


Research Article

Role of Intracervical Catheterization for Induction of Labour in Case of Intrauterine Fetal Death with History of Previous Caesarean Section

Dr. Fatema Akter Doly¹, Dr. Kazi. Mst Sadeka Tamanna², Professor. Dr. Salma Rouf³, Professor. Dr. Anwar Begum⁴, Dr. Farzana Mahmood⁵, Dr. Mahbubur Rahman Razeed⁶, Dr. Sarmin Sultana Swarna⁷, Dr. Imran Mahmud⁸

Abstract

Background: Induction of labour is a common obstetric procedure. Both mechanical (eg, Foley catheters) and pharmacological methods (eg, prostaglandins) are used for induction of labour in women with an unfavourable cervix. Intrauterine fetal death is the most undesirable consequence of pregnancy, when it occurs it carries a time related risk of consumption coagulopathy and psychological distress. Various methods have been described to induce labor are available. But when patient presents with fetal death along with previous caesarean section delivery choice of suitable method of induction is always difficult because of chance of scar rupture.

Aim of the study: To determine the success rate of intracervical catheterization as a mode of induction of labour in case of intrauterine death (IUD) with previous history of caesarean section.

Methods: This study was undertaken among the patients admitted in the Department of Obstetrics and Gynaecology, Dhaka Medical College Hospital during the period from January 2013 to December 2013. Intracervical catheterization were applied in 50 cases. All the pregnant women admitted and diagnosed as intrauterine fetal death with history of previous caesarean delivery.

Result: In this study the mean age of the patients was 28.18±4.13 years. It was observed that nearly a half of patients (40%) belonged to 31-33 weeks of gestation, 34% between 33-37 weeks and 26% between 38-42 weeks. The common causes of IUD were idiopathic (60%) and gestational hypertension/pre-eclampsia/impending eclampsia as 20%. Other causes were hyper pyrexia (4%), congenital malformation (6%), postmaturity (6%), severe anaemia and Rh incompatibility (4%). Majority 42(84%) of the patients came from middle income group. Nearly half of the patients (44%) had no antenatal check up, 34% had irregular antenatal checkup and 22% had regular antenatal checkup during their pregnancy period. It was found that majority (94%) had achieving vaginal delivery and 6% were delivered by repeat LSCS. It was observed that the induction delivery interval varied from 16 to 23 hours 84% delivered within 20 hours and 16% delivered >20 hours. The mean induction to delivery interval was 11.8 hours. There were no major complications but only minor systemic side effects namely: nausea, shivering, vomiting, fever were observed in majority of the cases. A small number of cases developed reduced platelet count and post-partum haemorrhage and 2 patients developed chorioamnionitis.

Conclusion: This study shows intracervical catheterization achieved successful induction of labour in women with intrauterine fetal death (IUFD) with previous caesarean delivery and shorten the time of induction delivery interval and significantly less side effects.

Affiliation:

¹Manager, MFPC, Department of Obstetrics & Gynecology, Dhaka Medical College Hospital, Dhaka, Bangladesh.

²Medical Officer, Department of Obstetrics & Gynecology, Dhaka Medical College Hospital, Dhaka, Bangladesh.

³Ex- Professor and Department of Obstetrics & Gynecology, Dhaka medical College Hospital, Dhaka, Bangladesh.

⁴Professor and Head, Department of Obstetrics & Gynecology, Colonel Maleque Medical College Hospital, Manikganj, Bangladesh.

⁵Assistant surgeon, Department of Obstetrics & Gynecology Sheikh Hasina National Institute of Burn & Plastic Surgery, Dhaka, Bangladesh.

⁶Resident Surgeon, Department of Obstetrics & Gynecology, Dhaka medical College Hospital, Dhaka, Bangladesh.

⁷Assistant Registrar, Department of Obstetrics & Gynecology, Bangabandhu Sheikh Mujib Medical College, Faridpur, Bangladesh.

⁸Junior consultant, Department of Obstetrics & Gynecology, Dhaka medical College Hospital, Dhaka, Bangladesh.

