to better antenatal care access. Despite minor differences, the current socioeconomic homogeneity supports valid comparisons of induction effectiveness across both groups in women with previous caesarean scars.

The BMI distribution showed that most participants were within the normal (18.5–24.9 kg/m²) or overweight range (25–29.9 kg/m²), with smaller proportions categorized as obese or underweight. This pattern is consistent with research by Chawla et al.[16], who found that normal and overweight women were more likely to undergo induction and that BMI had no discernible impact on the results. However, Gupta et al.[18] suggested that higher BMI may prolong the

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induction-to-delivery interval, likely due to altered prostaglandin metabolism and mechanical resistance in obese individuals. The current BMI trends support the relevance of examining induction efficacy across BMI categories in women with prior caesarean scars.

The distribution of comorbidities between participants receiving dinoprostone gel and those managed with single Foley catheter was statistically comparable across all assessed conditions, ensuring balanced baseline health status for outcome interpretation. The prevalence of diabetes mellitus was similar in both groups, consistent with findings by Gupta et al.[18], who also reported no significant impact of diabetes on induction efficacy. Hypertension, observed in 30.0% of Group A and 20.0% of Group B, did not differ significantly, aligning with the results of Chawla et al.[16], where hypertensive disorders were equally distributed and not associated with altered induction outcomes. Thyroid dysfunction, affecting 20.0% in both groups, reflected findings from Shah et al.[19], indicating minimal influence of thyroid status on labor progression when adequately managed.

Notably, although the prevalence of COPD was higher in the dinoprostone group (13.3%) compared to the Foley group (3.3%), this difference was not statistically significant. Similar non-significant disparities in pulmonary conditions were also noted by Dahiya et al.[2], suggesting mechanical and pharmacological induction can both be safely administered in patients with respiratory comorbidities. Additional comorbidities reported more frequently in Group B (40.0%) versus Group A (23.3%) also lacked statistical significance, reinforcing the demographic parity. Das et al.[15] and Bhowmick et al.[14] documented similar balanced comorbidity profiles, confirming that variations in medical background did not affect method selection or success rates. Such baseline comparability, as supported by Choudhary and Godara[17] and Shetty et al.[20] strengthens the internal validity of comparative induction studies in women with previous caesarean scars by minimizing confounding from pre-existing medical conditions.

Gravida and parity distributions showed no statistically significant differences between the dinoprostone gel and Foley catheter groups, with the majority being in their second pregnancy and primiparous. These findings align with observations by Das et al.[15], who reported balanced gravida and parity profiles across induction methods, supporting the comparability of intervention effects. Gupta et al.[18] similarly noted a predominance of second gravida and primiparous participants, which did not alter the success of labor induction. Chawla et al.[16] emphasized that parity may influence induction duration but not the overall effectiveness of the induction method. Shah et al.[19] found a higher prevalence of multiparous women but reported comparable outcomes between groups, reinforcing the notion that parity alone does not bias efficacy comparisons. Additionally, Dahiya et al.[2] reported no differential outcomes across parity levels, suggesting both methods are suitable across parity categories. The present parity and gravida distribution thus supports reliable outcome comparisons between induction techniques in women with previous caesarean scars.

Gestational age distribution between the dinoprostone gel and Foley catheter groups was statistically comparable, with the majority of terminations occurring between 25–28 weeks (p=0.529). This similarity supports balanced group comparison and reflects trends noted by Shah et al.[19] who found that mid-trimester gestations dominate medical termination cases involving prior caesarean scars. Gupta et al.[18] also observed that gestational age did not significantly impact the choice or success of induction methods when cervical status was unfavorable. Bhowmick et al.[14] highlighted the effectiveness of both methods in the mid-trimester range, with gestational age having minimal influence on overall outcomes. Furthermore, Chawla et al.[16] confirmed that comparable gestational ages between intervention arms increase internal validity when evaluating induction efficacy. These findings reinforce the reliability of subsequent comparisons between dinoprostone gel and Foley catheter use in scarred uteri at similar gestational stages.

