RESEARCH ARTICLE

Frequency of lower segment caesarean section in patients receiving a Foley's Catheter and Misoprostol for induction of labour

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Abstract

Objective: To determine the frequency of lower-segment caesarean section in patients receiving misoprostol for the induction of labour.

Method: The cross-sectional, observational study was conducted at the Kohi Goth Women's Hospital, Karachi, from June to August 2024 and included women who delivered after receiving misoprostol for labour induction. Data were collected on age, parity, comorbidity, indication, misoprostol dose, mode of delivery, and observations. Data was analysed using SPSS 26.

Results: Of the 200 females with a mean age of 25.92±4.44 years, 104(52%) were multigravida, 190(95.5%) had no existing comorbidities, and 173(86.9%) had postdate pregnancy. Additionally, 163(81.9%) women had a spontaneous vaginal delivery (SVD), and 139(69.8%) had two misoprostol doses. Indication and dose of misoprostol were significantly associated with the mode of delivery ($p<0.05$).

Conclusion: The majority of patients who received misoprostol for labour induction successfully achieved spontaneous vaginal delivery. The indication for induction and the dose of misoprostol administered were significantly associated with the mode of delivery.

Keywords: Frequency, Lower segment caesarean section, Misoprostol, Induction of labour, Pakistan. (JPMA 76: 1238; 2026)

DOI: https://doi.org/10.47391/JPMA.22638

Introduction

The frequency of lower segment caesarean section (LSCS) in patients receiving misoprostol for the induction of labour is a significant topic in obstetric practice, particularly within the Pakistani context. Misoprostol, a synthetic prostaglandin E1 analogue, is widely used for cervical ripening and labour induction due to its effectiveness, ease of administration, and affordability.[1] However, its usage is not without controversy, primarily concerning the risk of CS and other maternal and neonatal outcomes.[2]

Studies have demonstrated that misoprostol is associated with a higher rate of vaginal deliveries compared to other induction methods, such as oxytocin and Foley's catheter.[3] However, the dose and route of administration significantly impact its efficacy and safety profile. Higher doses and certain routes (e.g., sublingual) have been linked to an increased risk of uterine hyper-stimulation, foetal distress, and subsequent CS delivery.[4]

A study comparing sublingual and oral misoprostol found that while sublingual administration resulted in a shorter time to delivery, it was also associated with a higher CS rate, primarily due to abnormal foetal heart rate patterns.[5] In contrast, oral misoprostol was linked to a higher rate of vaginal deliveries, highlighting the importance of careful dose and route selection.[5]

The decision to induce labour with misoprostol must be based on various factors, including the patient's obstetric history, the Bishop score, and the presence of any contraindications, such as a previous CS.[6] The American College of Obstetricians and Gynaecologists (ACOG) recommends caution in using misoprostol in women with a history of CS delivery due to the increased risk of uterine rupture.[7]

The current study was designed to determine the frequency of LSCS among patients receiving misoprostol for labour induction.

Patients and Methods

The cross-sectional observational study was conducted in the Obstetrics and Gynaecology Department at Kohi Goth Women's Hospital (KGWH), Malir University, Karachi, from June to August 2024. After approval from the institutional ethics review board, the sample was raised using a non-probability convenience sampling method. The sample size was calculated using the Roasoft calculator[8] with a 5% margin of error and a 95% confidence interval (CI), assuming a population size of 286, based on the average monthly delivery records of KGWH during the study period.

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Submission complete: 02-12-2024 **1st Revision received:** 27-05-2025

Acceptance: 28-03-2026 **Last Revision received:** 27-03-2026

A conservative response rate of 50% was assumed owing to anticipated incomplete records and patient turnover in a busy hospital setting.

All women who underwent induction of labour, which was initiated with a Foley's catheter and followed by per vaginal insertion of 50mcg misoprostol, were included. Further inclusions were based on postdate pregnancy (gestational age ≥40 weeks + 0 days based on first-trimester ultrasound or reliable last menstrual period), gestational diabetes mellitus (GDM), pregnancy-induced hypertension (PIH), intrauterine growth restriction (IUGR), and decreased foetal movement (FM). Moreover, patients with an intrauterine contraceptive device (IUD) in situ who required induction were also included. Women who had pre-labour rupture of membrane (PROM), any previous scar, any uterine anomaly, and those who had foetal malpresentation (including breech) were excluded. Also excluded were pregnant women with non-reassuring foetal status (abnormal cardiotocography patterns, meconium-stained liquor with abnormal Doppler studies, or severe oligohydramnios).