*Corresponding author:

Dr. Fatema Akter Doly, Manager, MFPC, Department of Obstetrics & Gynecology, Dhaka medical College Hospital, Dhaka, Bangladesh.

Citation: Dr. Fatema Akter Doly, Dr. Kazi. Mst Sadeka Tamanna, Professor. Dr. Salma Rouf, Professor. Dr. Anwar Begum, Dr. Farzana Mahmood, Dr. Mahbubur Rahman Razeed, Dr. Sarmin Sultana Swarna, Dr. Imran Mahmud. Role of Intracervical Catheterization for Induction of Labour in Case of Intrauterine Fetal Death with History of Previous Caesarean Section. *Obstetrics and Gynecology Research*. 6 (2023): 317-322.

Received: December 18, 2023

Accepted: December 22, 2023

Published: December 29, 2023

Keywords: Intracervical, Catheterization, Induction of Labour, Fetal Death, Caesarean Section

Introduction

The frequency of intrauterine fetal death with a retained fetus varies but is estimated to occur in 1% of all pregnancies. This clinical situation is psychologically stressful for the woman and her family members and for the health professionals. The vast majority (over 90%) of women will start labor within three weeks of intrauterine death [1]. Expectant management remains an acceptable option in some settings for this diagnosis. The cause of intrauterine death is unknown in 25-60% of all cases [2]. In cases where a cause is clearly determined, the cause of intrauterine death can be referred to fetal, maternal, or placental pathology. One potential study evaluated 64.9% of intrauterine deaths to placental pathology. The same study noted higher rates of intrauterine death secondary to placental pathology at late gestational age. Maternal pathology includes prolonged pregnancy (>41 weeks), Diabetes, Systemic lupus erythematosus, phospholipid syndrome, infection, Hypertension, Preeclampsia, Eclampsia, Hemoglobinopathy, advanced maternal age, Rh disease, uterine rupture, maternal trauma or death, Inherited thrombophilias. Fetal pathology includes multiple gestations, intrauterine growth restriction, congenital abnormality, Genetic abnormality, infection, and Hydrops. Placental pathology involves Cord accident, Abruption, Premature rupture of membranes, Vasa previa, Fetomaternal hemorrhage, and Placental insufficiency [3,4,5]. Late fetal deaths currently comprise at least half of perinatal deaths and more than one-third of total fetal and infant deaths in Europe and North America. Little attention has focused specifically on the epidemiology of fetal death separately from neonatal or infant death in developing countries. The bulk of intrauterine deaths are intrapartum and commonly attributed to the avoidable factor. In Contrast, stillbirth in developed countries is largely antepartum with no apparent cause. Many fetal deaths can be attributed to maternal disorders, such as diabetes or hypertensive disease, to fetal pathology, such as congenital anomalies, severe fetal growth restriction (FGR) or cord accident [6,7,8]. When a fetus dies in the uterus, the options for health care are either to wait for the onset of spontaneous labor or to induce labor. The vast majority (over 90%) of women will have labor and deliver within three weeks of intrauterine death. Expectant management remains an acceptable option in some settings for this diagnosis. In cases where expectant management is chosen, the clinical concern will be the development of disseminated intravascular coagulation with its inherent risks of haemorrhage, blood product transfusion and maternal death. The clinical management of intrauterine fetal demise in women with a previous cesarean delivery presents a quandary for the obstetrician. With the current reluctance of obstetricians to perform vaginal birth after cesarean (VBAC)

and the paucity of data to counsel women regarding maternal risks, management options are limited by physician clinical experience and bias. With the rising rate of cesarean delivery now reaching 31.1% and fetal demise occurring in 0.6% of deliveries, the occurrence of a fetal demise in a patient with a prior cesarean delivery is becoming more prevalent [9]. Repeat caesarean section for a dead fetus is not a very acceptable option both for the mother and for the attending obstetricians. However, many clinicians are still unwilling to undertake induction of labour in those women with a history of caesarean section because of fear of scar rupture. The purpose of this study is to characterize management and outcomes, specifically in those women with an intrauterine fetal death and a previous caesarean delivery. A study has shown that a 30-mL to 50-mL Foley catheter filled with saline effectively induces cervical ripening and dilation [10]. The catheter is placed in the uterus, and the balloon is filled. This direct pressure causes stress in the lower uterine segment, and the local production of prostaglandins and labour pain starts to mimic the onset of spontaneous labor.

