

Original Article

DOI: <https://doi.org/10.47648/jswmc2026v16-1-133>

Vaginal Misoprostol Versus Intracervical Catheterization for Induction of Labour in Intrauterine Foetal Death

*Pally BN¹, Nath SC², Chakroborty S³, Begum E⁴, Chowdhury PA⁵

Abstract:

Intrauterine foetal death (IUFD) is the most undesirable consequence of pregnancy which is psychologically stressful for the woman including her family members and the health care providers. If the fetus is retained for more than 4 weeks, mother is in risk of development of disseminated intravascular coagulation (DIC) and when the membrane is ruptured there is also risk of development of chorioamnionitis and its sequelae of endotoxic shock, sepsis and ultimately maternal death. Therefore, it is necessary to ensure safe delivery of mother with low cost as well as effective method. This study was conducted in the Department of Obstetrics and Gynaecology, Sylhet M.A.G Osmani Medical College Hospital, from July 2016 to June 2018 to compare the effectiveness of vaginal misoprostol versus intracervical Foley's catheter for induction of labour in intrauterine foetal death. A total number of 132 pregnant women with IUFD without labour pain, intact membrane, singleton pregnancy, cephalic presentation, adequate Pelvis and low Bishop score (≤ 5) were selected. They were divided into two groups, each consisting of 66 patients. One group (Group- I) was treated with 50 micrograms misoprostol intravaginally every 6 hourly for a maximum of eight doses. In another group (Group-II), an 18-sized Foley's catheter was inserted into the endocervical canal and inflated with 30 ml of distilled water. The catheter was taped to the inner thigh with slight traction. The cervix was reexamined after six hours in both groups. Vaginal misoprostol and intracervical Foley's catheter treated groups were comparable in respect to maternal age (mean $\pm$ SD) of 25.23 ± 4.60 years versus 26.39 ± 4.84 years, $p > 0.05$; gestational age (mean $\pm$ SD) of 33.84 ± 3.81 weeks versus 34.45 ± 3.73 weeks, $p > 0.05$; and initial Bishop's score (mean $\pm$ SD) of 1.68 ± 0.71 versus 1.68 ± 0.69 ; $p > 0.05$. The time interval from induction to delivery (mean $\pm$ SD) was 21.39 ± 5.71 hours in misoprostol treated group and 24.29 ± 8.15 hours in intracervical Foley's catheter treated group. Difference in induction to delivery interval was significant ($p < 0.05$). Delivery mode was vaginal delivery in 98.5% cases in misoprostol group and 100% cases in intracervical Foley's catheter group; difference in delivery mode was not significant ($p > 0.05$). Frequency of successful induction was significantly higher ($p < 0.05$) in vaginal misoprostol group (77.3%) compared to intracervical Foley's catheter group (60.6%). Maternal complications such as postpartum haemorrhage (1.5%) and hyperstimulation (1.5%) occurred in vaginal misoprostol group and none in intracervical Foley's catheter group with no significant difference ($p > 0.05$). Results support the notion that vaginal misoprostol is more effective than intracervical Foley's catheter for induction of labour in intrauterine fetal death with comparable safety profile.

Received date:
05/11/2025

Accepted date:
06/01/2026

Key words: Intrauterine foetal death, Intracervical catheterization, Foley's catheter, Labour

How to cite this article: Pally BN¹, Nath SC², Chakroborty S³, Begum E⁴, Chowdhury PA. Vaginal Misoprostol Versus Intracervical Catheterization for Induction of Labour in Intrauterine Foetal Death. Journal of Sylhet Women's Medical College, 2026 January; 16(1):22-27. <https://doi.org/10.47648/jswmc2026v16-1-133>

JSWMC 2026 [16(01)] P: 22-27

Introduction:

Antepartum death occurring beyond the period of viability is termed as intrauterine foetal death (IUFD).

1. Dr. Bithika Nath Pally Registrar, Dept of Obs and Gynae, Sylhet M.A.G Osmani Medical College Hospital, Sylhet.
2. Dr. Samiran Chandra Nath Assistant Professor, Dept. of Surgery, Sylhet M.A.G. Osmani Medical College Hospital, Sylhet.

3. Dr. Sharmila Chakroborty Assistant Professor, Dept of Obs and Gynae, Sylhet M.A.G Osmani Medical College Hospital, Sylhet.
4. Dr. Eban Begum Registrar, Dept of Obs and Gynae, Sylhet M.A.G Osmani Medical College Hospital, Sylhet.
5. Dr. Parveen Afroz Chowdhury Associate Professor, Dept of Dermatology, SWMCH, Sylhet.

