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MISOPROSTOL VERSUS MANUAL VACUUM ASPIRATION FOR REATMENT OF FIRST-TRIMESTER MISSED MISCARRIAGE

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Abstract

Objectives

The objective of this study was to compare the effectiveness, safety, and acceptability of misoprostol and manual vacuum aspiration (MVA) in the management of first-trimester missed miscarriage

Methodology

This comparative observational study included 120 women diagnosed with first-trimester missed miscarriage, allocated into two groups: misoprostol (n=60) and MVA (n=60). Data on demographic characteristics, efficacy, bleeding, pain, need for repeat intervention, hospital stay, and time to resume normal activities were recorded. Qualitative variables, including satisfaction, acceptability, and emotional responses, were assessed through structured interviews. Statistical analysis was performed using t-tests, chi-square tests, and thematic content analysis for qualitative data.

Results

Baseline characteristics were similar between groups. MVA demonstrated significantly superior outcomes, including a higher success rate of complete evacuation (96.7% vs. 81.7%), shorter evacuation time, and reduced need for repeat intervention (3.3% vs. 18.3%). Misoprostol was associated with slightly greater blood loss and longer hospital stay, whereas pain scores were higher in the MVA group. Qualitatively, 90% of MVA participants reported they would choose the method again compared to 68% in the misoprostol group. Women undergoing MVA expressed greater satisfaction and emotional relief, while misoprostol users frequently reported anxiety due to prolonged bleeding.

Conclusion

MVA proved more effective, quicker, and more acceptable than misoprostol, although both methods were safe. Misoprostol remains a valuable option in settings with limited resources, but MVA offers superior clinical and patient-reported outcomes.

INTRODUCTION

Missed abortion is a relatively common event, occurring in up to 10-20% of recognized pregnancies. Missed abortion is in utero death of the embryo or fetus before the 20th week of gestation with retained products of conception. Missed abortions also may be referred to as blighted ovum,

an embryonic pregnancy, or fetal demise [1]. A medical abortion is one that is brought about by taking medications that will end a pregnancy [2]. Vaginal misoprostol is a safe, effective and acceptable method of inducing abortion with a reported effectiveness of 88–94% [3]. About 8.5% of all maternal deaths between January 1999 and December 2008 were estimated to be due to abortion complications in a study done in a tertiary health institution in Abakaliki [4]. However, in remote areas of Nigeria, the shortage of skilled healthcare providers and equipment often limits women's access to treatment with MVA [5]. In a meta-analysis, surgical treatment was significantly more effective (97%) than medical treatment (84%) when the main outcome was complete abortion but it is not known which approach is more cost-effective [6]. Early pregnancy failure is among world's most widely experienced medical conditions. Nearly 20% of clinically recognised pregnancy ends up in miscarriage [7].

The reason of such a high induced abortion rate is multifactorial. Apart from illiteracy, unwanted pregnancies, lack of availability accessibility to contraception and public does not know the change in legal status of abortion. Since 1997, it is recommended by Supreme Court of Pakistan that it is women right to obtain an abortion by her own choice within the first 120 days of pregnancy. It is the legal right of every woman to have safe pregnancy, safe delivery and safe miscarriage. Safe miscarriage can be life saving for women and if performed in unsafe environment leads to maternal injuries and deaths. All these deaths and injuries show social injustice because these all are preventable compare to other main causes of maternal deaths. It became a safe procedure when performed under aseptic measures by qualified health care provider [8]. Miscarriage in first pregnancy trimester is a highly contributing factor of pregnancy related morbidity and mortality [9]. WHO has reported 87000 maternal deaths occur in developing countries every year due to incomplete abortion in first trimester [10]. While MVA is still a standard management option, while high safety and success rate. And WHO recommends MVA should be used as a preferred method of first trimester abortion [11].

METHODOLOGY

This study was conducted in CMH Quetta, on 120 patients. All procedures and data collection were performed after obtaining institutional ethical approval, and informed written consent was obtained from each participant. The study population consisted of women diagnosed with first-trimester missed miscarriage, defined as a nonviable intrauterine pregnancy of ≤12 weeks' gestation confirmed through transvaginal ultrasound.

Participants were allocated into two groups based on the treatment modality chosen after standardized counseling: the misoprostol group and the MVA group. The misoprostol regimen consisted of a standardized dose administered through the appropriate route according to clinical protocol. Women assigned to the MVA group underwent uterine evacuation using a sterile manual vacuum aspirator under local or general anesthesia, as clinically indicated. All procedures were conducted by trained obstetric care providers in accordance with established clinical guidelines.

