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DEMOGRAPHIC AND CLINICAL PREDICTORS OF INDUCTION-ABORTION INTERVAL IN SECOND-TRIMESTER MEDICAL ABORTION WITH MISOPROSTOL: A RANDOMIZED CONTROLLED TRIAL ANALYSIS

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Abstract

Objective: To identify demographic and clinical factors influencing the induction-abortion interval (IAI) among women undergoing second-trimester medical abortion with vaginal misoprostol.

Methods: This prospective randomized controlled trial enrolled 60 women (18–40 years, 13–24 weeks gestation, singleton pregnancy) who received mifepristone 200 mg orally followed by vaginal misoprostol administered as either a loading-dose regimen (Group A, n=30) or a non-loading regimen (Group B, n=30). Baseline demographic and clinical variables including age, body mass index (BMI), gravidity, parity, gestational age, abortion indication, and prior obstetric history were recorded. The primary outcome was the induction-abortion interval (hours from first misoprostol dose to complete abortion). Univariate and multivariate analyses assessed predictors of IAI.

Results: Median IAI was significantly shorter in the loading-dose group compared to the non-loading group (7.88 hours [IQR 7.02–9.03] vs. 13.21 hours [IQR 11.64–15.74], $p<0.001$).

On univariate analysis, greater gestational age and primigravida status were associated with longer IAI, while parity, age, BMI, indication, and prior abortions were not significant predictors.

Multivariate regression revealed that only the use of a vaginal misoprostol loading-dose regimen ($\beta = -4.7$ hours, $p<0.001$) and lower gestational age ($\beta = +0.14$ hours per day increase, $p=0.03$) independently predicted a shorter IAI.

No significant influence of age, BMI, abortion indication, or previous obstetric history on IAI was observed.

Conclusion: Use of a vaginal misoprostol loading dose and earlier gestational age are independent predictors of shorter induction-abortion interval in second-trimester medical abortion, aiding optimized clinical counseling and management.

Introduction

Second-trimester medical abortion (MTA) outcomes vary widely due to demographic and clinical variables. The induction-abortion interval (IAI) — the time from initiation of uterotonic agent to completion of abortion — is an important measure impacting patient comfort and healthcare resource allocation.

While vaginal misoprostol combined with mifepristone is the standard regimen, factors influencing IAI such as parity, gestational age, and regimen protocol (loading vs non-loading dose) require elucidation.

This study analyzes prospectively collected RCT data to identify these predictors, enhancing clinical decision-making.

Methods

Sixty women aged 18–40 years with singleton pregnancies between 13 and 24 weeks gestation were randomized into two groups after oral mifepristone 200 mg pre-treatment:

- **Group A (Loading dose):** Vaginal misoprostol 800 µg loading dose followed by 400 µg every 3 hours (max 5 doses).
- **Group B (Non-loading dose):** Vaginal misoprostol 400 µg every 3 hours (max 5 doses).

Baseline variables recorded: age, BMI, gravidity, parity, gestational age, indication for abortion, and prior obstetric history.

The primary outcome was IAI (hours from first misoprostol dose to complete uterine evacuation).

Statistical analysis included Mann-Whitney U and Kruskal-Wallis tests for univariate comparisons and multivariate linear regression for independent predictors. Statistical significance was set at $p<0.05$.

Results

Table 1. Baseline Demographic and Clinical Characteristics of Study Groups

Characteristic	Group A (n=30)	Group B (n=30)	p-value
Age (years), mean ± SD	27.0 ± 4.5	27.0 ± 4.4	0.750
BMI (kg/m²), mean ± SD	21.0 ± 3.3	20.8 ± 2.8	0.659
Gestational age (days), mean ± SD	131.6 ± 24.2	125.6 ± 80.4	0.100
Primigravida, n (%)	15 (50%)	10 (33.3%)	0.210
Previous abortion, n (%)	9 (30%)	9 (30%)	1.000
Indication mainly congenital malformation (%)	46.7%	40.0%	0.734

No statistically significant differences in baseline variables between groups.

Table 2. Induction-Abortion Interval by Key Predictors

Predictor	Median IAI (hours) [IQR]	p-value	Independent Predictor in Multivariate Analysis
Loading dose regimen (Group A)	7.88 [7.02–9.03]	<0.001	Yes (β: −4.7 hours, p<0.001)
Non-loading regimen (Group B)	13.21 [11.64–15.74]		

Multiparous	10.0 [8.0–13.0]	0.043	No
Primigravida	12.0 [9.0–15.0]		
Gestational age (per day)	Positive correlation (r=0.31)	0.015	Yes (β: +0.14 h/day, p=0.03)
Age	—	0.511	No
BMI	—	0.681	No

Table 3. Multivariate Regression: Predictors of Shorter IAI

Predictor	β (hours)	95% CI	p-value
Loading-dose regimen	-4.7	-6.2, -3.2	<0.001
Gestational age (day)	+0.14	+0.03, +0.25	0.030
Parity	NS		0.11
Age, BMI, indication	NS		NS

The loading dose regimen and lower gestational age had the strongest, independent impact on reducing IAI.

Results Summary

The study included 60 women with comparable demographic and clinical characteristics between the two treatment groups.

The induction-abortion interval was significantly shorter in those receiving a loading dose of vaginal misoprostol compared to non-loading dose. Median IAI for Group A was 7.88 hours (IQR 7.02 to 9.03) versus 13.21 hours (IQR 11.64 to 15.74) for Group B.

Univariate analysis showed that primigravida women and those at higher gestational age had longer IAI, although parity differences were not significant on multivariate analysis. Age, BMI, abortion indication, and prior obstetric history did not significantly affect IAI.

Multivariate regression identified two independent predictors:

- Use of vaginal misoprostol loading dose (associated with mean reduction in IAI by approximately 4.7 hours)
- Lower gestational age at the time of abortion (each additional day of gestation associated with ~0.14 hour longer IAI).

These findings align with previous literature documenting the impact of gestational age and regimen dosing on abortion induction duration.

Discussion

This study confirms that administering a vaginal misoprostol loading dose after mifepristone pre-treatment independently reduces the time to complete abortion in the second trimester.

The increased gestational age leads to longer induction cycles likely due to increased fetal size requiring more cervical dilatation and uterine contractions.

The lack of independent parity effect after adjustment suggests that regimen and gestational age dominate IAI prediction.

Clinicians may use these predictors for individualized counseling, to prepare patients regarding expected abortion duration, and to optimize clinical workflows.

Conclusion

In second-trimester medical abortion with misoprostol, use of a vaginal loading dose regimen and lower gestational age independently predict shorter induction-abortion intervals. These findings

provide evidence base for selecting and counseling patients on misoprostol regimens in clinical practice.

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