INTRACERVICAL FOLEY CATHETER: A VIABLE OPTION FOR LABOR INDUCTION POST-CESAREAN SECTION

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ABSTRACT

Introduction: The intracervical Foley catheter's effectiveness in inducing labour in women who have undergone one caesarean section has been the subject of extensive research. This approach is even more relevant given the rising rates of caesarean section and the imperative for safe induction practice amongst this population. The Foley catheter is a mechanical device that is essential for females who are striving for a vaginal birth after caesarean (VBAC) in order to promote cervix ripening and facilitate labour induction.

Objective: To evaluate the efficacy of the Intracervical Foley Catheter for labour induction in patients with a history of one caesarean surgery.

Material And Methods: This quasi-experimental study was undertaken in the Department of Obstetrics and Gynaecology at Qazi Hussain Ahmed Medical Complex in Nowshera from October 2023 to April 2024. Labour was induced in all research patients using a size 18 single balloon Foley catheter for those who met the eligibility criteria following a thorough history and clinical evaluation. Under rigorously aseptic settings, we introduced a catheter into the intracervical canal beyond the internal cervical os and infused the bulb with water under pressure ranging from 30 to 60 cm^3. During the subsequent 24 hours, we did not remove the catheter unless it dislodged spontaneously. The efficacy of the balloon foley catheter was assessed based on the incidence of vaginal delivery following a caesarean section.

Results: The study indicates a mean age of 30 years with a standard deviation of ± 8.12. Among the patients, 44 (34%) were at a gestational age of 37-38 weeks, while 85 (66%) were at 39-41 weeks. Seventy-nine (61%) patients had a BMI of ≤27 kg/m^2, while fifty (39%) patients had a BMI exceeding 27 kg/m^2. The intracervical Foley was efficacious in 93 patients (72%) and ineffective in 36 individuals (28%).

Conclusion: In light of the findings obtained in the course of the present study, we found that intracervical Foley catheter is a reasonably safe option for women who had previous one caesarean section.

Keywords: Intracervical Foley Catheter, Induction of labour, Previous one caesarean section

INTRODUCTION

There is vast evidence for using intracervical Foley catheter for labour induction in women with previous history of one caesarean section. This method is even more applicable now, given the rising trends in reoccurrence of caesarean deliveries and necessity of safe inductions in this circle. This Foley catheter is a mechanical tool for cervical 'softening' and thus aiding the labour initiation, which is important for women who want a trial of labour after caesarean (TOLAC).

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The review concludes that the Foley catheter has some benefits that make its use preferable to other means of cervical ripening, including prostaglandins, in an attempt to minimize uterine rupture risk. For example, one systematic review identified extremely low rates of uterine rupture – at 0.5% in some cases – in women who have had a previous cesarean section who used a Foley catheter. (1,2) This is especially crucial since where there is threatened uterine rupture there are high risks for the mother as well as the fetus during labor induction. Additionally, research has shown that the Foley catheter is useful in order to facilitate the vaginal births. This Foley catheter was as effective as other methods for inducing labour as demonstrated by dinoprostone and misoprostol studies with similar success rate of vaginal delivery (3, 4). For instance, the pilot surveyed established that Foley catheter specifically in cervical ripening had equally similar induction to delivery time ratio and outcome as other agents. This implies that it is

safe method of initiating labor in this group of women (3, 4).

Foley catheter is another induction method that has been studied in combination with oxytocin and the studies show that this method is beneficial in that it makes the process easier without increasing the rate of cesarean section. (5). This is especially important for a woman with the Bishop score suggesting a suboptimal cervix since the Foley catheter offers mechanical dilation of the cervix and may decrease the odds of needing a surgical augmentation. (6)

As for the safety, although Foley catheter is rather innocuous, there are certain complications of its use, including infection, and chorioamnionitis in particular (7). However, these risks are felt to be less severe than the risks of undergoing a further cesarean section. From an analysis of these studies, one can deduce that Foley catheter use in labour induction in women with a history of previous Caesarean section is safe, effective and carries lower cost compared to other methods of induction [7].

