

Original Research Article

A STUDY ON MECHANICAL METHOD OF INDUCTION IN SECOND TRIMESTER INTRAUTERINE FOETAL DEATH IN PREVIOUSLY SCARRED UTERUS IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Background: The aim is to compare the outcome of mechanical method of induction in second trimester intrauterine fetal death in previously scarred uterus.

Materials and Methods: A hospital-based cross-sectional analytical study. The study population consisted of 50 multigravida with second-trimester intrauterine fetal death with previously scarred uterus. Modern Government Maternity hospital, Petaburj, Hyderabad, India. All multigravida with second-trimester intrauterine fetal death with previously scarred uterus. The sampling technique used for the present study was a convenient sampling technique. All the eligible patients satisfying the inclusion criteria were selected.

Results: In the present study, About 52% were lower middle class, 12% were upper middle class, 32% were belonged to middle class socio economic class as per Modified Kuppuswamy scale. About 42% were graduate, 32% were plus two, 16% were postgraduate and 10% were educated up to 10th standard. Almost 78% were working and 22% were not working. Induction to abortion time in hrs shows that the mean time was 16.2 (2.1) hours.. 16% had incomplete abortion, 8% had febrile morbidity, 6% had haemorrhage, 4% had ruptured uterus and 20% treatment failure. 10% of the patient underwent hysterotomy. About 24% were admitted to MICU.

Conclusion: Therefore this study concludes that mechanical method of induction can be a safer option considering the dreaded complications associated with operative interventions like hysterotomy.

Keywords: Intra uterine fetal deaths, Kuppuswamy scale, Haemorrhage, Induction of abortion, Hysterotomy.

INTRODUCTION

Regardless of the length of pregnancy, the United States Center for Health Statistics defines foetal death as the birth of a foetus that shows no signs of life, such as absent breathing, heartbeats, pulsations of the umbilical cord, or distinct movements of voluntary muscles. A stillbirth occurs when a foetus dies after reaching a specific gestational age or weight, both of which traditionally lacked consistency. The most widely accepted definition of stillbirth at the moment is a foetal death that takes place at or after 20 weeks of pregnancy or at a birth weight of at least 350 grammes. A current focus is standardising the

definition of stillbirth. According to parent groups, "stillbirth" has supplanted "intrauterine foetal death" as the preferred euphemism. The usage of stillbirth is now being attempted in all scientific articles.^[1] Due to the non-uniformity of the definition of stillbirth and the poor collection of stillbirth data, comparisons of stillbirth rates between and within nations are restricted. Less than 5% of stillbirths are reported globally.^[2] The fifth most common cause of mortality in the world is intrauterine foetal demise. The pathophysiology of foetal death is only partially understood at this time. 76% of all recorded stillbirths in the world are unaccounted for.^[2,3] Global public health initiatives have been supported by the

publication of "The Ending Preventable Stillbirths Series Study Group" in The Lancet. The intended target was to get the stillbirth rate down to about 15 per 1000. This has already been accomplished in many developed nations, but Asia and Africa still have significantly higher stillbirth rates, which are mostly related to poor access to healthcare practitioners. 98% of stillbirths worldwide are thought to take place in low- and middle-income nations.^[4] There are several factors that might lead to stillbirth, including intrapartum problems, high blood pressure, diabetes, infection, congenital and genetic abnormalities, placental failure, and pregnancies that go longer than 40 weeks. This is a catastrophic occurrence that will have long-term effects on society as a whole. We must study more about the causes of stillbirths. This understanding can aid people affected in coping with their loss and, more significantly, can help them be ready to lower the chance of stillbirth in future pregnancies. The role of the healthcare team in assessing, monitoring, and enhancing care for patients who have been diagnosed with stillbirth is covered in this activity. Due to the challenge of establishing causality, there are little global statistics on the causes of stillbirth.^[5] The most often documented cause, which is recorded in 76% of instances globally, is an unexplained stillbirth.^[6] The majority of these deaths would probably be prevented with better access to expert healthcare; however, intrapartum problems are responsible for 50% of stillbirths worldwide.^[2] The most typical stillbirth results include placental anomalies and foetal Fetal growth restriction. However, the majority of pregnancies with these results do not end in stillbirth. Even in stillbirths without obvious signs of growth impairment, placental anomalies can be discovered. Symphysis-fundal height has poor sensitivity and specificity for identifying a newborn that is short for gestational age. It is used to measure serial foetal growth during prenatal visits. Prenatal testing can now only identify placental volume, velamentous insertion, and the presence of a single umbilical artery. It might be challenging to identify fetal growth restriction in pregnancy. To assess the placenta's structure and function without causing harm, new techniques are required.^[1-5] The need for labour induction in a pregnant woman may arise for maternal reasons, like any maternal disease that is aggravated by pregnancy and endangers the mother's life (e.g. Severe pre-eclampsia/eclampsia) or for fetal reasons like compromised baby, intrauterine fetal demise, lethal congenital anomaly, prolonged pregnancy etc.^[6-8] In a previously scarred uterus, option of vaginal delivery needs to be strongly considered especially when a favourable fetal outcome is not guaranteed in situations like cases of severe preeclampsia and eclampsia in a pre-term pregnant patient, women with intrauterine fetal demise etc.^[9-13] Best method, efficacy and safety of cervical ripening and/or labor induction in these women has not been established. An ideal inducing agent needs to have a short induction delivery

