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Effectiveness of Misoprostol Versus Manual Vacuum Aspiration for the Treatment of the First Trimester Pregnancy Termination

Bushra Khan[1], Amna Aziz[2], Shahida Parveen[3], Hina Zahra Qureshi[4], Humaira Imran[5], Maria Khan[6]

[1]Associate Professor Obs & Gynae Bakhtawar Amin Hospital Multan
[2]Assistant Professor Nishtar Medical University, Multan,
[3]Associate Professor Bahawal Victoria Hospital, Bahawalpur,[4]Senior Registrar Obs & Gynae Bakhtawar Amin Hospital Multan, [5,6]Assistant Professor Bakhtawar Amin Hospital, Multan

Author`s Contribution

[1,3]Substantial contributions to the conception or design of the work or the acquisition, methodology, analysis, Final approval of the version to be published. [2,4,5]Active Participation in active, [6]Drafting the work or revising it critically for important intellectual content

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Address of Correspondent
Dr. Bushra Khan
Associate Professor Obs & Gynae Bakhtawar Amin Hospital Multan
bushrakhan@yahoo.com

ABSTRACT

Objective: To compare the effectiveness of misoprostol versus manual vacuum aspiration (MVA) in the treatment of pregnancy termination at first 12 weeks of pregnancy, evaluating the outcomes among women undergoing these procedures.

Methodology: A comparative analysis was carried out at the Obstetrics and Gynaecology department of Bakhtawar Amin Hospital, Multan from January 2023 to December 2023, included pregnant women presented with age of gestation age up to 12 weeks, open cervical os and indication for elective termination of pregnancy. Participants were randomized into two groups. Misoprostol group received 400 mcg of misoprostol intravaginally every 4 hours for up to three doses for softening cervix, its dilatation, and uterine contractions, with starting oxytocin infusion after 6 hours. While manual vacuum aspiration group underwent the procedure under general anesthesia without receiving any uterotonics. Patients were followed up on the 7th day post-procedure, undergoing ultrasonography to measure endometrial thickness for efficacy assessment based on complete abortion.

Results: A total of 126 patients were comparatively studied; 63 in each group with mean age in the Misoprostol group was 33.45±3.11 years, and was slightly lower the MVA group as30.22±4.76 years. The average gestational age at the time of treatment was almost similar between the groups, 8.33 ±1.29 weeks for Misoprostol group and 7.99±2.56 weeks for the MVA group. The Misoprostol group exhibited an efficacy rate of 95.20% among patients, compared to 90.50% in the MVA group (P=0.148). Furthermore, the efficacy between Misoprostol and MVA across different age groups, gestational ages, and parity, was statistically insignificant (p->0.05).

Conclusion: Basis on the study findings, the efficacy of misoprostol for first trimester termination of pregnancy was observed to be 95.20%, slightly higher than the 90.50% with manual vacuum aspiration (MVA).

Keywords: Pregnancy, termination, effectiveness, MVA, Misoprostol.

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Introduction

Miscarriage is a frequent occurrence in pregnancy, affecting roughly 30% of all pregnancies.[1] Early fetal demise, also known as a missed miscarriage, typically presents with light vaginal bleeding, abdominal pain, and a decrease in pregnancy symptoms, while the cervix remains closed.[1] Abortion-related complications are a significant global public health issue, posing serious risks to women's lives and significantly contributing to maternal morbidity and mortality.[2] A substantial number of pregnant women seem to seek emergency care for induced

abortion at health facilities.[3,4] A common trait among these women is the intent to terminate an unwanted pregnancy in the early weeks of gestation. Additionally, it is often reported that many of these visits occur after intrauterine death of the fetus or failure possibility due to various causes.[3,5]