Prophylactic use of pharmacologic agents for labour induction in women who have had a previous caesarean section is difficult because of the risk of uterine scar dehiscence. These risks may be lowered by the intracervical Foley catheter, a mechanical method. However, its safety and efficacy in this high risk population have not been investigated enough. It is hoped that this study will quantify its efficacy as a safer mode of delivery, which may therefore also reduce the incidence of caesarean section and consequential deliveries.

MATERIAL AND METHODS

This quasi-experimental study was performed in the Department of Obstetrics & Gynaecology, Qazi Hussain Ahmed Medical Complex, Nowshera. The study period was 6 months, from October 2023 to April 2024. The sample size was determined using the WHO technique for sample size calculation, using a 95% confidence interval, an absolute precision of 8%, and an anticipated proportion of 69.1% (8)(success rate of vaginal delivery following a previous C-section use an intracervical Foley catheter). The whole sample size was 129. A non-probability consecutive sampling method was employed for data collecting. All women aged 18 to 35 exhibited singleton pregnancies, were multigravid, had a history of caesarean section, and had a gestational period exceeding 37 weeks. The study excluded women induced by alternative methods (e.g., oxytocin injection or artificial rupture of membranes), primigravida, and patients with contraindications to induction.

The hospital's ethics and research committee provided previous approval for the current investigation. All patients who satisfied the inclusion criteria were enrolled in the study via the emergency department, outpatient department, and the Obstetrics and Gynaecology Department at Qazi Hussain Ahmed Medical Complex, Nowshera. We elucidated the study's objectives and advantages to all ladies, assuring them that its exclusive aim is research and data dissemination. We elucidated the dangers and benefits to all ladies and secured their informed written consent upon agreement.

All participating patients had a comprehensive medical history, clinical assessment, abdominal and vaginal examinations, along with all baseline investigations. We utilised a size 18 single balloon Foley catheter for labour induction in all participating patients. We inserted the catheter under sterile conditions into the intracervical canal, beyond the internal cervical opening, and inflated the bulb with 30–60 cm^3 of water. The catheter was retained for 24 hours, unless it dislodged spontaneously prior to that time. The trainee executed all procedures under the oversight of a qualified consultant (FCPS). The effectiveness of a balloon foley catheter was assessed regarding the VBAC success rate. We documented all the aforementioned information, including age, gestational age, and BMI, on the pre-designed proforma (attached). We rigorously followed the exclusion criteria to eliminate bias in the study outcomes. We input the data gathered on Proforma into the statistical software SPSS version 23. We calculated the mean and standard deviation for continuous variables including age, gestational age, weight, height, and BMI. We calculated frequencies and percentages for categorical variables, including efficacy. We stratified efficacy by age, gestational age, and BMI to discover effect modifiers. A post-stratification chi-square test was conducted, with a P value of ≤0.05 deemed significant.

RESULTS

This study evaluated the age distribution of 129 patients, revealing that 36 (28%) were aged 18–27 years, while 93 (72%) were aged 28–35 years. The average age was 30 years, with a standard deviation of ± 8.12. Table 1

The gestational period status of 129 patients was examined, revealing that 44 (34%) had a

period of gestation (POG) of 37-38 weeks, while 85 (66%) had a POG of 39-41 weeks. Table No. 2 The BMI status of 129 patients was evaluated, revealing that 79 (61%) had a BMI of ≤27 kg/m2, while 50 (39%) had a BMI of >27 kg/m2. Table No. 3 We evaluated the efficacy of the intracervical Foley catheter in 129 individuals, determining it to be effective in 93 (72%) and ineffective in 36 (28%). Table No. 4 Tables 5-7 delineate the efficacy of the intracervical Foley catheter according to age, gestational age, and BMI.