interval, least incidence of cesarean section and with no adverse effects for the mother or the baby.^[14,15] Cesarean section is associated with various anesthetic, intraoperative and postoperative complications. These include difficult intubation, total spinal anesthesia, hemorrhage, uterine atony, uterine inversion, injury to the adjacent viscera, PPH, paralytic ileus, atelectasis, wound infections, sepsis, thromboembolism, scar ectopic pregnancy, placenta accreta spectrum etc. For women who have previously undergone a Caesarean section, uterine rupture is a serious worry; according to a population-based retrospective cohort research, the risk of uterine rupture following a prior Caesarean birth was 1.6 per 1,000 women.^[16]

Hence to overcome the above complications mechanical method of induction can be employed. Mechanical method of induction is used when the cervix is unfavourable. A Foley catheter is placed the internal cervical os, and downward tension is created by taping the catheter to the thigh.

Aims and objectives

Aim: To compare the outcome of mechanical method of induction in second trimester intrauterine fetal death in previously scarred uterus.

Objectives

- To determine the success rate of induction with foley's balloon in cases with previously scarred uterus
- To study the complications of foley's induction in previously scarred uterus.

MATERIALS AND METHODS

Study design: A hospital-based prospective observational study.

Study population: The study population consisted of 50 multigravida with second-trimester intrauterine fetal death with previously scarred uterus.

Study setting: Modern Government Maternity hospital, Petaburj, Hyderabad, India.

Study duration: This study was conducted between October 2020 and October 2022.

Inclusion criteria

All multigravida with second-trimester intrauterine fetal death with previously scarred uterus.

Exclusion criteria

- Primi and multigravida with live fetus
- Primigravida with intrauterine fetal death
- Multigravida with first and third-trimester intrauterine fetal demise
- Multigravida with intrauterine fetal death with previously unscarred uterus.

Data collection: Data collection period was two year. After obtaining written consent from the participant, the investigator I conducted an interview for collecting information on sociodemographic and clinical characteristics. I introduced myself and established a good rapport with the study participants. The desire for conducting the study was explained to them. It was assured to them that all data would be

kept strictly confidential and used only for the study purpose. A pretested semi-structured questionnaire was used to assess the sociodemographic and clinical characteristics. Patients' case records were reviewed to get the details of their treatment history. All the women in the study were followed up till delivery to measure the outcomes. During the follow-up period, maternal ICU admission were assessed.

Independent Variables

- Age
- Gestational age
- Education
- Socio economic status
- Occupation
- Gravida

Outcome Measures

- Fetal anomaly
- Induction to abortion time
- Delivery within 24h
- Complications
- Hysterotomy done
- MICU Admissions

Data Management and Statistical Analysis: Data were entered into Microsoft excel and analysis was done using STATA version 14. Categorical variables such as Age, Gestational age, Religion, Education, Socio economic status, Occupation, Parity, Gravida, Previous CS, Fetal anomaly, Induction to abortion time, Delivery within 24h, Complications, Hysterotomy done, and Maternal ICU admissions were summarised as frequencies percentages.