Various methods are used worldwide to treat miscarriage, including expectant, medical, and surgical management. Expectant management involves giving the body time to naturally expel the pregnancy tissue without any intervention.[6] Throughout several decades, surgical therapy, which included dilatation and curettage (D&C), was the usual strategy.[7] Although, D&C carries risks of complications, including perforation of uterus, infection of the pelvis, heavy bleeding, anesthesia-related issues, injury of the cervix, intrauterine adhesions, or insufficiency of the cervix in subsequent pregnancies, and it is also associated with high costs.[7,8] In countries where abortion is restricted, allowed only under specific conditions, or entirely prohibited, some individuals may resort to dangerous and potentially deadly methods. Therefore, ensuring the availability of safe and legal abortion services is essential to protect the health and well-being of those seeking abortions.[6,9]

A number of medications have been employed to perform medical abortions, including misoprostol, mifepristone, and methotrexate. Particularly mifepristone and the Misoprostol are the most commonly used. Vaginal misoprostol is the effective, acceptable and the safe method for abortion induction, with the described effectiveness of 88% to 94%.[10,11] It has proven to be both cost-effective and efficient for treating early pregnancy loss. On the other hand, reported that the MVA is the effective and safe method for treating incomplete miscarriage, while it is not widely accessible or affordable in rural areas, especially in low-resource countries.[12]

Manual vacuum aspiration (MVA) performed under local anesthesia as an office procedure is becoming a popular treatment for miscarriage in the under developing nations. Its success rate is comparable to that of traditional surgical methods. According to the literature, both management options are proven to be effective. However, there are still controversies regarding their respective advantages and disadvantages. Like MVA, accessibility in the countries with low-resources is limited by the lack of sterile equipment and skilled health care provider. Additionally, it requires trained personnel, an operating room, an anesthetist, and sometimes a blood transfusion. Even though careful and skilled intervention, complications such as hemorrhage, inadequate evacuation, infection and perforation can still occur even in the best hands.[13,14]

Conversely, the use of misoprostol for incomplete abortions could reduce the demand on healthcare facilities and experienced healthcare professionals. Additionally, it decreases the need for medical devices, surgical materials, and anesthesia, lowering expenses for medical facilities globally. Recent studies have suggested that MVA provides a more successful treatment than dilatation and evacuation during the initial phases of pregnancy miscarriages, having the added benefit of safety.[2,13,15]

Given these controversies and the lack of strong conclusive local evidence, this study has been conducted to compare the efficacy of misoprostol and manual vacuum aspiration for the treatment of first trimester pregnancy termination.

Methodology

A comparative study, was done at Department of Obstetrics & Gynaecology, at Bakhtawar Amin Hospital, Multan after permission from ethical committee and research department. This study was conducted during a period of one year from January 2023 to December 2023. All pregnant women aged 18-40 years within the first 12 weeks of gestation, diagnosed with incomplete, missed, or inevitable miscarriage, and with open cervical os, who provided written informed consent, were included. Women with a scarred uterus, multiple pregnancies, diagnosis of ectopic or molar pregnancy, known allergies or adverse reactions to misoprostol or any study medication components, comorbidities such as severe anaemia, bleeding disorders, cardiovascular diseases, and asthma, as well as those unwilling to attend scheduled follow-up visits or comply with study procedures, were excluded. Non-probability consecutive sampling technique was used. All of the cases had obtained informed permission by fully informing potential research participants about the goals, methods, risks, advantages, and alternatives of the study so they could decide for themselves whether or not to participate. All the cases were equally divided as 63 sample size for misoprostol group while 63 sample size for MVA group. Randomization was done 1:1 for misoprostol group and MVA group.