TABLE No. 1 AGE DISTRIBUTION
(n=129)

AGE (in Groups)	FREQUENCY	PERCENTAGE
18-27 years	36	28%
28-35 years	93	72%
Total	**129**	**100%**

Mean age was 30 years with SD ± 8.12

TABLE No. 2 PERIOD OF GESTATION
(n=129)

GESTATIONAL AGE	FREQUENCY	PERCENTAGE
37-38 weeks	44	34%
39-41 weeks	85	66%
Total	**129**	**100%**

Mean POG was 38 weeks with SD ± 3.08

TABLE No. 3 BMI DISTRIBUTION

(n=129)

BMI (in Groups)	FREQUENCY	PERCENTAGE
≤ 27 Kg/m^2	79	61%
>27 Kg/m^2	50	39%
Total	**129**	**100%**

Mean BMI was 28 Kg/m^2 with SD ± 3.49
Mean weight was 78 Kgs with SD ± 9.91
Mean height was 1.5 meters with SD ± 0.14

TABLE No. 4 EFFICACY

(n=129)

EFFICACY	FREQUENCY	PERCENTAGE
Effective	93	72%
Not effective	36	28%
Total	**129**	**100%**

TABLE NO: 5 STRATIFICATION OF EFFICACY WITH RESPECT TO AGE DISTRIBUTION

(n=129)

EFFICACY	18-27 years	28-35 years	Total	P Value
Effective	28(78%)	65(70%)	93	0.3704
Not effective	8(22%)	28(30%)	36	
Total	**36(100%)**	**93(100%)**	**129**	

TABLE NO: 6 STRATIFICATIONS OF EFFICACY WITH RESPECT TO PERIOD OF GESTATION

(n=129)

EFFICACY	37-38 weeks	39-41 weeks	Total	P Value
Effective	34(77%)	59(69%)	93	0.3453
Not effective	10(23%)	26(31%)	36	
Total	**44(100%)**	**85(100%)**	**129**	

TABLE NO: 7 STRATIFICATIONS OF EFFICACY WITH RESPECT TO BMI DISTRIBUTION

(n=129)

EFFICACY	≤ 27 Kg/m^2	>27 Kg/m^2	Total	P Value
Effective	59(75%)	34(68%)	93	0.4096
Not effective	20(25%)	16(32%)	36	
Total	**79(100%)**	**50(100%)**	**129**	

DISCUSSION

The study evaluated an intracervical Foley catheter for labour induction in 129 patients with a history of caesarean deliveries. The outcomes show high efficacy of 72% which is consistent with the literature that Foley catheters are safe and effective for cervical ripening and labour induction among women with prior caesarean section. The distribution of age, revealed that majority of patients (72%) were in the age group of 28-35 years with mean age 30 (± 8.12) years. This age range is consistent with women who undergo labour induction; therefore, the results are generalizable to the reproductive-age women. A POG of 39–41 weeks was present in the majority of the patients (66%) and 34% had a POG of 37–38 weeks. This distribution conforms to clinical practice where induction of labour at or after 39 weeks is encouraged to decrease perinatal morbidity and mortality. (9) in this study, 61% of the patient had a BMI ≤27 kg/m2 and 39% of the patients had BMI >27 kg/m2. The usage of the Foley catheter was not impacted by BMI meaning that it can be effectively used for different BMI classes.

Given that the intracervical Foley catheter has a high success rate in cervical ripening, it is useful as the initial technique of choice in cases of primary cesarean section history.It also bears the advantage of relative safety and has statistically lesser propensity to lead to increased uterine contractility than pharmacological methods. (7, 10) Patients, particularly those with a previous obstetric history of CS, should be informed of the high We suggest that further research should be undertaken with more significant populations and patients of diverse age, sex, and its status to support these findings and to further investigate the use of Foley catheters in different environments.