Ethical issues: The ethical approval was obtained from the Institutional Review Board (IRB) of Osmania Medical College, Hyderabad. Written informed consent was obtained from each participant who participated in the research study before enrolling. All information related to the study participants was kept confidential and de-identified data was used for analysis.

RESULTS

The total sample size of the patients in this study was 50 and the distribution of sociodemographic, clinical and outcome characteristics of the patients are shown the following tables.

Table 1: Distribution of age (N=50)

Age in years	N	%
<20	6	12.0
21-29	27	54.0
30 and above	17	34.0
Total	50	100

The distribution of age of the patients is shown in Table 1. The mean (SD) age of the participants was 26.4 (4.7) years. There were 54% (n=27) of the

patients belonged to the age category 21-29 years, and 12% (n=6) aged less than 20 years and 34% (n=17) aged above 30 years.

Table 2: Distribution of gestational age (N=50)

Gestational age in weeks	N	%
<19	4	8.0
19-21	28	56.0
22-24	18	36.0
Total	50	100

The distribution of gestational age of the patients is shown in Table 2. About 56% (n=28) were belonged to 19-21 weeks of gestation, 36% (n=18) belonged to

22-24 weeks of gestation and 8% (n=4) were <19 weeks of their gestation.

Table 3: Distribution of socioeconomic status (N=50)

SES	N	%
High	2	4.0
LM	26	52.0
Middle	16	32.0
Upper middle	6	12.0
Total	50	100

The distribution of SES of the patients is shown in [Table 3]. About 52% were lower middle class, 12% were upper middle class, 32% were belonged to

middle class socio economic class as per Modified Kuppuswamy scale.

Table 4: Distribution of education (N=50)

Education	N	%
10	16	32.0
Plus 2	8	16.0
Graduate	21	42.0
Postgraduate	5	10.0
Total	50	100

About 42% were graduate, 32% were plus two, 16% were postgraduate and 10% were educated up to 10th standard.

Table 5: Distribution of occupation(N=50)

Occupation	N	%
Not working	14	28.0
Working	36	72.0
Total	50	100

Table 6: Distribution of gravida (N=50)

Gravida	N	%
2	28	56.0
3	7	14.0
4	10	20.0
5	5	10.0
Total	50	100

Table 7: Distribution of fetal anomaly(N=50)

Fetal anomaly	N	%
Yes	31	62.0
No	19	38.0
Total	50	100

Table 8: Distribution of induction to delivery time in hrs(N=50)

	Mean	SD
Inductiontoabortiontime in hrs	16.2	2.1

Table 9: Distribution of delivery within 24 hours (N=50)

Delivery within 24 hours	N	%
Yes	31	62.0
No	19	38.0
Total	50	100

Table 10: Distribution of complications (N=50)

Complications	N	%
Febrile morbidity	4	8.0
Haemorrhage	3	6.0
Ruptured uterus	2	4.0
Failed MME	10	20.0
incomplete abortion	8	16.0
Total	50	100

Table 11: Distribution of hysterotomy (N=50)

Hysterotomy	N	%
Yes	10	20.0
No	40	80.0
Total	50	100

Table 12: Distribution of MICU admission(N=50)

MICU admission	N	%
Yes	12	24.0
No	38	76.0
Total	50	100

DISCUSSION

Studies on labour induction in a scarred uterus, a challenging situation are yet to come out with clear cut recommendations and the best method of induction. But, however various studies including large scale multicentric studies are trying to prove the safety of labour induction in previously scarred uterus. ACOG clearly not recommending induction in a uterus with two previous caesarean scars, most of the studies have been done on patients with previous one scar but recommends that induction should be an open for women willing for TOLAC. When stillbirth occurs, the emphasis changes to maternal morbidity. In women who intend to have

more children, repeat caesarean deliveries have a higher risk of uterine rupture, placenta accreta, and morbidity from numerous abdominal procedures. Compared to women who repeatedly have caesarean deliveries, women who deliver successfully vaginally typically experience less postpartum discomfort, shorter hospital stays, and shorter durations of impairment.