The Misoprostol group was treated with intravaginal administration of 400 mcg misoprostol tablets every 4 hours, up to three doses, to facilitate cervical softening, dilatation, and contractions of uterus. Oxytocin infusion

commenced 6 hours after the first dose at an initial rate of 2 mIU/min, increasing by 1 mIU/min every 30 minutes, up to a rate of 8 mIU/min. While the MVA group did not receive any uterotonics and underwent the procedure directly under general anaesthesia. MVA was performed using an IPAS double valve syringe and a plastic cannula sized between number 5 and 8, as appropriate for the procedure. Procedures were completed by skilled consultants having minimum experience of 5 years or more. Patients in both groups were observed in the hospital following therapy. Before being discharged, they were given appropriate antibiotics as per Hospital protocols. Individuals without significant bleeding were discharged home 12 hours following manual vacuum aspiration in the MVA group, or after confirming full uterus emptying with transvaginal ultrasound in the misoprostol group. On the seventh day of the procedure, the patients were asked to come back for a follow-up. A transvaginal ultrasound evaluation was performed to determine the thickness of the endometrium at the maximal anteroposterior diameter on the long-axis view of the uterus. Effectiveness was obtained in the form of complete abortion. Data was collected using a custom prepared proforma. Data were examined using (SPSS 26 version).

Results

The mean age in the Misoprostol group was 33.45±3.11 years, and was slightly lower the MVA group as30.22±4.76 years. The average gestational age at the time of treatment was almost similar between the groups, 8.33 ±1.29 weeks for Misoprostol group and 7.99±2.56 weeks for the MVA group. Average parity was 2.13±1.44 in the Misoprostol group and 2.10±1.32 in the MVA group. Furthermore, the socioeconomic status distribution shown in table I.

Table I: Basic statistical information of the patients. (n=126)

Variables		Study groups: Misoprostol group	Study groups: MVA group
Mean age		33.45±3.11 years	30.22±4.76 years
Gestational age		8.33 ±1.29 weeks	7.99±2.56 weeks
Parity		2.13±1.44	2.10±1.32
Socioeconomic status	Poor	20(31.7%)	30(47.6%)
	Middle	28(44.4%)	22(34.9%)
	Upper	15(23.8%)	11(17.5%)
	Total	63(100.0%)	63(1000.0%)

The Misoprostol group exhibited an efficacy rate of 95.20% among patients, compared to 90.50% in the Manual Vacuum Aspiration (MVA) group (P=0.299), as illustrated in Figure 1.

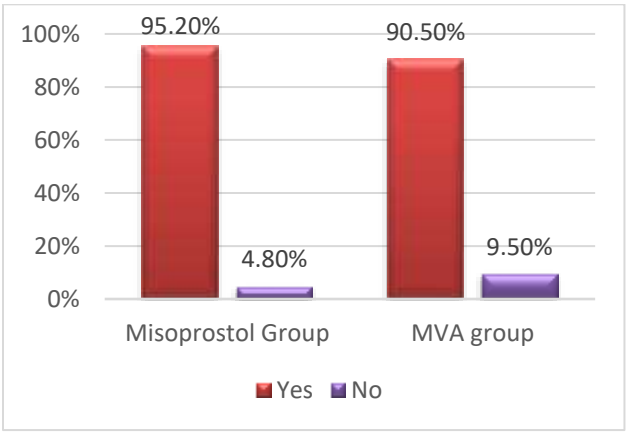

Figure 1. Comparison of efficacy in both groups. (n=126)

According to the comparison of efficacy between Misoprostol and MVA across different age groups, gestational ages, and parity, with insignificant p-values indicating the statistical insignificance of the differences (p->0.05). Table II

Table II: Comparison of efficacy in both groups according to age, gestational age and parity (n=126)

Variables		Efficacy	Study groups: Misoprostol	Study groups: MVA	Total	p-value
Age groups	**18-30 years**	Yes	27	29	56	0.725
		No	2	3	5	
	31-40 years	Yes	33	28	61	0.259
		No	1	3	4	
Gestational age	**≤8 weeks**	Yes	29	18	47	0.344
		No	3	4	7	
	9-12 weeks	Yes	13	39	52	0.417
		No	0	2	2	
Parity	**1-2**	Yes	22	7	29	0.430
		No	2	0	2	
	>2	Yes	38	50	88	0.135
		No	1	6	7	