Data were obtained from hospital electronic medical records and labour ward registers by trained research assistants, including patient number and name, patient age, parity, comorbidity, indication, dose of misoprostol, mode of delivery, and observations.

Data were recorded in an Excel spreadsheet, stratified, and coded. Data was analysed using SPSS 26. Categorical variables were presented as frequencies and percentages, while continuous variables were presented as mean +/- standard deviation. Associations were analysed using cross-tabulation and chi-square test, after assessing the normality of continuous data using the Kolmogorov-Smirnov test. Where expected cell counts were <5, Fisher's exact test was used. P≤0.05 was considered statistically significant.

Results

Of the 200 females with mean age 25.92±4.44 years, 104(52%) were multigravida, 190(95.5%) had no existing comorbidities, and 173(86.9%) had postdate pregnancy. Additionally, 163(81.9%) women had a spontaneous vaginal delivery (SVD), and 139(69.8%) had two misoprostol doses. Overall, 118(59.3%) women delivered a boy (Table 1).

Of the 104 multigravida, the majority of the females were gravida-3-para-2 (g3p2), 28(26.9%), followed by g2p1, 13(12.5%) (Figure).

The indication of induction and dose of misoprostol were significantly associated with the mode of delivery (p=0.007 and p=0.032, respectively) (Table 2).

Table-1: Procedural data of the participants (n=200).

Variables		n (%)
Gravida	Primigravida	96 (48.0)
	Multigravida	104 (52.0)
Comorbidity	None	191 (95.5)
	Pregnancy-Induced Hypertension	5 (2.5)
	Gestational Diabetes Mellitus	4 (2.0)
Indication of Induction	Pregnancy Induced Hypertension	12 (6.0)
	Intra-Uterine Growth Restriction	9 (4.5)
	Gestational Diabetes Mellitus	4 (2.0)
	Post Dates	173 (86.5)
	Decreased Foetal Movement	2 (1.0)
Number of Misoprostol Dose(s)	One	60 (30.0)
	Two	140 (70.0)
Mode of Delivery	Spontaneous Vaginal Delivery	164 (82.0)
	Lower Segment Caesarean Section	36 (18.0)
Outcome	Male	119 (59.5)
	Female	81 (40.5)

Postdates defined as ≥40 weeks of gestation.

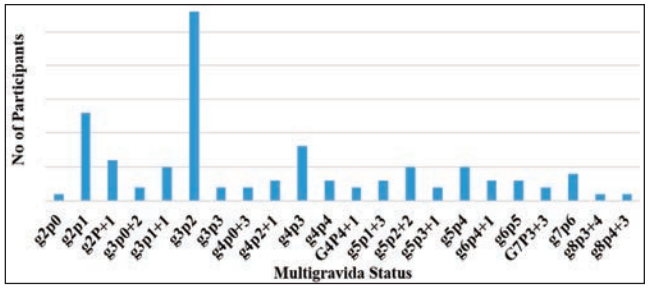

Figure: Multigravida status among the participants (n=104).

Table-2: Association of parity, induction indication, and dosage of misoprostol with the mode of delivery.

Variables	Mode of Delivery			*p*-value
	SVD	LSCS		
Gravida	Primigravida (n=96)	75 (78.1%)	21 (21.9%)	0.118
	Multigravida (n=104)	89 (85.5%)	15 (14.5%)	
Indication of Induction	Pregnancy Induced Hypertension (n=12)	12 (100%)	0	0.007*
	Intra Uterine Growth Restriction (n=9)	6 (66.7%)	3 (33.3%)	
	Gestational Diabetes Mellitus (n=4)	4 (100%)	0	
	Post Dates (≥40 weeks) (n=173)	142 (82.1%)	31 (17.9%)	
	Decreased Foetal Movement (n=2)	0	2 (100%)	
Number of Misoprostol Dose(s)	One (n=60)	44 (73.3%)	16 (26.7%)	0.032*
	Two (n=140)	120 (85.7%)	20 (14.3%)	

*p≤0.05; SVD: Spontaneous vaginal delivery, LSCS: Lower segment caesarean section; Postdates range: 40-42 weeks.

Discussion

In Pakistan, the use of misoprostol for labour induction has gained popularity due to its affordability and availability. However, clinical practices vary widely, and there is a need for standardised guidelines to optimise outcomes. A study

in Peshawar found that misoprostol was effective in inducing labour, but it noted a significant CS rate among the induced patients.[9] Factors contributing to this high CS rate included improper dosing, lack of monitoring, and inadequate facilities for handling complications.

