RESEARCH PAPER

Prevalence and Outcomes of Labor Induction with Dinoprostone Gel and Foley's Catheter in a Tertiary Care Hospital

Nalam Vineela Nirmala[3], Muthineni Pradeep Kumar[3], Koppula Jyothi[2], Dr. Rajagiri Triveni[1], Motupalli Poojitha[3], Mekala Keerthi priya[3], Viswanadhapalli Jaswanth raju[3], Dr. Jagarlamudi Naga Mahima chowdary[4], Dr. Sajana Gogineni[5], Dr. Koppula Sirisha*[1]

[1]Assistant professor, Department of Pharmacy Practice, KVSR Siddhartha College of Pharmaceutical Sciences, Vijayawada, Andhra Pradesh, India
[2]Assistant professor, Department of Pharmaceutical Analysis, KVSR Siddhartha College of Pharmaceutical Sciences, Vijayawada, Andhra Pradesh, India
[3]Pharm D Intern, KVSR Siddhartha College of Pharmaceutical Sciences, Vijayawada, Andhra Pradesh, India
[4]MBBS, Guntur Medical College, Kannavarithota, Guntur, Andhra Pradesh, India
[5]Professor & HOD, Department of OBG, Dr. Pinnamaneni Siddhartha Institute of Medical Sciences & Research Foundation, Gannavaram, Andhra Pradesh, India
***Corresponding Author:** Dr. Koppula Sirisha, Email: vineelan1008@gmail.com*

Received: 23rd September, 2026, Revised: 8th October, 2026, Accepted: 20th October, 2026, Published: 5th Nov., 2026

ABSTRACT

Background: This study aimed to evaluate the prevalence and outcomes of labour induction using Dinoprostone gel and Foley's catheter in a tertiary care hospital.

Materials and Methods: This prospective observational study was conducted over a six-month period by the Department of Obstetrics and Gynaecology. Included were 135 pregnant women between the ages of 18 and 40 who had a single pregnancy, a cephalic presentation, a gestational age of at least 37 weeks, and a Bishop score of less than 6. Maternal characteristics, induction-to-delivery time, mode of delivery, and maternal and neonatal outcomes were all recorded and analysed.

Results: Of the study population, 24.4% of inductions were failed and 75.6% were successful. Women over 30 were more likely to experience induction failure (41.7%) than women under 30 (20.7%). Nulliparous women had a higher failure rate (34.1%) than primiparous (7.3%) and multiparous (0%) women. Obesity (BMI ≥30 kg/m2) was also associated to a higher likelihood of failed induction. For gestational ages ≥40 weeks, the percentage of failed induction was higher than for those <40 weeks. Women with a Bishop score of ≤3 had a significantly higher failure probability than those with a score of >3.Most women delivered delivery within 12 to 24 hours of induction. Although caesarean sections were carried out due to foetal discomfort and non progression of labour, the majority gave delivery vaginally. Maternal issues were few, and neonatal outcomes were generally favourable.

Conclusion: Using Foley's catheter with Dinoprostone gel to induce labour has a major rate of vaginal birth. Maternal factors like as age, parity, BMI, gestational age, and Bishop score have a significant impact on the outcome of induction.

Keywords: Labor induction; cervical ripening; Foley catheter; Dinoprostone gel; Induction outcome

How to cite this article: Nirmala NV, Kumar MP, Jyothi K, Triveni R, Poojitha M, Keerthi Priya M, Raju VJ, Chowdary JNM, Gogineni S, Sirisha K. Prevalence and Outcomes of Labor Induction with Dinoprostone Gel and Foley's Catheter in a Tertiary Care Hospital. Int J Drug Deliv Technol. 2026;16(89s): 252-257; DOI: 10.25258/ijddt.16.89s.25

INTRODUCTION

When continuing the pregnancy could put the mother or foetus at higher risk, induction of labour is a frequent obstetric procedure used to artificially start uterine contractions in order to achieve vaginal delivery.[1,2] Due to better obstetric care and more maternal and foetal observation, the rate of labour induction has significantly grown over the past few decades. A number of maternal, foetal, and cervical factors particularly cervical favorability as determined by the Bishop score are necessary for a successful induction. Prolonged labour, unsuccessful induction, and higher rates of surgical deliveries are all more likely to occur in women with an unfavourable cervix.[3-5]

