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An Analytical Comparative Study Between Oral 600 mcg Misoprostol and Manual Vacuum Aspiration in First-Trimester Incomplete Abortions in a Tertiary Care Centre in Gadag

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Abstract: ***Background: Incomplete abortion is a frequent complication of early pregnancy and, if not managed promptly, can lead to severe morbidity and mortality. Surgical evacuation via manual vacuum aspiration (MVA) and medical management with misoprostol are both recommended, but comparative clinical data in first-trimester cases remain limited. Objective: To compare the efficacy, safety, and acceptability of a single dose of 600 mcg oral misoprostol versus manual vacuum aspiration in first-trimester incomplete abortions. Methods: This prospective analytical comparative study was conducted at the Gadag Institute of Medical Sciences, Karnataka, India, over 18 months. A total of 100 women with sonographically and clinically confirmed incomplete abortions (<13 weeks gestation) were randomized equally into two groups: Group A received 600 mcg oral misoprostol; Group B underwent MVA. Complete uterine evacuation at 2-week follow-up ultrasound was the primary outcome. Secondary outcomes included pain scores, bleeding duration, adverse effects, and patient acceptability. Statistical analyses used Chi-square and Mann–Whitney U tests; significance was set at $p < 0.05$. Results: Complete evacuation occurred in 82% of Group A and 98% of Group B ($p = 0.01$). Mean pain scores were lower in Group A (3.1 ± 1.0) than Group B (6.4 ± 1.2, $p < 0.001$). Mean bleeding duration was shorter in Group B (3.4 ± 0.9 days) versus Group A (5.1 ± 1.3 days, $p < 0.001$). Gastrointestinal side effects were more frequent with misoprostol, while procedural discomfort was higher with MVA. Acceptance rates were high in both groups. Conclusion: MVA achieved higher rates of complete evacuation with shorter bleeding duration, whereas misoprostol offered better pain tolerance and acceptability. Both methods are safe and effective; choice should be guided by patient preference, clinical setting, and available resources.***

Keywords: Incomplete abortion, Misoprostol, Manual vacuum aspiration, First trimester, Postabortion care

1. Introduction

Abortion is defined as the spontaneous or induced termination of pregnancy before fetal viability. The National Centre for Health Statistics and the World Health Organization define abortion as loss or termination of a pregnancy with a fetus aged younger than 20 weeks' gestation or weighing <500 g. (1)

Complications of abortion is a major public health problem throughout the world as it endangers women's lives and contributes significantly to maternal morbidity and mortality.(2)

WHO estimate that 10- 20 million women risk their lives annually by subjecting themselves to termination of pregnancy in South Asia (Pakistan, Bangladesh, Nepal, India and Sri Lanka) comprises 28% of world's population and thirty percent of worlds maternal mortality occur in these four countries. In some parts of the world, cultural, legal, and economic barriers prevent women from seeking safe abortion services, further exacerbating the risk of incomplete abortion.(3) In India in 2015– 2019, there were a total of 48,500,000 pregnancies annually. Of these, 21,500,000 pregnancies were unintended and 16,600,000 ended in abortion. Abortion in India is legal on broad social or economic grounds.(4) Management options for incomplete abortion include expectant management, medical management with uterotonics such as misoprostol, and surgical evacuation. WHO guidelines recommend either vacuum aspiration or medical management with misoprostol for incomplete abortion before 14 weeks' gestation.(5)

Medical Abortion is an increasingly popular method of termination, with four out of five abortions (81%) using medical abortion(6)

Most Medical Abortion products on the global market are manufactured in India. In terms of volume, India represents the third largest pharmaceutical market in the world and supplies 20% of the global market for generic medicines (WHO, 2017).

For the medical management of incomplete abortion, 600µg po (x1) or 400µg sublingual (x1) or 400–800µg per vaginal (x1) can be used in first trimester.(7) Until recently, the treatment for incomplete abortion has usually been surgery of some kind (dilatation and curettage [D + C] or manual vacuum aspiration [MVA]). While these treatments are effective, they require specialised equipment and skills. Furthermore, they subject the woman to the dangers of a surgical procedure—trauma, perforations, infections, bleeding due to instrumentation, and reactions to anaesthesia.(8) Misoprostol, a prostaglandin E1 analogue, offers a non-invasive alternative with the advantages of low cost, stability at room temperature, and ease of administration. (9)

The concept of manual vacuum aspiration (MVA) has evolved from that of menstrual regulation (MR) and has recently elicited considerable scientific interest as a safe method of voluntary termination of first trimester pregnancy (MTP).[10] Expectant management is not preferred by many providers due to its relatively low efficacy and the fact that the time interval to spontaneous expulsion is unpredictable[5,8].