Corresponding author: Dr. Bithika Nath Pally,
Registrar, Dept of Obs and Gynae, Sylhet M.A.G Osmani
Medical College Hospital, Sylhet.
Email- bithikanath1997@gmail.com

It usually results in the delivery of macerated foetus¹. The frequency of IUFD with a retained fetus is estimated to occur in 1% of all pregnancies². When a foetus dies in the uterus, the option for health care is either to await onset of spontaneous labour or to induce labour. About 90% of patients spontaneously undergo labour and delivery by three weeks of the intrauterine death. Expectant management is considered as an acceptable option. In cases where expectant management is chosen, the clinical concern will be the development of disseminated intravascular coagulation and its inherent, risks of hemorrhage, blood transfusion and maternal death².

Retention of the fetus is associated with emotional distress and grief reactions which may be severe. If the rupture of fetal membranes occurs, the risk of intrauterine infection is increases³. Therefore, the decision to induce labour in a patient with a ripe cervix is often uncomplicated in IUFD. Inducing labour in a pregnant woman with an unripe cervix is associated with failed induction of labour and a higher risk of cesarean delivery². Either mechanical or pharmacologic options or the both may be applied as effective cervical ripening methods to enhance the success rate of a vaginal delivery with an unfavourable cervix⁴. These include oxytocin, prostaglandin and Foley's catheter.

Misoprostol is a synthetic prostaglandin and has collagenolytic properties and also sensitizes the myometrium to oxytocin¹. It is more bioavailable when administered vaginally. It is cost effective, easy administration, good tolerability, and its dual action includes cervical ripening and labour induction. It has systemic side effects (nausea, vomiting, diarrhea, shivering) and uterine over activity (hyperstimulation, hypertonus).

Foley's catheter that apply pressure on the internal os of the cervix to stretch the lower uterine segment and increase the release of local prostaglandin. Potential advantages include

simplicity of use, low cost and few side effects. Intracervical Foley catheter is associated with a lower incidence of uterine hyperstimulation during labour⁵. Three randomized trials compared vaginal misoprostol with Foley bulb. These trials found no difference in the induction to delivery time^{6,7,8}. This study is designed to find out the effectiveness and safety of vaginal misoprostol and Foley's catheter in induction of labour and cervical ripening in IUFD.

Materials and methods:

This was a comparative interventional study that was carried out in the department of Obstetrics and Gynaecology, Sylhet M. A. G. Osmani Medical College Hospital, Sylhet for the period of two years starting from 1st July 2016 to 30th June 2018. The present study included a total of 132 pregnant women with IUFD and unfavorable cervix with intact membrane, singleton pregnancy, adequate pelvis, adequate amount of liquor, cephalic presentation, and low Bishop score (<6). Patients with vaginal infection, placenta previa, unexplained vaginal bleeding, presentation other than head, previous caesarean section, oligohydramnions, grand multipara (>4), known hypersensitivity to prostaglandin, pregnancy with other medical disorders like bronchial asthma, heart disease were excluded in this study.

Sampling method was simple random sampling. All data were analyzed by using computer-based Statistical Package for Social Sciences (SPSS) version 22.0. Quantitative data were expressed as mean and standard deviation and comparison was done by 'Z' test. Qualitative data were expressed as frequency and percentage and comparison were carried out by Chi-Square (χ^2) test. A probability (*p*) value of <0.05 was considered as significant. *p*<0.01 was considered as highly significant but *P*>0.05 was considered as insignificant.

Ethical approval

The present study and its protocols were reviewed, and an ethical clearance certificate was issued by the Institutional Ethical Review Committee of Sylhet MAG Osmani Medical College, Sylhet, Bangladesh, with the Memo number SOMC/2017/280. Consent was taken from all patients who participated in the study.

Results:

Total 132 patients with IUFD were selected and were divided into group-I and group-II by simple lottery method. Group-I (n=66) was treated with vaginal misoprostol and group-II (n=66) was treated with insertion of Foley's Catheter. The outcome was followed (Table I).