Cervical ripening and labour induction are accomplished by a variety of pharmacological and mechanical techniques. Because it encourages cervical softening and increases uterine contractions, dinoprostone gel, a prostaglandin E_2 formulation, is frequently used for cervical ripening.[6,7] However, problems including foetal distress and uterine hyperstimulation may arise from its use. By directly dilating the cervix and stimulating the release of endogenous prostaglandins, mechanical techniques like Foley's catheter cause cervical ripening. Foley's catheter

is thought to be safe, economical, and associateded to a decreased risk of excessive uterine activity.[8·9] Recent advancements have made Dinoprostone gel and the Foley catheter a popular option for labour induction, especially in women with poor cervical conditions. The combination of these two agents makes it possible to improve ripening of the cervix, shorten the duration from induction to delivery, and increase the chances of vaginal delivery with proven safety for both mother and fetus.[10,11]

The parameters that affect the success of labour induction procedures include maternal factors such as age, parity, BMI, gestational age and Bishop score.[12,13] Moreover, it is important to consider the impact of labour induction on both mother and baby in terms of delivery mode, success of induction, fetal situation and complications after delivery. Hence, the aim of the research was to assess the parameters associated with successful outcomes of the induction process and define the outcomes, as well as prevalence of labour induced with the help of Dinoprostone gel and Foley catheter at a tertiary level hospital.

Materials and Methods

The observational study which was carried at the obstetrics and gynaecology department of the Dr. Pinnamaneni Siddharta Institute of Medical Science and Research Foundation, tertiary hospital over the period of September 2025 to March 2026 in order to study the outcome of labour induction through the use of Foley catheter and Dinoprostone gel.

Inclusion Criteria:

The candidates for the study should be 18 – 40 years of age, having a singleton pregnancy, cephalic presentation, gestational age of 37 weeks and Bishop score of under six at the time of admission.

Exclusion Criteria:

The exclusion criteria included women with a history of caesarean section and multiple pregnancies, abruptio placentae, placenta previa, unexplained vaginal bleeding, foetal distress, major foetal anomalies, intra uterine foetal death, active genital infection, chorioamnionitis and any other factor that would not allow the labour induction.

The study included 135 patients who had been admitted for induction of labour. Each patient provided detailed obstetric and demographic data regarding admission such as the age, BMI, gestational age, parity or gravidity, and the indication for induction, among others. According to institutional protocols, induction of labour was performed using Dinoprostone gel as well as Foley's catheter. Throughout the entire process of induction, all patients were monitored closely. The study's assessment was done based on the outcome of mother, infant, time taken for delivery after induction and the mode of delivery.

Statistical Analysis

IBM SPSS (version 21) was used to analyze data entered in excel. In categorical variables, frequencies and percentages were provided. The means ± SD were used for continuous variables. The Chi-square test was performed for correlation analysis. A p-value of less than 0.05 was considered significant.

Results

Dinoprostone Gel and the Foley catheter technique were used to induce all 135 pregnant women who participated in this study. The majority of the ladies were under 30-year-old first-time mothers who had not yet reached 40 weeks of gestation. Furthermore, most women with a Bishop score higher than 3 were admitted to the hospital for labour induction. 75.6% of the women who took part in the study were successfully induced using labour induction; the remaining 24.4% were not. Mothers under 30 years old had considerably better labour induction results than mothers over 30 years old (p=0.03), indicating a substantial correlation between maternal age and labour induction outcomes. Furthermore, the effectiveness of labour induction was influenced by the mother's BMI; women with a BMI of 30 kg/m2 or above had a higher rate of unsuccessful labour inductions than those with a lower BMI (p=0.01).

Given that nulliparous women had much greater rates of unsuccessful labour inductions than primiparous and multiparous women, parity was found to have a significant connection with the result of labour induction (p=0.002).Compared to women who were pregnant for less than 40 weeks, those who were pregnant for 40 weeks or more had a significantly higher number of unsuccessful labour inductions (p=0.02). The outcome of labour induction was substantially correlated with the Bishop score; women who scored higher than three had a significantly better success rate than those who scored three or lower (p<0.0001) [Table 1]. Post-dates were the most frequent obstetric reason for labour induction. There was no statistically significant correlation between the induction results of PROM, gestational diabetes, hypertensive diseases of gestation, intrauterine growth restriction, oligoamnios, and Rh factor. [Table 2]

A total of 85 women (63%) received oxytocin to have the effective uterine contractions and got on smoothly with the labor while the other 50 women (37%) maintained the progress of labor without the help of this drug [Figure 1]. Most women who had successful induction undergone delivery in a period of <12 hours (85.5%), followed by 12–24 hours (67.7%) and finally >24 hours (25%) [Table 3]. The majority of women delivered their babies by the normal vaginal way of birth delivery (76%) indicating that the induction method was successful by the vaginal way of delivery. The necessity of performing Caesarean section occurred in 24%, where 3% related to failed induction, while the other percent (21%) because of other obstetric reasons [Figure 2]. The most common reasons for making Caesarean section the failure of labor induction, non-progress of labor or fetal distress [Table 4]. Maternal complications including fever, the ruptured perineum, and uterine hyperstimulation were very fewer observed [Table 5]. There were few instances of neonatal

disturbances including fetal distress, low birth weight, meconium-stained amniotic fluid, Apgar score below normal level, and NICU admissions [Table 6].