The present hospital based prospective study was conducted among pregnant women with second trimester IUFD with previously scarred uterus in a territory care hospital in Telangana, South India. The study was conducted to determine the success rate of induction with Foley's balloon and its complications. A total of 50 women participated in the study with a

success rate of 100%. Foley and oxytocin were compared in a research by Meetei et al.^[2] to induce labour in women who had already had one caesarean surgery. The authors reported that the Foley group had a success rate of 66.7% with 30 women in each group. Up to 34miu/min of oxytocin was used. The VBAC rates were low in the randomised experiment conducted in Medical College Vellore, India, by Manish et al., at 19.5% in the 80 ml inflation group and 23.4% in the 30 ml inflation group. The 80 ml group noted a high rate of scar dehiscence of 9.1%. Only one insertion and 12 hours of balloon usage were completed. In Himachal Pradesh, a study looked at TOLAC in 482 women who had undergone a c-section in the past. However, only 14 of the 34 women who had labour induction gave birth vaginally (a 41% success rate for VBAC in the induced group). They noticed that 4% of cesarean-section patients experienced a scar dehiscence.^[17]

In our study, 16% had incomplete abortion, 8% had febrile morbidity, 6% had haemorrhage, 4% had rupture uterus and 20% had treatment failure (underwent hysterotomy). About 24% were admitted to MICU. As our study population is from tertiary care centers and may include women with other risk factors for poor outcomes, comparison to other settings must be done with caution. At a facility with less resources available for the care of these women, it is not predicted that labour outcomes will be better. Catastrophic morbidity may be linked to uterine rupture. A US study,^[11] found no difference in rupture rates between spontaneous and induced labours but found a significantly greater vaginal birth rate following spontaneous labor. Contrary to this, a study by Fitzpatrick et al showed an increased risk with induction. In 2000, a Norwegian study on 18794 patients with CS, resulted in 94 uterine ruptures accounting to 0.5%. They recommended that if needed mechanical method of induction should be used instead of medical induction by prostaglandins.^[12] With 225 patients induced with Foley's Balloon with previous caesarean section, no increased rupture was demonstrated in another study by Bujold et al.^[18]

The US-based NICHD group evaluated prospectively women who had previously had caesarean delivery. When compared to mechanical methods of induction, such as the Foley catheter, in this study, inducing labour after taking prostaglandin medication was associated with a non-significant increase in risk of uterine rupture (risk of uterine rupture 140 per 10,000 inductions following PGE2 compared with 89 per 10,000 inductions following mechanical dilation of the cervix with a Foley catheter).^[19] On the other hand, Scottish data from more than 36,000 women who had previously undergone caesarean deliveries, of whom 4600 had their labours induced using prostaglandins, showed an increased risk of uterine rupture and perinatal death after prostaglandin induction (risk of uterine rupture was 4.5 per 10,000 non-induced labours versus 11 per 10,000 labours

induced with prostaglandins in women who had previously undergone caesarean).^[18,20]

At a retrospective cohort analysis, all births between 1992 and 1998 in a Canadian hospital were examined by Raviyas et al.^[21] In this study, two of 274 women who did not need cervical ripening (0.73%) and five of 172 women who received induction with prostaglandins (2.9%) experienced uterine rupture, compared to one of 129 women who underwent induction with a Foley catheter (0.78%), Bujold and colleagues found a comparable incidence of uterine rupture with Foley catheter induction and spontaneous commencement of labour (1.78% versus 1.2%) in a trial that compared mechanical cervical dilatation in women who had previously undergone a caesarean surgery.^[18]

We found induction with Foley to be extremely safe for carefully selected women who had undergone one lower-segment caesarean operation in second trimester intrauterine fetal death in previously scarred uterus. Strict monitoring and induction procedures, as well as careful selection of women for induction of labour, are linked to little to no difficulties for the mother.

Limitations

1. The Present study doesn't include fetal outcome as a parameter as the indication is IUFD.
2. The Sample size is limited.
3. The Study doesn't include pregnant mother at term gestation which can have major influence on the success of induction.

CONCLUSION

The present study has shown a success rate of 80% for mechanical method of induction, hence avoiding the need for surgical intervention. The induction to delivery interval for 62% cases was less than 24 hours. Therefore this study concludes that mechanical method of induction can be a safer option considering the dreaded complications associated with operative interventions like hysterotomy.

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