In Pakistan, where maternal and neonatal health indicators often lag behind global averages, understanding the implications of misoprostol use for labour induction is critical. The country's healthcare system faces numerous challenges, including limited resources, variations in clinical practice, and a high prevalence of maternal and neonatal morbidity and mortality. In this context, the decision to use misoprostol for labour induction must balance the benefits of successful vaginal delivery against the potential risks, including the increased CS likelihood.[10]

Addressing these challenges requires standardised guidelines, improved training for healthcare providers, and adequate resources for monitoring and managing labour induction.[11]

In the current study, induction was predominantly performed for postdate pregnancy, consistent with international guidelines.[6,7] Multigravida status, while common in the current sample, was not an indication for induction, and the decision to induce was based on standard obstetric criteria. However, a notable finding was the relatively low incidence of PIH (6%) and IUGR (4.5%) as indications for induction, suggesting a largely healthy cohort.

The current study found a significant association between misoprostol dose and mode of delivery. Two doses of misoprostol were associated with a higher likelihood of SVD compared to one dose. Similar studies in Pakistan have reported comparable findings.[12,13]

The high rate of SVD (82%) compared to LSCS (18%) in the current study reflects the successful use of misoprostol in inducing labour without necessitating surgical intervention in the majority of cases. The significant association between mode of delivery and indication for induction underscores the importance of individualised care in obstetric management.

The current findings align with studies conducted in other regions, such as the United States of America and Europe, where misoprostol is commonly used for labour induction.[14,15] A study in Egypt also reported similar success rates for SVD following oral misoprostol induction.[16] However, the rates of comorbidities, such as GDM and hypertension (HTN), tend to be higher in international studies, possibly due to differences in population health and healthcare practices.[14-16]

Internationally, lower doses are preferred in some settings, and induction is more commonly performed in cases with underlying medical conditions,[17-19] which contrasts with the current study, in which postdate pregnancies were the primary indication. Additionally, the LSCS rate tends to be higher in international studies,[14,17-19] reflecting different clinical thresholds for surgical intervention. International settings may have lower thresholds for CS due to medico-legal concerns, continuous foetal monitoring, and patient preferences, whereas in the current setting, trial of labour is often prolonged in the absence of foetal compromise.

The current study reaffirms the effectiveness of misoprostol in inducing labour with favourable outcomes in a Pakistani sample, consistent with both local and international findings.[12-17,20,21] The high rate of SVD and the significant association between indications for induction and delivery outcomes underscore the importance of tailored obstetric care. However, the differences in comorbidity prevalence and LSCS rates compared to international studies[14,15,17,20,21] suggest that local practices and population characteristics play a critical role in obstetric outcomes. Future studies could further explore these differences to optimise labour induction protocols in diverse settings.

The current study has limitations as it has a relatively small sample from a single institution, which limits the generalisability of the findings. As a single-centre study, the findings may reflect practices, protocols, and patient demographics unique to the institution. The study focussed on immediate delivery outcomes and did not include long-term follow-up to assess maternal and neonatal outcomes, such as postpartum complications, breastfeeding success, or neonatal development. Although the study included comorbidities, the small number of patients with GDM, PIH, and other conditions limited the ability to analyse the impact of these comorbidities on labour induction outcomes. A more diverse sample with higher rates of comorbidities could have provided deeper insights into how these factors influence delivery outcomes. Moreover, the study did not include a control group of patients who underwent labour induction with methods other than misoprostol. Without a comparison with other induction methods, it is difficult to conclude whether misoprostol is superior or inferior to other techniques in terms of safety and efficacy. Addressing these limitations in future research could enhance the understanding of labour induction practices and improve maternal and neonatal care.

Conclusion

The majority of patients receiving misoprostol for labour induction achieved SVD, with LSCS occurring less frequently. Also, the indication for induction and the dose

of misoprostol administered were significantly associated with the mode of delivery.

Acknowledgment: We are grateful to Ms. Ujala and Ms. Amaila for their technical support.

Disclaimer: None.

Conflict of Interest: None.

Source of Funding: None.

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Author Contribution:

AAM: Drafting, revision, data acquisition, analysis, interpretation and agreement to be accountable for all aspects of the work.

SZ: Concept, design and agreement to be accountable for all aspects of the work.

BM: Final approval and agreement to be accountable for all aspects of the work.