Although the sample size of 129 patients might seem fairly large, the results of the study cannot be achieved in all the population. The study of

a single center may reduce the applicability of the results. For generalization, we suggest the use of multi-center trials. The study design also did not address randomizations to maintain an equivalent distribution hence the possibility of selection bias. Future works should try to use randomized controlled trials to confirm these results. Infertility, cervical trauma and maternal and neonatal complications which may occur after Foley catheter use were not documented hence the study lacked follow-up data which is very essential when evaluating the safety and efficacy of Foley catheter.

By not overcoming these limitations and adopting the above recommendations, subsequent studies can produce more valid data on the outcome and risks associated with intracervical Foley catheter use in women who present for labor induction after having a previous cesarean section.

CONCLUSION

Therefore, the intracervical Foley catheter is a worthy proposition for use in labor induction in patients with one prior cesarean section. Its mechanical properties, along with the low risk of complications and the similar effectiveness to pharmacological agents, make it an indispensable instrument in obstetrics. Further research should extend to monitor its effects in the long-term and to establish the possible benefits that it has over the use of chemical control.

REFERENCES

1. Vecchioli E., Cordier A., Chantry A., Benachi A, & Monier I.. Maternal and neonatal outcomes associated with induction of labor after one previous cesarean delivery: a french retrospective study. Plos One 2020;15(8):e0237132. https://doi.org/10.1371/journal.pone.0237132
2. Jozwiak M., Lest H., Burger N, Dijksterhuis M. , & Leeuw J.. Cervical ripening with foley catheter for induction of labor after cesarean section: a cohort study. Acta Obstetricia Et Gynecologica Scandinavica 2014;93(3):296-301. https://doi.org/10.1111/aogs.12320
3. Masood A. Intracervical foley catheter versus vaginal prostaglandins for induction of labor in women with previous one cesarean section-a pilot study. Obstetrics &Amp; Gynecology International Journal 2015;2(5). https://doi.org/10.15406/ogij.2015.02.00054
4. Garg R, Agarwal R. , Yadav A. , & Sharma D.. A comparison of different methods of induction of labor in patients of previous cesarean section. Journal of South Asian Federation of Obstetrics and Gynaecology 2023;15(5):580-584. https://doi.org/10.5005/jp-journals-10006-2287
5. Maa A, S J, Abedi P, & Faal. Concurrent administration of oxytocin with foley catheter versus misoprostol for induction of labor: a systematic review. 2020. https://doi.org/10.21203/rs.2.20722/v1
6. Aziz M, S J, Abedi P. , & Faal S.. Concurrent administration of oxytocin with foley catheter versus misoprostol for induction of labor: a systematic review and meta-analysis. 2020. https://doi.org/10.21203/rs.2.20722/v2
7. Nasreen N. , Parveen S. , Kulsoom U. , & Firdaus U.. Dinoprostone vaginal insert vs intracervical foley catheter for preinduction cervical ripening in women with previous cesarean section. Journal of South Asian Federation of Obstetrics and Gynaecology 2023;14(6):672-675. https://doi.org/10.5005/jp-journals-10006-2153
8. Gonsalves H., Al-Riyami N., Al-Dughaishi T., Gowri V., Al-Azri M., & Salahuddin A.. use of intracervical foley catheter for induction of labour in cases of previous caesarean section: experience of a single tertiary centre in oman. sultan qaboos University Medical Journal [squmj] 2016;16(4):e445-450. https://doi.org/10.18295/squmj.2016.16.04.007
9. RamyaMohana, V.A., Dorairajan, G. Outcome of Induction of Labor with Foley's Catheter in Women with Previous One Cesarean Section with Unfavorable Cervix: An Experience from a Tertiary Care Institute in South India. *J Obstet Gynecol India* **72**, 26–31 (2022). https://doi.org/10.1007/s13224-021-01459-0
10. West H., Jozwiak M., & Dodd J. methods of term labour induction for women with a previous caesarean section. cochrane database of systematic reviews 2017;2017(6). https://doi.org/10.1002/14651858.cd009792.pub3