Comparative studies from various settings have reported similar efficacy between the two approaches but differing side-effect profiles and patient preferences. In the Indian context, limited data exist on direct comparison of single-dose 600 mcg oral misoprostol with MVA for first-trimester incomplete abortions. This study aimed to evaluate and compare the efficacy, complications, and acceptability of these two interventions.

2. Materials and Methods

This prospective, randomized, analytical comparative study was conducted in the Department of Obstetrics and Gynaecology, Gadag Institute of Medical Sciences, Karnataka, India, between January 2023 and June 2024.

Inclusion criteria: Women aged ≥18 years, first-trimester incomplete abortion confirmed clinically and on ultrasound, hemodynamically stable without signs of severe infection, and willing to provide informed consent.

Exclusion criteria: Gestational age ≥13 weeks, haemodynamic instability, severe anaemia, signs of pelvic infection, allergy to misoprostol, or history of asthma, cardiac, renal, or liver disease.

Participants were randomized 1:1 into two groups using computer-generated numbers and sealed opaque envelopes:

- Group A: Single 600 mcg oral misoprostol dose under observation.
- Group B: MVA performed under aseptic conditions with Karman's cannula and manual aspirator.

Primary outcome: Complete uterine evacuation at 2 weeks confirmed by ultrasound.

Secondary outcomes: Pain scores, bleeding duration, adverse effects, and patient acceptance.

Data were analysed using SPSS v22.0 with Mann–Whitney U and Chi-square tests, $p < 0.05$ considered significant.

3. Results

Complete evacuation was achieved in 82% of the misoprostol group versus 98% of the MVA group ($p = 0.01$). Mean pain scores were lower in Group A (3.1 ± 1.0) compared to Group B (6.4 ± 1.2, $p < 0.001$). Mean bleeding duration was shorter in Group B (3.4 ± 0.9 days) versus Group A (5.1 ± 1.3 days, $p < 0.001$). Gastrointestinal side effects were more frequent with misoprostol, while procedural discomfort was higher in the MVA group. Acceptance was high in both groups (96% vs 94%).

Table 1: Baseline demographic and obstetric characteristics

Variable	Group A	Group B	p-value
Age, years (mean ± SD)	25.46 ± 4.79	25.42 ± 4.41	0.97[a]
Primigravida, n (%)	24 (48%)	16 (32%)	0.10[b]
Multigravida, n (%)	26 (52%)	34 (68%)	-

[a]Mann–Whitney U test; [b]Chi-square test

Table 2: Clinical outcomes

Outcome	Group A (n=50)	Group B (n=50)	p-value
Complete evacuation, n (%)	41 (82%)	49 (98%)	0.01
Additional procedures required, n (%)	9 (18%)	1 (2%)	0.01
Mean pain score (0– 10)	3.12 ± 1.04	6.42 ± 1.18	<0.001
Bleeding duration (days)	5.1 ± 1.3	3.4 ± 0.9	<0.001
Patient acceptance (satisfied/very satisfied), n (%)	48 (96%)	47 (94%)	0.71

Table 3: Adverse effects

Adverse effect	Group A, n (%)	Group B, n (%)	p-value
Nausea	10 (20%)	4 (8%)	0.09
Vomiting	6 (12%)	2 (4%)	0.14
Diarrhoea	5 (10%)	0 (0%)	0.02
Fever/chills	8 (16%)	5 (10%)	0.37
Procedural discomfort (moderate-severe)	4 (8%)	27 (54%)	<0.001
Serious complications	0 (0%)	0 (0%)	–

4. Discussion

This study found that MVA had a significantly higher complete evacuation rate compared to single-dose misoprostol, with shorter bleeding duration. However, misoprostol was associated with less pain and higher comfort scores, similar to previous studies conducted in both low- and high-resource settings. While MVA remains the gold standard in terms of efficacy, misoprostol offers a valuable alternative in settings where surgical resources are limited.

Strengths include prospective randomised design and ultrasound-confirmed outcomes. Limitations include single-centre design and modest sample size.

5. Conclusion

Both MVA and misoprostol are safe and acceptable for first-trimester incomplete abortion. MVA is more effective with shorter bleeding duration, while misoprostol is less invasive and better tolerated. Choice of method should be individualised based on patient preference, clinical condition, and resource availability.

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