Table I: Distribution of Patients According to Outcome of Induction

Outcome of induction	Study group		p value
	Group-I (n=66) Frequency (%)	Group-II (n=66) Frequency (%)	
Successful	51 (77.3)	40 (60.6)	*P<0.05
Failure	15 (22.7)	26 (39.6)	
Total	66 (100.0)	66 (100.0)	

*Significant at $p<0.05(\chi^2\text{-test})$

Table-I shows that the induction was successful in 51 (77.3%) cases in vaginal misoprostol group and 40 (60.6%) cases in intracervical Foley's catheter Group. Significantly higher success rate was observed in vaginal misoprostol group compared to intracervical Foley's catheter group in IUFD ($\chi^2 = 4.281$; $P<0.05$).

Table II: Patients Distribution in Accordance with Delivery Mode

Mode of Delivery	Study group		p value
	Group-I (n=66) Frequency (%)	Group-II (n=66) Frequency (%)	
Vaginal delivery	65 (98.5)	66 (100.0)	*p>0.05
Caesarean section	1 (1.5)	0 (0.0)	
Total	66 (100.0)	66 (100.0)	

*Non-significant at $p>0.05(\chi^2\text{-test})$

In vaginal misoprostol group, vaginal delivery (VD) was observed in 65 (98.5%) cases and lower uterine segment caesarean section (LSCS) was observed in 1 (1.5%) case. However, in intracervical Foley's catheter group, VD was observed in 66 (100.0%) cases and none required lower uterine segment caesarean section (LSCS) (Table II). No significant difference in the mode of delivery was observed between the two groups ($\chi^2=1.008$, $p>0.05$).

Table III: Distribution of Patients According to Time of Interval to Delivery Induction

Interval from Induction to Delivery (Hour)	Study group		p value
	Group-I (n=66) Frequency (%)	Group-II (n=66) Frequency (%)	
≤12	4 (6.1)	0 (0.0)	*P<0.05
13-18	14 (21.2)	16 (24.2)	
19-24	35 (53.0)	27 (40.9)	
≥24	13 (19.7)	23 (34.8)	
Mean ± SD in hours	21.39±5.71	24.29±8.15	

*Significant at $p<0.05$ (Z-Test)

Table III shows that the mean ($\pm$ SD) time interval from induction to delivery was 21.39 ± 5.71 hours in vaginal misoprostol group and 24.29 ± 8.15 hours in intracervical Foley's catheter group. The mean time interval from induction to delivery in vaginal misoprostol group was significantly smaller compared to intracervical Foley's catheter group (*Z=-2.369; $p<0.05$).

Table IV: Distribution of Patients According to Maternal Complications

Maternal Complications	Study group		p value
	Group-I (n=66) Frequency (%)	Group-II (n=66) Frequency (%)	
PPH	1 (1.5)	0 (0.0)	*p>0.05
Hyperstimulation	1 (1.5)	0 (0.0)	

Distribution of patients by maternal complications was shown in Table IV. Postpartum haemorrhage (PPH) occurred in 1 (1.5%) case in vaginal misoprostol group and none in intracervical Foley's catheter group; difference was not significant ($\chi^2=1.008$, $p>0.05$). Hyperstimulation occurred in 1 (1.5%) case in vaginal misoprostol group and none in intracervical Foley's catheter group; difference was not significant ($\chi^2=1.008$, $p>0.05$).

Discussion:

Induction of labor refers to artificial stimulation of uterine contraction before spontaneous labor onset to achieve vaginal delivery by means of

medical or surgical maneuver. Labour induction may be indicated despite an unfavourable cervix, but the favourability of the cervix has strong influence on the success of the procedure. An unfavourable cervix is comes with higher than normal incidence of failure of induction, prolonged labour, instrumental delivery and caesarean section. One of such condition is foetal death.

Established mechanical and pharmacological methods are available to promote cervical ripening and the onset of labour. The Foley's Catheter is inserted in order to act primarily as a cervical ripening agent, with the capacity to modify the cervical status and may have limited effect on uterine contractions, aside from the possible release of prostaglandins. Misoprostol, a synthetic prostaglandin E1 analogue is a promising agent in cervical ripening. Its dual action includes cervical ripening and labour induction⁹. Several studies revealed that both Foley's catheter and vaginal misoprostol are equally effective in pre-induction cervical ripening⁹⁻¹¹. But vaginal misoprostol is more effective and as safe as Foley catheter and oxytocin for induction of labor¹²⁻¹⁴.