Ultrasound findings revealed comparable frequencies of multiple congenital anomalies and single lethal anomalies across both dinoprostone gel and Foley catheter groups, indicating no significant difference in fetal anomaly distribution (p=0.891). This aligns with observations by Shah et al.[19] who reported similar anomaly patterns in preterm terminations, emphasizing that congenital anomalies did not influence the selection

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of induction method. Chawla et al.[16] found that both mechanical and pharmacological methods were equally applied in pregnancies with lethal fetal anomalies, reinforcing their safety and applicability. Bhowmick et al.[14] also confirmed no significant impact of fetal anomaly type on induction outcomes. Gupta et al.[18] highlighted that anomaly presence did not modify the effectiveness or safety of either method. These comparable fetal characteristics enhance the internal validity of outcome comparisons between the two induction strategies in pregnancies complicated by congenital anomalies.

The distribution of indications for medical termination of pregnancy was statistically comparable between the dinoprostone gel and Foley catheter groups (p=0.875), reinforcing the baseline equivalence necessary for comparing efficacy outcomes. Congenital anomalies were the most frequent indication in both groups, consistent with findings from Shah et al.[19] who reported a high prevalence of fetal malformations as a primary reason for termination in mid-trimester pregnancies. Maternal complications such as preeclampsia were similarly distributed, echoing observations by Bhowmick et al.[14], who highlighted that maternal hypertensive disorders did not significantly alter the selection or effectiveness of cervical ripening methods. Rare indications, including maternal heart disease and fetal hemoglobinopathies, occurred sporadically across both arms, similar to the distributions noted by Chawla et al.[16] and Gupta et al.[18], where such cases were included but did not affect outcomes. The balanced incidence of intrauterine fetal death also supports the validity of subsequent outcome comparisons, a pattern reflected in the work of Das et al.[15], who emphasized that uniform indication profiles enhance methodological robustness in termination studies. These observations confirm that both induction strategies were applied across a comparable clinical context in women with previous caesarean scars.

The significant difference in induction outcomes between the dinoprostone gel and single Foley catheter groups (p=0.004), with a lower failure rate in Group A (6.7%) compared to Group B (36.7%), underscores the superior efficacy of pharmacologic induction. Similar superiority of dinoprostone in achieving successful labor induction has been documented by Chawla et al.[16] and Gupta et al.[18], particularly in cases involving a prior uterine scar. Bhowmick et al.[14] also observed a higher success rate with dinoprostone, attributing its effectiveness to enhanced cervical ripening properties. While Dahiya et al.[2] reported comparable results between mechanical and pharmacologic methods, their findings still supported the clinical advantage of dinoprostone in reducing induction failure. These consistent observations reinforce the effectiveness of dinoprostone gel in scarred uteri requiring termination.

The significantly shorter induction-to-active labor and induction-to-delivery intervals in the dinoprostone gel group compared to the Foley catheter group (p=0.001 and p=0.004, respectively) suggest superior efficiency of pharmacologic induction in managing termination with prior cesarean scars. These findings are supported by Bhowmick et al.[14], who reported reduced time intervals with dinoprostone, attributing this to its enhanced cervical ripening action. Chawla et al.[16] similarly observed quicker transition to active labor with dinoprostone compared to mechanical methods. In contrast, Dahiya et al.[2] found comparable induction durations across both groups, though still slightly favoring dinoprostone. Gupta et al.[18] reported that mechanical methods required longer oxytocin augmentation, contributing to delayed labor progression. These data collectively reinforce the time efficiency advantage of dinoprostone gel for induction in scarred uteri.

Cervical dilation achieved following induction showed no significant difference between the dinoprostone gel and Foley catheter groups (p=0.459), with the majority reaching 4–6 cm in both groups. This pattern mirrors findings by Chawla et al.[16], who reported similar post-induction dilation levels across pharmacologic and mechanical methods in mid-trimester termination cases. Gupta et al.[18] also documented that while time to reach dilation varied, the final cervical dilation achieved was not statistically different between techniques. Bhowmick et al.[14] noted slightly greater Bishop score improvement with dinoprostone, though final dilation remained consistent across groups. In contrast, Dahiya et al.[2] observed marginally enhanced cervical dilation with mechanical methods, though the difference was clinically insignificant. The current findings confirm

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that both induction approaches effectively achieve cervical readiness in scarred uteri.

Oxytocin requirement following induction was comparable between groups, with 70.0% in the dinoprostone gel group and 66.7% in the Foley catheter group requiring augmentation (p=0.781), indicating similar stimulation thresholds despite differences in induction-to-delivery timing. Gupta et al.[18] observed a comparable oxytocin need across both methods, attributing it to initial cervical status rather than induction type. Bhowmick et al.[14] reported faster delivery progression with dinoprostone, consistent with current findings, yet without significant differences in oxytocin dependency. Chawla et al.[16] supported these outcomes, noting that pharmacologic agents hastened cervical changes but did not significantly reduce the requirement for oxytocin. Das et al.[15] also found both methods similarly dependent on augmentation in prolonged inductions. These findings suggest that while dinoprostone may accelerate labor onset, overall labor support remains comparable.