Methodology & Materials

It was a cross-sectional study. The study was conducted at the Department of Obstetrics and Gynecology, Dhaka Medical College and Hospital, Dhaka. The study lasted six months, from January 2013 to June 2013. Women who were admitted with intrauterine fetal death at 28 weeks or more with a history of previous caesarean delivery not in labour were enrolled in this study.

- **Inclusion criteria:** All pregnant women will be admitted before the onset of labour pains with intrauterine fetal death with previous caesarean delivery.
- **Exclusion criteria:** IUFD without a history of caesarean section IUFDs with a history of multiple caesarean sections that is ≥ 1 CS. IUFD with central placenta praevia IUFD with an unfavorable presentation for induction like a transverse lie.

Procedures for collecting data

Data was collected by using a structured questionnaire (research instrument) containing all the variables of interest. The questionnaires were finalised following pretesting. After taking informed written consent from the eligible patient, her history was taken with particular scrutiny of menstrual and obstetrical history. Physical examinations were performed. The maternal outcome was determined by the mother's generalized condition with complications during and after delivery.

Procedures of data analysis of interpretation

Data analysis was done by using a statistical package for social science (SPSS) software. The test statistics to be used are descriptive statistics as appropriate.

Ethical Implications

- Informed written consent was taken from patients. They were free to withdraw from the study at any time if they desired.
- Permission was taken from the ethical committee of the hospital authority before the study.
- During this study procedure, various complications may arise with the patients, which the researcher herself managed, and the researcher herself also carried out the total expenditure.

Result

Table 1 shows a maximum of 44% belonging to the 26-30 years age group and a minimum of 6% belonging to the age of 35 years. The average age was 28.18 years. The majority of the study population (84%) were housewives (Table 2). 84% of the study population had middle socioeconomic status (Table 3). The majority of patients presented with preterm pregnancy. Table five shows that 31% were second gravida, 17% were third gravida, and 4% were fourth gravida. Table 6 shows that the majority of patients (44%) had no antenatal check-ups, and only 22% had regular antenatal check-ups. Table seven shows that 94% had a spontaneous vaginal delivery, and 6% were delivered by LSCS after induction with a Foleys catheter. Therefore, the success rate was quite good. Table eight shows that the most common cause of intrauterine death was idiopathic (60%), then gestational HTN/pre-eclampsia/severe eclampsia (20%). Table nine shows that the most common indication of caesarean section in previous pregnancies was fetal distress (44%). Table 10 shows 84% delivered within 20 hours and 12% delivered >20 hours. Table 11 shows that 8% had nausea, 8% had shivering, 4% had reduced platelet count, 6% had PPH, 1% had vomiting, 4% had fever, and 4% had chorioamnionitis. Table 12 shows 3 patients with repeat caesarean sections due to chorioamnionitis and impending rupture. Table 13 shows 78% hospital stay in 2 days and 22% hospital stay in 3-4 days.

Table 1: Age distribution of the study population (n=50).

Age in years	Frequency (n)	Percentage (%)	Mean±SD
≤20	5	10	28.18±4.13
21-25	7	14	
26-30	22	44	
31-35	13	26	
36-40	3	6	

Table 2: Occupational status of the study population (n=50).

Occupational status	Frequency (n)	Percentage (%)
Housewife	42	84
Service	8	16

Table 3: Socioeconomic status of the study population (n=50).

Socioeconomic status	Frequency (n)	Percentage (%)
Low	8	16
Middle	42	84

Table 4: Distribution of gestational age (n=50).

Gestational age	Frequency (n)	Percentage (%)
28-30 weeks	13	26
31-33 weeks	20	40
34-37 weeks	17	34

Table 5: Gravida of the study population (n=50).

Gravida	Frequency (n)	Percentage (%)
2nd	31	31
3rd	17	17
4th	2	4

Table 6: Antenatal checkup (n=50).