Quantitative data were collected using structured data collection forms. Variables included age, gravidity, parity, gestational age, and baseline hemoglobin level. Treatment-related quantitative variables included time to complete uterine evacuation (in hours), estimated blood loss (in milliliters), success rate of complete evacuation, requirement for repeat intervention, and incidence of complications such as infection, excessive hemorrhage, or uterine perforation. Pain intensity was measured using a 10-point visual analog scale (VAS) immediately after treatment and during follow-up. Additional quantitative measures included duration of hospital stay and number of days required to resume normal daily activities. Qualitative variables were incorporated to assess subjective experiences and emotional aspects of treatment. These included patient satisfaction, overall acceptability, emotional responses, and perceived comfort during the procedure. Satisfaction was categorized as very satisfied, satisfied, neutral, dissatisfied, or very dissatisfied. Acceptability was explored through open-ended questions assessing treatment preference, willingness to choose the same method in future, and perceived advantages or drawbacks. Providers documented additional

qualitative observations related to ease of performing the procedure, patient cooperation, and any signs of psychological distress.

Data were collected at three stages: baseline (pre-intervention), during the treatment process, and follow-up at one and two weeks post-intervention. Transvaginal ultrasound at follow-up confirmed complete uterine evacuation. Adverse events and complications were recorded systematically. Qualitative interviews were conducted in a private setting to ensure confidentiality and to encourage open, honest responses. All collected data were validated through a double-entry system to minimize transcription errors. Quantitative data were analyzed using descriptive and inferential statistical methods. Means and standard deviations were calculated for continuous variables, while frequencies and percentages were used for categorical variables. Comparative analyses between the misoprostol and MVA groups were conducted using independent t-tests or Mann–Whitney U tests for continuous variables and chi-square tests for categorical variables. Qualitative data were analyzed using thematic content analysis to identify recurring themes related to patient experience and treatment acceptability.

RESULTS

A total of 120 women diagnosed with first-trimester missed miscarriage were included in the study, with 60 participants in the misoprostol group and 60 in the MVA group. Baseline demographic and obstetric characteristics such as age, gravidity, parity, gestational age, and baseline hemoglobin were comparable between the two groups, with no statistically significant differences. The results demonstrated significant differences in treatment outcomes between the misoprostol and MVA groups. The mean time to complete uterine evacuation was substantially longer in the misoprostol group compared to the MVA group. The success rate of complete evacuation was higher in the MVA group (96.7%) than in the misoprostol group (81.7%). The misoprostol group exhibited a greater need for repeat intervention, with 18.3% requiring additional treatment versus only 3.3% in the MVA group.

Estimated blood loss was slightly higher in the misoprostol group, while the mean pain score reported immediately after treatment was significantly higher in the MVA group. However, participants undergoing misoprostol generally required a longer hospital stay and took more days to resume normal activities.

Table 1. Quantitative Comparison of Treatment Outcomes between Groups

Variable	Misoprostol (n = 60)	MVA (n = 60)	p-value
Mean Age (years)	27.8 ± 5.1	28.1 ± 4.8	0.72
Mean Gestational Age (weeks)	9.1 ± 1.4	9.0 ± 1.6	0.64
Baseline Hemoglobin (g/dL)	11.6 ± 1.2	11.8 ± 1.3	0.41
Time to Complete Evacuation (hours)	22.4 ± 8.6	1.9 ± 0.7	<0.001*
Estimated Blood Loss (mL)	118 ± 34	103 ± 28	Estimated Blood Loss (mL)
Success Rate (%)	81.7%	96.7%	Success Rate (%)
Need for Repeat Intervention (%)	18.3%	3.3%	0.01*
Pain Score (VAS 0–10)	4.8 ± 1.7	6.2 ± 1.9	<0.001*
Hospital Stay (hours)	28.6 ± 10.4	8.3 ± 3.6	<0.001*
Days to Resume Normal Activities	3.8 ± 1.2	2.1 ± 0.9	<0.001*

*Significant at $p < 0.05$

Qualitative assessments revealed notable differences in patient experience and acceptability. Despite reporting higher procedural pain, the majority of women in the MVA group expressed higher satisfaction due to the rapid completion of treatment and perceived efficiency. In contrast, women in the misoprostol group frequently described anxiety related to prolonged bleeding and uncertainty about completion. In terms of acceptability, 90% of MVA participants stated they would choose the same method again, compared to 68% in the misoprostol group. Emotional responses differed as well: women in the MVA group described a sense of relief and closure, while some misoprostol participants reported stress from waiting for tissue passage. Provider notes indicated that the MVA procedure was generally easier to perform and required less follow-up, whereas misoprostol management required more patient counseling and emotional reassurance.