In Bangladesh, an effective, safe, easily storable and cheaper method is always welcome. Hence the present study was aimed to compare the effectiveness and safety of intravaginal misoprostol versus the Foley's catheter for cervical ripening and labor induction in IUFD. In this study, the induction was successful in 77.3% cases in misoprostol group and 60.6% cases in intracervical Foley's catheter group. Significantly higher success rate of induction was in vaginal misoprostol group compared to intracervical Foley's catheter group in IUFD ($p < 0.05$).

In this study the delivery mode was vaginal delivery in 98.5% cases and lower uterine segment caesarean section in 1.5% cases in vaginal misoprostol group, while mode of delivery was vaginal delivery in 100.0% cases and none required lower uterine segment caesarean section in intracervical Foley's catheter group. No significant difference in

mode of delivery between two groups was observed ($p > 0.05$)

This study revealed that the mean time interval from induction to delivery was 21.39 ± 5.71 hours in vaginal misoprostol group and 24.29 ± 8.15 hours in intracervical Foley's catheter group. The mean time interval from induction to delivery in vaginal misoprostol group was shorter significantly compared to intracervical Foley's catheter group ($p < 0.05$). So in vaginal misoprostol method there was shorter interval from induction to delivery, in comparison with intracervical catheterization method, but the differences was not significant statistically.

These findings were consistent with other studies that presented significantly short induction to delivery interval in misoprostol group¹⁴⁻¹⁷. The present study reveals not significant difference in the total labour duration in women with misoprostol compared with the Foley catheter induction ($p = 0.19$)¹⁸. However, oxytocin augmented labour significantly in women with Foley catheter induction compared to intravaginal misoprostol. Nevertheless, women using misoprostol attributed more uterine contractile abnormalities compared to those using Foley's catheter.

Regarding maternal complications, it was observed in this study that postpartum haemorrhage occurred in 1.5% case in vaginal misoprostol group and none in intracervical Foley's catheter group, difference was not significant ($p > 0.05$). Hyperstimulation occurred in 1.5% of case in misoprostol group and none in intracervical Foley's catheter group, difference was not significant ($p > 0.05$). Afolabi, Oyeneyin, Ogedengbe, (2005) found that tachysystole in 8%, hyperstimulation syndrome in 6%, uterine rupture in 45 and genital laceration in 6% patients of misoprostol group while genital laceration was seen in 6% patients of Foley catheter group, difference was not significant¹⁰.

This study showed that the mean gestational age was 33.84 ± 3.81 weeks in vaginal misoprostol group and was 34.45 ± 3.73 weeks in intracervical Foley's catheter group. The mean

gestational age of the patients insignificantly differ between two treatment groups ($p>0.05$). In the present study 39.4% patients were primigravida and 60.6% patients were multigravida in vaginal misoprostol group, while intracervical Foley's catheter group, 17 (25.8%) patients were primigravida and 49 (74.2%) patients were multigravida. There was no statistically significant difference of gravidity between the two groups ($p>0.05$). The present study showed that the mean Bishop's score was 1.68 ± 0.71 in vaginal misoprostol treated group and 1.68 ± 0.69 in intracervical Foley's catheter group. The mean Bishop's score of the patients in both groups was almost similar ($p>0.05$).

Misoprostol, a synthetic prostaglandin E_1 analogue, is used for the management of induction of labor, miscarriage, cervical ripening before surgical procedures, and the treatment of postpartum hemorrhage. However, the effects of misoprostol are dose-dependent showing contraindications including uterine contractions, cervical softening and dilation, vomiting, diarrhoea, nausea, fever, and chills¹⁹. It acts on the cervix by dissolving the collagen structural network of the cervix. Foley catheter with and without extra-amniotic saline infusion applies pressure on the internal os of the cervix to stretch the lower uterine segment and increase the release of local prostaglandin⁴.

Though the sample size was small, sampling was consecutive and convenient and was conducted in a tertiary care hospital. This study revealed that successful induction was higher in vaginal misoprostol group significantly compared to intracervical Foley's catheter group and induction to delivery time is also significantly shorter in vaginal misoprostol group than the intracervical catheter group. But mode of delivery and maternal complication differ insignificantly between the two groups. Therefore it may be concluded that vaginal misoprostol is more effective than intracervical Foley's Catheter for induction of labour in intrauterine fetal death with comparable safety profile. However, the study needs to be performed with larger population involving multicenter to define the management of intrauterine fetal death.