Table 1: Demographic and Obstetric Factors in Comparison with Outcome of Labor Induction

Variable	Category	Successful Induction (n=102)	SI (%)	Failed Induction (n=33)	FI (%)	χ^2 value	p value
Maternal Age	< 30 years	88	79.3	23	20.7	4.69	0.03*
	≥ 30 years	14	58.3	10	41.7		
BMI (kg/m²)	< 18.5	7	100	0	0	11.39	0.01*
	18.5 – 24.9	42	84	8	16		
	25 – 29.9	34	77.3	10	22.7		
	≥ 30	19	55.9	15	44.1		
Parity	Nulliparous	58	65.9	30	34.1	12.89	0.002*
	Primiparous	38	92.7	3	7.3		
	Multiparous	6	100	0	0		
Period of Gestation	< 40 weeks	101	77.1	30	22.9	5.70	0.02*
	≥ 40 weeks	1	25	3	75		
Bishop Score	≤ 3	17	41.5	24	58.5	37.06	<0.0001*
	> 3	85	90.4	9	9.6		

Table 2: Association between Indications for Labor Induction and Outcome of Induction

Obstetric Variable	Category	Successful Induction (n = 102)	SI (%)	Failed Induction (n = 33)	FI (%)	Total (n)	χ^2 value	*p* value
Past dates	No	99	75.6%	32	24.4%	131	0.001	0.98
	Yes	3	75%	1	25%	4		
PROM	No	98	77.2%	29	22.8%	127	3.01	0.08
	Yes	4	50%	4	50%	8		
GDM	No	88	77.2%	26	22.8%	114	1.06	0.3
	Yes	14	66.7%	7	33.3%	21		
HDP	No	98	74.8%	33	25.2%	131	1.33	0.25
	Yes	4	100%	0	0%	4		
Rh	Positive	100	75.2%	33	24.8%	133	0.66	0.42
	Negative	2	100%	0	0%	2		
FGR	No	101	75.9%	32	24.1%	133	0.72	0.40
	Yes	1	50%	1	50%	2		
Oligos	No	100	75.8%	32	24.2%	132	0.13	0.72
	Yes	2	66.7%	1	33.3%	3		

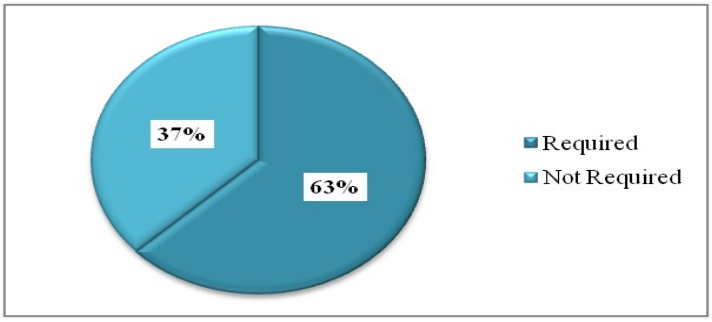


Figure 1: Distribution of Oxytocin Requirement during Labor Induction

Table 3: Distribution of Induction-to-Delivery Interval According to Outcome of Induction

IDI	Successful Induction (n = 102)	SI (%)	Failed Induction (n = 33)	FI (%)
< 12Hrs	59	85.5%	10	14.5%
12–24Hrs	42	67.7%	20	32.3%
> 24Hrs	1	25%	3	75%

