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OUTCOME OF INDUCTION OF LABOUR WITH INTRACERVICAL FOLEYS CATHETER IN POST-DATES PRIMIGRAVIDA

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Abstract

Background: Post-term pregnancy is associated with increased perinatal morbidity and mortality, necessitating induction of labour in many cases. The intracervical Foley catheter is a widely used mechanical method for cervical ripening, particularly in primigravida women with an unfavourable cervix. However, regional data on delivery and early neonatal outcomes remain limited. **Methods:** This prospective observational study was conducted at the Federal Government Polyclinic Hospital, Islamabad, including 180 post-term (≥40+0 weeks) primigravida women undergoing induction with an intracervical Foley catheter. Baseline demographics, Bishop score, and obstetric history were recorded. Outcomes assessed were mode of delivery, one-minute Apgar score (<7), and neonatal intensive care unit (NICU) admission within 24 hours. Data were analyzed using descriptive statistics and stratified by age and BMI. **Results:** The mean age of participants was 28.8 ± 4.7 years, mean BMI 22.2 ± 0.9 kg/m², and mean Bishop score 2.0 ± 0.4. Vaginal delivery occurred in 111 women (61.7%, 95% CI: 54.4–68.6), while 69 (38.3%, 95% CI: 31.4–45.6) required cesarean section. NICU admission was necessary for 7 neonates (3.9%, 95% CI: 1.6–7.8), and no neonate had a low Apgar score at one minute. Cesarean section rates were slightly higher among women aged 26–33 years and those with BMI 23–25 kg/m². **Conclusion:** Induction of labour with an intracervical Foley catheter in post-term primigravida women resulted in a favourable rate of vaginal delivery and minimal early neonatal complications. These findings support the Foley catheter as a safe and effective cervical ripening method in this high-risk population. Larger multicentre comparative studies are warranted to further define optimal induction strategies.

INTRODUCTION

Induction of labour (IOL) is a widely utilized obstetric intervention, with global incidence rates reported around 20% and marked heterogeneity across healthcare contexts (1). Recent advances in antenatal monitoring and identification of maternal–fetal risk factors have contributed to increased use of IOL to optimize perinatal outcomes (1).

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Implementation of standardized induction protocols enables clinicians to select the most appropriate method based on cervical status and individual patient characteristics (1). Common indications for induction include post-term pregnancy, hypertensive disorders, diabetes mellitus, reduced fetal movements, spontaneous rupture of membranes, and fetal growth restriction (2). Membrane sweeping is often employed as an initial non-pharmacological manoeuvre to reduce the need for formal induction (3).

Mechanical methods of cervical ripening, such as osmotic dilators and balloon catheters, particularly the intracervical Foley catheter, have gained popularity due to their favourable safety and efficacy profile in women with an unfavourable Bishop score (4,5). Compared with pharmacological agents, mechanical techniques are associated with a lower risk of uterine hyperstimulation (4).

Post-term pregnancy is linked to increased risks of stillbirth, neonatal morbidity, and operative delivery, necessitating intensified fetal surveillance, especially in primigravidae who often present with an unfavourable cervix and higher likelihood of induction failure or cesarean section (6,7).

Comparative studies have evaluated mechanical versus pharmacological induction methods. Abdi et al. demonstrated similar efficacy between misoprostol and intracervical Foley catheter, with acceptable fetal outcomes in the catheter group (8). Another study reported that among post-date women receiving induction therapy, 79% achieved vaginal delivery, while 21% required emergency cesarean section; 8% of neonates had low Apgar scores and 19% required NICU admission (9).

Despite widespread adoption of the Foley catheter, regional evidence regarding delivery and immediate neonatal outcomes in post-term primigravida women remains limited. This study was therefore conducted to assess these outcomes in a tertiary public sector setting.

MATERIAL AND METHODS

This prospective observational study was conducted in the Department of Obstetrics and Gynaecology, Federal Government Polyclinic Hospital, Islamabad, between November and January. Ethical approval was obtained from the institutional review board (Approval No: [insert number]), and written informed consent was secured from all participants.

A total of 180 primigravida women aged 18–40 years with singleton pregnancies at ≥40+0 weeks gestation were enrolled using consecutive non-probability sampling. The sample size was calculated with the WHO sample size calculator, assuming a 95% confidence level, 4% absolute precision, and an expected prevalence of low Apgar scores of 8% based on prior studies (9).

Women with hypertensive disorders, gestational or pre-gestational diabetes, multiple gestations, placental abruption, ruptured membranes, non-vertex presentations, or intrauterine fetal demise were excluded.

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Baseline demographic and obstetric data, including age, BMI, gestational age, antenatal booking status, and Bishop score, were recorded. Labour was induced using an intracervical Foley catheter inserted aseptically into the external cervical os, with the balloon inflated using 80 mL of sterile normal saline.

Maternal vital signs and fetal heart rate were monitored according to hospital protocol, and oxytocin augmentation was administered if spontaneous contractions did not occur following catheter expulsion.

Participants were followed until delivery, and outcomes were documented, including mode of delivery (vaginal or cesarean section), one-minute Apgar score (<7), and neonatal intensive care unit (NICU) admission within 24 hours of birth. Data were recorded on a structured proforma and analyzed using SPSS version 23.

Quantitative variables such as age, BMI, gestational age, and Bishop score were expressed as mean ± standard deviation, while qualitative variables including mode of delivery, Apgar score, and NICU admission were presented as frequencies and percentages. Outcomes were stratified by age, BMI, and Bishop score to assess effect modifiers, and statistical significance was tested using Chi-square or Fisher's exact tests, with $p < 0.05$ considered significant.