Age in years	Frequency (n)	Percentage (%)
Regular	11	22
Irregular	17	34
None	22	44

Table 7: Mode of delivery after induction (n=50).

Mode of delivery	Frequency (n)	Percentage (%)
Spontaneous vaginal delivery	47	94
LSCS	3	6

Table 8: Causes of intrauterine death (n=50).

Cause	Frequency (n)	Percentage (%)
Idiopathic	30	60
Gestational HTN/Pre-eclampsia/severe eclampsia	10	20
Hyper pyrexia	2	4
Congenital malformation	3	6
Post maturity	3	6
Severe anaemia	1	2
Rh incompatibility	1	2

Table 9: Indication of previous caesarean delivery (n=50).

Indication	Frequency (n)	Percentage (%)
Malposition & malpresentation	5	10
Prolonged or obstructed labour	5	10
Fetal distress	22	44
Unfavourable cervix	14	28
Placenta previa	4	8

Table 10: Induction delivery interval (n=50).

Interval	Frequency (n)	Percentage (%)
≤20 hours	41	84
>20 hours	6	12

Table 11: Complications (n=50).

Complication	Frequency (n)	Percentage (%)
Nausea	4	8
Shivering	4	8
Reduced platelet count	2	4
PPH	3	6
Vomiting	1	2
Fever	2	4
Chorioamnionitis	1	2
Impending rupture	2	4

Table 12: Reason of failed induction and repeat caesarean section.

Reason	Frequency (n)	Percentage (%)
Chorioamnionitis	1	2
Impending rupture	2	4

Table 13: Duration of hospital stay (n=50).

Hospital stay	Frequency (n)	Percentage (%)
2 days	39	78
3-4 days	11	22

Discussion

This study was designed to evaluate the success rate of intracervical catheterization as a mode of induction of labour in case of intrauterine death (IUD) with a previous history of caesarean section. A total of 50 patients of gestational age ranging from 28 weeks to 37 weeks with IUD with a previous history of one caesarean section were enrolled in this study from the admitted patients in the Department of Obstetrics and Gynaecology, Dhaka Medical College Hospital, Dhaka, from January 2013 to December 2013. Women with unripe cervix were subjected to induction by intracervical catheterization in all cases. The present study findings were discussed and compared with previously published relevant studies. In this study, the mean age of the patients was 28.18±4.13 years, ranging from 18 to 36 years, and more than a half (44%) of the patients belonged to the age group of 26 to 30 years, which was similar to the Nyende et al. showed in their series, the mean age of the patients was 26.3±4.9 years [11]. In a similar type of study by Tahmina H.Z., the maternal age group between 26-30 years and gestational age between 28-37 weeks was observed in 72% and 74% of patients, respectively [12]. Chittacharoen et al. showed in their series that the mean age of the patients was 31.43±6.12 years [13]. On the other hand, Chong et al. observed higher mean age