Table 2. Qualitative Findings on Satisfaction and Acceptability

Qualitative Variable	Misoprostol (n = 60)	MVA (n = 60)
Overall Satisfaction		
Very Satisfied	18 (30%)	42 (70%)
Satisfied	20 (33.3%)	12 (20%)
Neutral	10 (16.7%)	3 (5%)
Dissatisfied	8 (13.3%)	2 (3.3%)
Very Dissatisfied	4 (6.7%)	1 (1.7%)
Acceptability (Would Choose Again)	41 (68%)	54 (90%)
Perceived Comfort	Moderate	High
Common Emotional Responses	Anxiety, prolonged waiting, uncertainty	Relief, closure, minimal stress
Provider Observations	Requires more counseling; prolonged monitoring	Quick procedure; easier cooperation

Overall, MVA was more effective and better accepted by participants, with higher success rates, quicker completion, and greater satisfaction. Misoprostol, while less invasive, resulted in longer evacuation times, increased need for repeat intervention, and more emotional discomfort due to the prolonged process. Both methods remained safe, with low complication rates in each group.

DISCUSSION

A total of 120 women diagnosed with first-trimester missed miscarriage were included in the study, with 60 participants in the misoprostol group and 60 in the MVA group. Baseline demographic and obstetric variables such as age, gravidity, parity, gestational age, and baseline hemoglobin levels were comparable between the two groups, and no statistically significant differences were observed. The findings demonstrated clear differences in treatment outcomes between the misoprostol and MVA groups. A previous study conducted in 2017 reported similar findings, concluding that MVA was a superior treatment modality compared with medical management using intravaginal misoprostol. The efficacy rate was significantly higher in the MVA group, particularly among older women, where MVA achieved a notably higher success rate than medical treatment [12].In the present study, the mean time required to achieve complete uterine evacuation was substantially longer in the misoprostol group compared with the MVA group. The success rate of complete evacuation was also higher with MVA (96.7%) than with misoprostol (81.7%). Furthermore, a greater proportion of women in the misoprostol group required repeat intervention (18.3%) compared with the MVA group (3.3%). Another study published in 2020 similarly reported that although medical treatment was associated with

a higher failure rate, the overall effectiveness of the two treatment modalities did not differ significantly. However, medical management demonstrated higher levels of client acceptance and satisfaction and was found to be more cost-effective than surgical treatment [13].

In the current research, estimated blood loss was slightly higher among women receiving misoprostol, whereas the average pain score immediately following treatment was significantly higher in the MVA group. Nevertheless, women treated with misoprostol generally required a longer hospital stay and took more time to return to normal daily activities. Evidence from a 2024 study further supports the greater effectiveness of MVA for achieving complete uterine evacuation. However, that study also noted that misoprostol was safer, produced fewer side effects, and was more acceptable to patients, making it a preferable choice for the management of early pregnancy loss in resource-limited settings [14]. Qualitative findings from the present study revealed notable differences in patient experience and acceptability. Despite reporting higher procedural pain, most women in the MVA group expressed greater satisfaction due to the rapid and efficient nature of the procedure. In contrast, many women in the misoprostol group described increased anxiety related to prolonged bleeding and uncertainty about when completion would occur. In line with these observations, another study from 2024 found the efficacy of misoprostol for first-trimester pregnancy termination to be 95.20%, slightly higher than the 90.50% reported for MVA [15].

In the current research, acceptability was also higher in the MVA group, with 90% of women indicating they would choose the same method again, compared with 68% in the misoprostol group. Emotional responses varied: women undergoing MVA frequently described relief and a sense of closure, while misoprostol users often reported stress associated with waiting for tissue expulsion. Provider feedback also indicated that MVA was generally easier to perform and required less follow-up, whereas misoprostol management demanded more extensive counseling and emotional support. A 2020 study likewise reported that although medical management had a higher failure rate, effectiveness between the two methods did not differ significantly. However, medical treatment continued to demonstrate greater patient acceptance and satisfaction, and it remained more cost-effective than surgical evacuation [16]. Overall, the present study found that MVA was more effective and more readily accepted by participants, offering higher success rates, faster completion of treatment, and greater overall satisfaction. Misoprostol, although less invasive, was associated with longer evacuation times, a higher need for repeat intervention, and greater emotional discomfort due to prolonged uncertainty. Nonetheless, both methods were found to be safe, with low complication rates reported in each group. Comparable findings were reported in a 2014 study, which concluded that both MVA and misoprostol are effective options for uterine evacuation in incomplete abortion of less than 12 weeks. However, MVA was noted to be significantly safer in terms of side effects [17].

CONCLUSION

The study demonstrated that manual vacuum aspiration (MVA) was significantly more effective than misoprostol in achieving complete uterine evacuation, with faster treatment completion and higher patient satisfaction. Misoprostol, although less invasive, resulted in longer evacuation times and a greater need for repeat intervention, contributing to increased emotional stress for some patients. Despite these differences, both methods were found to be safe, with low complication rates. Overall, MVA appears to be the superior treatment option, while misoprostol remains a valuable alternative, particularly in resource-limited settings.

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