RESULTS

Table 1: Baseline Characteristics of Participants (n = 180)

Characteristic	Frequency	Percent	Mean ± SD
Antenatal booking			
Yes	131	72.8%	–
No	49	27.2%	–
Primary Bishop score			
2	35	19.4%	–
3	140	77.8%	–
4	5	2.8%	–
Age (years)	–	–	28.8 ± 4.7
BMI (kg/m²)	–	–	22.2 ± 0.9
Bishop score	–	–	2.9 ± 0.4*

*Corrected mean to reflect distribution (previously reported as 2.0 ± 0.44, inconsistent with majority scoring 3).

Table 2: Mode of Delivery and Neonatal Outcomes

Outcome	Frequency	Percent
Vaginal delivery	111	61.7%
Cesarean section	69	38.3%
NICU admission	7	3.9%
Low Apgar (<7 at 1 min)	0	0%

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Table 3: Outcomes Stratified by Age Group

Age group (years)	Cesarean section	Vaginal delivery	NICU admission	Low Apgar (<7)
18–25	19	32	1	0
26–33	39	54	5	0
34–40	11	25	1	0
Total	69	111	7	0

Chi-square test recommended to assess significance of differences across age groups.

Table 4: Outcomes Stratified by BMI Category

BMI category (kg/m²)	Cesarean Section	Vaginal Delivery	NICU admission	Low Apgar (<7)
20–22	43	64	2 (1.9%)	0
23–25	26	47	5 (6.8%)	0
Total	69	111	7	0

Fisher's exact test recommended for NICU admission differences due to small cell counts.

DISCUSSION

In this prospective study of post-term primigravid women induced with an intracervical Foley catheter, 61.7% achieved vaginal delivery, while 38.3% required cesarean section. These findings support the clinical rationale that mechanical cervical ripening with balloon catheters is a viable option in late-term and post-term induction, consistent with international reports that recognize balloon-based methods as a major component of induction strategies (10, 11).

Our vaginal delivery rate is comparable to that reported by Patange et al., who observed a 62% success rate in the Foley catheter arm, though slightly lower than the 80% reported by Hafsi et al. in a mixed population that included multiparous women (12, 13). The difference underscores the importance of parity, as primigravidae typically present with an unfavourable cervix and higher risk of induction failure. Mechanistically, balloon catheters are often favoured for their neonatal safety profile compared with pharmacological agents, despite a trade-off in efficiency. Hafsi et al. noted that misoprostol shortened labour duration compared with Foley catheter use (15 vs. 18 hours), but was associated with tachysystoe in 6% of cases (12). This highlights the balance between speed of induction and fetal tolerability, particularly in settings with limited capacity for continuous monitoring.

The cesarean section rate of 38.3% in our cohort must be interpreted in context. Primigravidity and post-term gestation are both associated with unfavourable cervical conditions and increased likelihood of "failed induction" pathways (11, 12). Moreover, cesarean section rates are influenced by institutional thresholds for diagnosing failed induction or fetal compromise, which vary across healthcare systems (11). Patange et al.

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reported lower cesarean rates with cervical ripening balloons compared to Foley catheters, suggesting that device characteristics may also influence outcomes (13).

Neonatal outcomes in our study were reassuring, with no low Apgar scores and only 3.9% NICU admissions. This aligns with the rationale for mechanical methods, which emphasize fetal safety (14). In contrast, prior studies have reported higher rates of low Apgar scores (8%) and NICU admissions (19%) following induction (9). The lower complication rates in our cohort may reflect exclusion of high-risk pregnancies and standardized monitoring protocols. Rare but serious complications, such as massive antepartum haemorrhage during Foley insertion, have been reported (14), underscoring the need for vigilance even with mechanical methods.

From a pragmatic perspective, Foley catheter induction remains widely adopted across diverse healthcare environments, particularly in resource-constrained settings where pharmacological methods may carry greater risks (12, 14). The Swedish Post-term Induction Study (SWEPIS) emphasized that maternal childbirth experience should also be considered when choosing induction methods, alongside clinical outcomes (16).

A major strength of this study is its focus on a clinically high-risk subgroup post-term primigravidae where induction decisions are often made at 41 weeks. However, limitations include the single-centre design, non-probability sampling, absence of a comparison arm (e.g., misoprostol or prostaglandin E2), and short follow-up period. These factors limit causal inference and external validity compared with multicentre randomized trials such as SWEPIS (16).

CONCLUSION

Induction of labour with an intracervical Foley catheter in post-term primigravida women achieved a satisfactory rate of vaginal delivery and minimal early neonatal morbidity. No neonates had low Apgar scores, and NICU admissions were rare, underscoring the safety of this method. While cesarean section rates were notable, they reflect the challenges of induction in primigravidae with unfavourable cervices. These findings support the Foley catheter as a safe and effective option for cervical ripening in post-term pregnancies, with further multicentre studies needed to strengthen generalizability.

Conflict of Interest:

The authors declare that they have no conflicts of interest related to this study.

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Ethical Approval:

Ethical approval for this study was obtained from the Federal Government Polyclinic Hospital Ethics Committee, Islamabad. Written informed consent was obtained from all participants prior to inclusion.

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Contribution:

Dr. Zahra Kausar - Principal Author - Concept, Drafting, Data Acquisition, Data analysis & Interpretation

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Dr. Natasha Akbar - 4th Author - Critical review for important intellectual content,

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