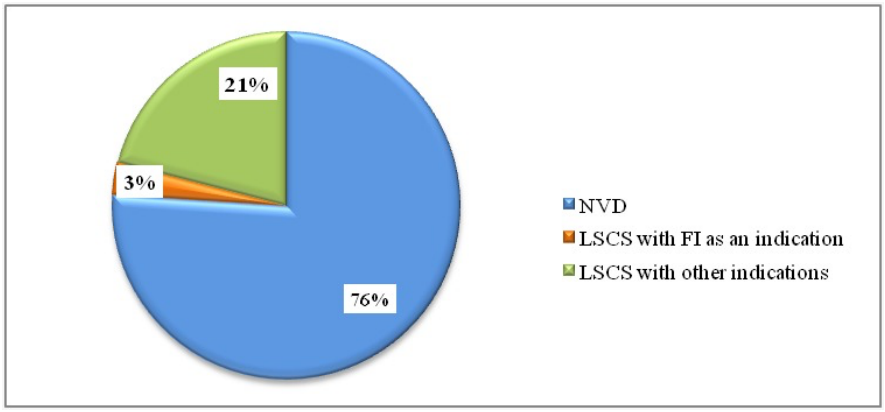


Figure 2: Distribution of Mode of Delivery Following Labour Induction

Table 4: Indications for Caesarean Section

Indication for Caesarean Section	Frequency (n)	Percentage (%)
Fetal distress (NRFHR)	12	36.4%
Non-progress of labour (NPL)	11	33.3%
Failed induction (FI)	4	12.1%
Deep transverse arrest (DTA)	2	6.1%
Meconium-stained liquor (MSL)	2	6.1%
Blood-stained liquor (BSL)	2	6.1%

Table 5: Maternal Adverse Effects Following Labour Induction

Maternal Adverse Effect	Number of Patients (n)	Percentage (%)
Infection	1	0.7%
Perineal Tear	3	2.2%
Uterine Hyperstimulation	2	1.5%
No maternal adverse effects	129	95.6%

Table 6: Neonatal Outcomes Following Labour Induction

Neonatal Outcome	Number of Neonates (n)	Percentage (%)
Fetal distress	12	8.9%
Meconium-stained amniotic fluid	7	5.2%
NICU admission	23	17%
Low birth weight (<2500 g)	30	22.2%
Apgar score <7 at 5 min	3	2.2%
No neonatal complications	60	44.4%

DISCUSSION

The study found out that 75.6% of the population of the research was successful in inducing labour, thus confirming the efficiency of Dinoprostone gel and a Foley catheter for the process of cervix maturation and labour induction. The results also confirm the data obtained in Rana et al.[14] (2022) and Madhavi et al.[15] (2019) related to successful induction leading to an even more definite vaginal delivery. In addition, it can be revealed that women under the age of 30 have had better figures than older women which can completely correlate with the results obtained by Padmasri et al.[16] (2025) about the incapacity of older women to induce labour due to incompetent cervix and no nutrition of the uterus.

There are reports that show positive correlation between increased incidence of failed inductions and obesity rates. Such claim was made by Padmasri at al. (2025) after conducting research aimed at determining the impact of maternal obesity on failed inductions. Taking into account the findings of Padmasri et al. (2025) and Kosinska-Kaczynska[17] (2015) indicating a higher number of induction cases in multipara than in nulliparae, it can be concluded that an induction failure rate is higher among nulliparae than among multiparae (Padmasri et al., 2025; Kosinska-Kaczynska et al., 2015).The authors noted that the rate of induction failure is much higher for inductions after 40 weeks of gestational age than for earlier inductions. According to the study by Humaira Arshad et al.[18] (2017), the authors concluded that being post-term reduces the success rate of inductions. In this study, comparable findings have shown that the successful induction rate was associated with higher Bishop score values. The result of the study conforms to the data provided by Aparna Basumatary and others[19] (2024) and K.K Das and others[20] (2016), as they found that cervical status

was the main determinant for successful vaginal product delivery.

In agreement with the results of the study of Mehreen Yousaf Rana et al. (2022) reporting the same mean induction-to-delivery time interval, majority of the women study sample had delivered between 12 and 24 hours following induction. Fetal distress and failure to progress were the main reasons for the use of cesarean sections. In addition, the research results of Singh et al. and Moldawski et al. also indicate that Dinoprostone and Foley catheter are safe methods of induction as long as the fetal and maternal status is monitored properly.

CONCLUSION

The present study established that the use of Dinoprostone gel and Foley's catheter for labor induction is an efficacious and safe procedure with 75.6% induction success and positive maternal and neonatal outcomes. Maternal age, body mass index, parity, gestational age, and Bishop score were found to be possible predictors of induction success highlighting the importance of an appropriate pre-induction evaluation process of the participants. Most of the women were able to give birth vaginally with no maternal complications and good neonatal outcomes. These results show the need for the use of the combination of pharmacological and mechanical methods of labor induction for women who can benefit from the combination of these methods. More multicenter research with larger samples should be conducted to corroborate the results obtained.

ACKNOWLEDGEMENT

The authors gratefully acknowledge the support of their institution and all those who contributed to the successful completion of this work.