in Chinese women, which was 32.2 years [14]. They stated that the higher age range might be due to increased life expectancy in Chinese women. In this study, it was observed that nearly half of patients (40%) belonged to 31-33 weeks of gestation, 34% between 33-37 weeks and 26% between 38-42 weeks. These findings agree with Nyende et al.'s study [11]. In this study, it was found that common causes of IUD were idiopathic (60%) and gestational hypertension/preeclampsia/impending eclampsia (20%). Other causes were hyperpyrexia (4%), congenital malformation (6%), postmaturity (6%), severe anaemia and Rh incompatibility (4%). This result was consistent with the study by Mansouri et al., where the idiopathic cause was 40.0% and hypertension/preeclampsia/eclampsia was 36.0% [12]. Another study by Waggrachchi et al. showed that unexplained causes and hypertension in pregnancy were responsible for 54.0% and 12.0% of cases, respectively [15]. Incidence of IUD was higher in primigravid patients (50%), in below average socioeconomic status and in patients who did not take any antenatal checkup. Patients of below-average socioeconomic status do not undergo any antenatal checkups due to a lack of awareness and poverty. Consequently, many risk factors for IUDs may remain undetected, and disaster eventually occurs. Nyende et al. observed that 50.0% of IUDs occurred in primiparous patients, 30.0% in second gravida and 20.0% in third and fourth gravid patients [11]. Chittacharoen et al. observed that the mean parity was 2.05±1.28 [16]. The majority, 42(84%) of the patients, came from the middle-income group in this study, and 16% came from the poor class group. Nearly half of the patients (44%) had no antenatal checkup, 34% had irregular antenatal checkups, and 22% had regular antenatal checkups during their pregnancy period. In this study, the rate of failed induction and repeat caesarean section was 6%. The rate of repeat caesarean section in our study is agreeable (St. et al.; Anthony et al.) [17,18]. There was no increased rate of cesarean section with the intracervical catheter use. In the present study, it was observed that the induction delivery interval was about twenty-six per cent delivered within 20 hours and 74% delivered >20 hours. Similar observations were observed by Dewan et al.[19]. Another study by Sciscione et al. showed 20 20-hour induction delivery intervals [20]. The minimum time requirement was 6 hours, and 'the maximum was 23 hours. There were no major complications of induction, but only minor systemic side effects, namely nausea, shivering, vomiting, and fever, were observed in the majority of the cases. A small number of cases developed reduced platelet count and PPH (postpartum haemorrhage), and 2 patients developed chorioamnionitis. However, no major adverse outcomes such as uterine hyperstimulation, tachysystole or scar rupture were detected in any of the patients. Chittacharoen et al. reported that nausea/vomiting was found in 2.5% of cases, and intramuscular analgesia was needed in 22.5% of cases [21]. Nyende et al. observed no major complications, but only minor systemic side effects

such as vomiting, diarrhoea, and shivering were reported [11]. There were no cases of uterine rupture. Almost similar complications were observed by Dharmavijaya et al. and Barrilleaux et al. [22&23]. This study found a (94%) successful rate of induction with cervical catheterization. Dharmavijaya et al.'s study found (an 81.5%) successful rate of induction with a Foley catheter [22]. Another study by Jagielska et al. reported that the rate of success was 69.4% [24].

Limitations of the study

Every hospital-based study has some limitations and the present study undertaken is no exception to this fact. The limitations of the present study are mentioned. Therefore, the results of the present study may not be representative of the whole of the country or the world at large. The number of patients included in the present study was less in comparison to other studies. Because the trial was short, it was difficult to remark on complications and mortality.

Conclusion and Recommendations

This study shows that intracervical catheterization for labour induction is very effective, shortens the time of induction delivery interval, and should be considered for use in clinical practice. The intracervical catheterization catheter could make it particularly useful in resource-limited settings. This study has also shown that the use of intracervical catheterization to induce labour is very effective and would hardly end in failed induction. Therefore, we recommended that traction be applied to intracervical catheterization when it is being used for pre-induction cervical ripening so as to reduce the induction-delivery interval. The present study was carried out in a small group of patients. To arrive at a definite conclusion, it is suggested that long-term, well-designed clinical trials with a bigger sample size should be carried out to assess the safety, efficacy and acceptability of this induction method.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee.