Intra-partum complications showed no statistically significant differences between the dinoprostone gel and single Foley catheter groups, indicating comparable safety profiles for both methods in patients with previous cesarean scars. The need for hysterotomy or laparotomy was rare and limited to one case (3.3%) in the dinoprostone group, consistent with findings by Chawla et al.[16], who reported similarly low surgical intervention rates in pharmacologically induced terminations. Uterine rupture, also reported in one dinoprostone case, did not reach statistical significance and reflects rates observed in studies such as Gupta et al.[18] and Dahiya et al.[2], where scar integrity was largely maintained regardless of induction method. Surgical evacuation via dilation and curettage was equally reported in both groups, supporting the results of Bhowmick et al. (2024) and Das et al.[15], who concluded that both techniques are safe and do not increase procedural risk. These consistent findings across multiple sources underscore the clinical acceptability of both methods in managing second-trimester terminations with uterine scars.

Postpartum outcomes revealed a significantly higher proportion of participants achieving vaginal delivery within 24 hours in the dinoprostone gel group compared to the Foley catheter group (66.7% vs. 30.0%; p=0.004), suggesting greater time efficiency with pharmacologic induction. These results are in agreement with Bhowmick et al.[14], who also observed shorter delivery intervals with dinoprostone. Chawla et al.[16] and Gupta et al.[18] reported similar findings, attributing this to the faster cervical ripening and uterine response associated with prostaglandin agents. In contrast, Dahiya et al.[2] noted no significant difference in total induction-to-delivery time, although Foley catheter required more oxytocin support. Blood transfusion requirements remained low and statistically comparable between groups, consistent with the observations by Das et al.[15] (2016) and Shah et al.[19] who emphasized that neither method significantly increased postpartum hemorrhage risk. These findings reinforce the safety of both methods, while highlighting the enhanced efficiency of dinoprostone in facilitating timely delivery among women with previous cesarean scars.

Hospital stay duration was significantly shorter in the dinoprostone gel group, where 60.0% of participants were discharged within 3 days compared to 70.0% in the Foley catheter group staying 3–6 days (p=0.019). This reflects faster induction-to-delivery progression without increasing the need for additional interventions. Similar outcomes were reported by Bhowmick et al.[14], who observed reduced hospitalization time in patients induced with dinoprostone. Gupta et al.[18] also noted earlier discharges among those induced pharmacologically due to shorter labor durations. In contrast, Dahiya et al.[2] found no difference in hospital stay between induction methods, attributing variations to institutional discharge practices. Das et al.[15] (2016) and Shah et al.[19] further supported that hospital stay correlates with labor duration rather than induction type alone. These findings affirm dinoprostone gel's role in reducing overall healthcare resource use without compromising safety in cases involving previous cesarean scars.

LIMITATION OF THE STUDY

The small single-center study's limited sample size and potential institutional bias reduce generalizability. Short-term outcomes lacked long-term follow-up; unblinded design risked bias. Uncontrolled oxytocin variations and excluded psychological assessments and

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multiple cesarean cases restrict applicability to diverse populations and complex obstetric histories.

CONCLUSION

This study demonstrated that Dinoprostone gel is more effective than Single Foley's Catheter for medical termination of pregnancy in women with previous cesarean scars. While baseline demographics, comorbidities, pregnancy characteristics, and indications for termination were comparable between groups, Dinoprostone resulted in significantly higher induction success, shorter time to labor and delivery, and reduced hospital stay. Both methods showed similar safety profiles with no significant differences in complications or need for blood transfusion. These findings support the use of Dinoprostone gel as a safer and more efficient option in this clinical context.

RECOMMENDATIONS

Future research requires larger multi-center trials with long-term uterine/pregnancy outcome tracking. Standardize oxytocin protocols and integrate patient-centered metrics (satisfaction, well-being). Cost-effectiveness analyses, subgroup assessments (parity, BMI), and combined method evaluations can optimize safety and affordability, particularly in resource-limited settings, ensuring holistic, evidence-based obstetric care.

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