FINANCIAL SUPPORT AND SPONSORSHIP

No funding is received

CONFLICT OF INTEREST

Nil

REFERENCES

1. Nisiya KS, Devi U, Ahmed FM. A prospective study on comparison of effectiveness and safety of dinoprostone intracervical gel and dinoprostone vaginal insert on induction of labour. Int J Clin Obstet Gynaecol. 2022;6(1):152–60.
2. Rajeswari A, Sivaranjan P. Comparative Study of Intra-Cervical Foley's Catheter and PGE2 Gel for Pre-Induction Cervical Ripening. JMSCR. 2017;5(8):2450-5.
3. Mathuriya G, Kushwaha S, Pradhan S. Comparative study of induction of labour with dinoprostone gel versus mechanical dilatation in unfavorable cervix (low Bishops Score). International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 2017 Oct 1;6(10):4363-6.
4. ul Ain Q, Luqman S, Tasneem N. Modified Bishop Score, Does It Need Any Remodification. Journal of The Society of Obstetricians and Gynaecologists of Pakistan. 2018;8(4):261-6.
5. Mlodawski J, Mlodawska M, Armanska J. Dinoprostone vaginal insert vs the Foley catheter in labor induction. Observational study. Clinical and Experimental Obstetrics & Gynecology. 2021 Jun 15;48(3):665-9.
6. Chawla D, Tomar A, Renjhen P. Dinoprostone Gel versus Intra-cervical Foley's Catheter for Pre-induction Cervical Ripening: An audit. Indonesian Journal of Obstetrics and Gynecology. 2023 Feb 2:3-4.
7. Hostinska E, Lubusky M, Pilka R. Prospective comparison of cervical ripening with double balloon Cook catheter, misoprostol or dinoprostone in term singleton pregnancies. Ginekologia Polska. 2023;94(3):221-8.
8. Iqbal M, Tariq H, Chaudhry H. Comparison of dinoprostone with transcervical balloon catheter for labour induction. Pakistan Armed Forces Medical Journal. 2015 Dec 1(6):773-6
9. Rachel AA, Gigi A. Comparative study on cervical ripening and labour induction with dinoprostone versus foley's catheter with extra amniotic saline infusion. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 2020 Oct 1;9(10):4080-6.
10. Gupta S, Kagathray B. Induction of labor in women with unfavourable cervix: comparison of efficacy of intracervical Foley catheter with PGE2 gel. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 2019 Jun 1;8(6):2178-83.
11. Zakerihamidi M, Kianifar S, Moradi A, Boskabadi H. Apgar score at various gestational ages. Journal of Clinical Neonatology. 2023 Jul 1;12(3):105-8.
12. Durga K. Comparative study of extra amniotic saline infusion through intracervical balloon catheter and prostoglandin E2 gel for induction of labour. SchInt J ObstetGynec. 2021;4(11):466-70.
13. Urvashi, Sahu S, Chawang KR, Singh S, Jain M, Singh N. To compare the effect of intracervical Foley catheter balloon and dinoprostone gel for induction of labour. International Journal of Medical Science and Current Research . 2024;7(2):536-544.
14. Rana MY, Ali HS, Kulsoom O, Yasmeen R, Gul R. Induction of labour at term: comparison of prostaglandin E2 with Foley Catheter. Pakistan Journal of Medicine and Dentistry. 2022;11(1):50-5.
15. Madhavi, Sinha A. Induction of labour – Foley's catheter versus prostaglandin E2 gel at JLNMC H, Bhagalpur, Bihar. International Journal of Pharmaceutical and Clinical Research. 2023;15(3):1201-7.
16. Sandhya Devi KVSM, Padmasri PS, Madhavi J, Devi Y, Chowdhary NM, Srilakshmi K. Observational study to identify the factors associated with failed induction in a tertiary care centre. Int J Med Public Health. 2025;15(1):625–31.

17. Kosinska-Kaczynska K, Ciechanowicz P, Saletra A, Szymusik I, Wielgos M. Two methods of cervix ripening: intracervical Foley catether and dinoprostone–which one is actually more efficient?. Neuroendocrinology Letters. 2015 Jan 1;36(3):257-61.
18. Arshad H, Qamar K, Mahmood S. Comparison of induction of labor with Foley catheter and prostaglandins in postdate pregnancies. Pakistan Armed Forces Medical Journal. 2017 Apr 1;67(2):243-8
19. Roy SB, Roy SB, Ghosh B, Hazra D, Basumatary A. Dinoprostone Gel versus Foley Catheter for Induction of Labour in Low Bishop's Score: A Prospective and Comparative Study. European Journal of Cardiovascular Medicine. 2025 Jun 28;15:691-4.
20. Das KK, Jaganath Patar DA. Comparing Effectiveness of Transcervical Foley Catheter Versus Intracervical Dinoprostone Gel for Induction of Labour.