References:

1. Konar H, editor. 2016. DC Dutta's Textbook of Obstetrics. 8th ed. New Delhi: Jaypee Brothers Medical Publishers (P) Ltd. pp. 375-376.
2. de León RGP, Wing D, Fiala C. 2007. Misoprostol for intrauterine fetal death. *International Journal of Obstetrics and Gynaecology*, 99, S190-S193.
3. Tharihalli C, Bhat S. 2017. Study of vaginal misoprostol for labour induction in intra uterine fetal demise. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*, 6, 479-484.
4. Leduc D, Biringier A, Lee L, Dy J. 2013. Clinical Practice Obstetrics Committee. SOGC Clinical Practice Guideline. Induction of Labour. *Journal of Obstetrics and Gynaecology Canada*, 35, S1-S18.
5. Noor N, Ansari M, Ali SM, Parveen S. 2015. Foley Catheter versus Vaginal Misoprostol for Labour Induction. *International Journal of Reproductive Medicine*, 2015, Article ID 845735.
6. Sciscione AC, Nguyen L, Manley J, Pollock M, Mass B, Colmorgen G. 2001. A randomized comparison of intracervical Foley catheter to intravaginal misoprostol for preinduction cervical ripening. *Obstetrics and Gynecology*, 97, 603-607.
7. Tabowei TO, Oboro VO. 2003. Low dose intravaginal misoprostol versus intracervical balloon catheter for pre-induction cervical ripening. *East African Medical Journal*, 80, 91-94.
8. Kashanian M, Akbarian AR, Fekrat M. 2006. Cervical ripening and induction of labour with intravaginal misoprostol and Foley catheter cervical traction. *International Journal of Obstetrics and Gynaecology*, 92, 79-80.
9. Ferdous J, Khanam NN, Begum MR, Akhter S. 2009. Cervical Ripening: Comparative Study between Intracervical Ballooning by Foley's Catheter and Intravaginal Misoprostol Tablet. *J Bangladesh College of Physician and Surgeon*, 27, 5-12.
10. Afolabi BB, Oyeneyin Ol, Ogedengbe OK. 2005. Intravaginal misoprostol versus Foley catheter for cervical ripening and induction of labor. *International Journal of obstetrics and Gynaecology*, 89, 263-267.

11. Fareed P, Malik S, Mahajan N, Nazir T, Kawoosa S. 2015. Comparative Study of Intra-Cervical Foley Catheter and Vaginal Misoprostol for Pre- Induction Cervical Ripening. *International Journal of Scientific Study*, 3, 40-43.
12. Adeniji OA, Oladokun A, Olayemi O, Adeniji Ol, Odukogbe AA, Ogunbode O, et al. 2005. Pre-induction cervical ripening: transcervical foley catheter versus intravaginal misoprostol. *Journal of Obstetrics and Gynaecology*, 25, 134-139.
13. Adeniji AO, Olayemi O, Odukogbe AA. 2006. Intravaginal misoprostol versus transcervical Foley catheter in pre-induction cervical ripening. *International Journal of Obstetrics and Gynaecology*, 92, 130-132.
14. Filho OBM, Albuquerque RM, Cecatti JG. 2010. A randomized controlled trial comparing vaginal misoprostol versus Foley catheter plus oxytocin for labor induction. *Acta Obstetricia et Gynecologica Scandinavica*, 89, 1045-1052.
15. Promila J, Kaur GB, Bala TA. 2007. Comparison of vaginal misoprostol versus Foley's catheter with oxytocin for induction of labor. *Journal of Obstetrics and Gynaecology India*, 57, 42-47.
16. Sheikher C, Suri N, Kholi U. 2009. Comparative evaluation of oral misoprostol, vaginal misoprostol and intracervical Folley's catheter for induction of labour at term. *JK Science*, 11, 75-77.
17. Roudsari FV, Ayati S, Ghasemi M, Mofrada MH, Shakeri MT, Farshidi F, et al. 2011. Comparison of Vaginal Misoprostol with Foley Catheter for Cervical Ripening and Induction of Labor. *International Journal of Production Research*, 10, 149-154.
18. Tuuli MG, Keegan MB, Odibo AO, Roehl K, Macones GA, Cahill AG. 2013. Progress of labor in women induced with misoprostol versus the Foley catheter. *American Journal of Obstetrics and Gynecology*, 209, 237.e1-e7.
19. Allen R, O'Brien BM. 2009. Uses of Misoprostol in Obstetrics and Gynecology. *Reviews in Obstetrics and Gynecology*, 2, 159-168.