References

1. Silver TM. Fetal death. *Obstet Gynecol* 109 (2007): 153-167.
2. Korteweg FJ, Erwich JJ, Holm JP, et al. Diverse placental pathologies as the main causes of fetal death. *Obstetrics & Gynecology* 114 (2009): 809-817.
3. Flenady V, Koopmans L, Middleton P, et al. Major risk factors for stillbirth in high-income countries: a systematic review and meta-analysis. *The lancet* 377 (2011): 1331-1340.
4. Stillbirth Collaborative Research Network Writing Group. Association between stillbirth and risk factors known at pregnancy confirmation. *JAMA: the journal of the American Medical Association* 306 (2011).
5. Bukowski R, Carpenter M, Conway D, et al. Causes of Death Among Stillbirths. *Jama [Internet]* 306 (2011): 2459-2468.
6. Cotzias CS, Paterson-Brown S, Fisk NM. Prospective risk of unexplained stillbirth in singleton pregnancies at term: population based analysis. *Bmj* 319 (1999): 287-288.
7. Archibong EI, Sobande AA, Asindi AA. Antenatal intrauterine fetal death: a prospective study in a tertiary hospital in south-western Saudi Arabia. *Journal of Obstetrics and Gynaecology* 23 (2003): 170-173.
8. Huang DY, Usher RH, Kramer MS, et al. Determinants of unexplained antepartum fetal deaths. *Obstetrics & Gynecology* 95 (2000): 215-221.
9. Ramirez MM, Gilbert S, Landon MB, et al. Mode of delivery in women with antepartum fetal death and prior cesarean delivery. *American journal of perinatology* 19 (2010): 825-830.
10. Vaknin Z, Kurzweil Y, Sherman D. Foley catheter balloon vs locally applied prostaglandins for cervical ripening and labor induction: a systematic review and metaanalysis. *American journal of obstetrics and gynecology* 203 (2010): 418-429.
11. Nyende L, Towobola OA, Mabina MH. Comparison of vaginal and oral misoprostol, for the induction of labour in women with intra-uterine foetal death. *East African medical journal* 81 (2004): 179-182.
12. Mansouri M, Pourjavad A, Panahi G. Induction of labor with use of a Foley catheter and extraamniotic corticosteroids. *Medical Journal of The Islamic Republic of Iran (MJIRI)* 17 (2003): 97-100.
13. Chittacharoen A, Herabutya Y, Punyavachira P. A randomized trial of oral and vaginal misoprostol to manage delivery in cases of fetal death. *Obstetrics & Gynecology* 101 (2003): 70-73.
14. Chong YS, Su LL, Arulkumaran S. Current strategies for the prevention of postpartum haemorrhage in the third stage of labour. *Current opinion in obstetrics and gynecology* 16 (2004): 143-150.
15. Wagaarachchi PT, Ashok PW, Narvekar NN, et al. Medical management of late intrauterine death using a combination of mifepristone and misoprostol. *BJOG: an international journal of obstetrics and gynaecology* 109 (2002): 443-447.
16. Chittacharoen A, Herabutya Y, Punyavachira P. A randomized trial of oral and vaginal misoprostol to

- manage delivery in cases of fetal death. *Obstetrics & Gynecology* 101 (2003): 70-73.
17. Onge RD, Connors GT. Preinduction cervical ripening: a comparison of intracervical prostaglandin E2 gel versus the Foley catheter. *American journal of obstetrics and gynecology* 172 (1995): 687-690.
 18. Anthony C, Sciscione DO, Helen M. A prospective, randomized comparison of Foley catheter insertion vs. intracervical PGE2 gel for preinduction cervical ripening. *Am J Obstet Gynecol* 180 (1999): 55-59.
 19. Dewan F, Ara AM, Begum A. Foley's catheter versus prostaglandin for induction of labour. *Singap J Obstet Gynaecol* 32 (2001): 56-63.
 20. Sciscione AC, Muench M, Pollock M, et al. Transcervical Foley catheter for preinduction cervical ripening in an outpatient versus inpatient setting. *Obstetrics & Gynecology* 98 (2001): 751-756.
 21. Wagaarachchi PT, Ashok PW, Narvekar N, et al. Medical management of early fetal demise using a combination of mifepristone and misoprostol. *Human reproduction* 16 (2001): 1849-1853.
 22. Dharmavijaya MN, Umashankar KM, Kavitha G. Abed Gulab Nagure. Comparative study of intra-cervical Foleys catheter and PGE2 gel for preinduction ripening *Int. J. Basic Appl. Med. Sci* 3 (2013): 247-253.
 23. Barrilleaux PS, Bofill JA, Terrone DA, et al. Cervical ripening and induction of labor with misoprostol, dinoprostone gel, and a Foley catheter: a randomized trial of 3 techniques. *American journal of obstetrics and gynecology* 186 (2002): 1124-1129.
 24. Jagielska I, Kazdepka-Ziemińska A, Janicki R, et al. Ocena skuteczności i bezpieczeństwa preindukcji porodu cewnikiem Foley'a. *Ginekol Pol* 84 (2013): 180-185.