Discussion

Termination of pregnancy in the first trimester refers to the medical or surgical procedures used to end a pregnancy within the first 12 weeks of gestation. This period is often considered the safest and most effective time for performing an abortion. This study evaluated the effectiveness and safety of misoprostol versus MVA for the termination of pregnancy in the first trimester, with a comprehensive sample size of 126 patients, with mean age of 33.45±3.11 years in misoprostol group, slightly higher

than the MVA group as 30.22±4.76 years. average gestational age at the time of treatment was almost similar between the groups, 8.33 ±1.29 weeks for Misoprostol group and 7.99±2.56 weeks for the MVA group. In aligns to this study Kubra K et al[13] a total of 184 patients enrolled in their study, with an average of 28.4 ± 6.5 years in MVA group and, whereas 28.1 ± 6.2 years in misoprostol group, along with an average gestational age 8.5 ± 3.1 weeks in MVA group, while 8.2 ± 3.4 weeks in group of misoprostol.

In this study The Misoprostol group exhibited an efficacy rate of 95.20% among patients, compared to 90.50% in the MVA group (P=0.299)**.** Furthermore, the efficacy with respect to age of women, age of gestation and parity in misoprostol group and manual vacuum aspiration group, found to be statistically insignificant (p=>0.05). In aligns to this series Ani VC et al[14] reported that the occurrence of successful complete abortion 86.3% in the group of misoprostol, while 100.0% for the control group of MVA. Tasnim N et al[16] reported an MVA efficacy rate of 89.6% in a study conducted in Pakistan. Ghora documented a success rate of 85-90% with misoprostol, concluding that endocervical administration of misoprostol is effective, well tolerated, and has decreased side effects. Study by Mohamed SA et al[17] found no significant difference in overall success rates and average patient satisfaction scores between the two groups under study. According to statistical analysis, the satisfaction rates at the one-week mark were 82.9% for the misoprostol group and 94.3% for the MVA group.[17] Our findings were also supported by the Ibiyemi KF et al[18] found no significant difference in satisfaction between the misoprostol and MVA treatment groups, with satisfaction rates of 92.7% and 89.8%, respectively (P = 0.473).

Consistently Zaman N et al[19] reported that the MVA and misoprostol are both effective for managing incomplete miscarriage in the first trimester. However, according them MVA seems to offer a higher safety profile in contrast to misoprostol.[19] Furthermore according to Using the medicinal approach, patient satisfaction stood at 95.65%, while in the MVA group, it was 84.78%. Success rates were recorded at 95.65% for the medicinal approach and 97.82% for the MVA group. For low-resource settings, this study suggests that misoprostol offers several advantages over manual vacuum aspiration (MVA). Firstly, misoprostol is a more flexible treatment option. Unlike MVA, which needs a clear diagnosis involving both abortion status and the stage of pregnancy, misoprostol can be delivered with less diagnostic requirements. Furthermore, the study shows that both treatments can be safely administered to women without the need for ultrasound examinations, which are expensive and require expert operators. Additionally, misoprostol is easy to utilize. Comparing to MVA, which requires specific equipment and a qualified operator, misoprostol can be delivered with less resources and training. The study had a few disadvantages, such as many patients being lost to follow-up, possibly creating bias and restricting the interpretation of long-term consequences. Research investigation was conducted in a single site, that could restrict the results' applicability to other settings with diverse patient populations and healthcare practices. Larger-scale studies involving multiple places or people may produce more accurate results. This would increase the generalizability of findings across various environments and populations of patients

Conclusion

Study revealed that the both MVA and 400 µg intravaginal misoprostol are effective management options for the early pregnancy termination. Choice between the methods can be guided by the availability of each option and the preferences of the individual. A surgical procedure (MVA), requires specific equipment and trained personnel but provides immediate results. Although misoprostol, a medical approach, offers flexibility and can be administered with less stringent diagnostic requirements, making it particularly suitable for low-resource settings. Ultimately, presenting both options allows women to make informed decisions based on their circumstances and personal preferences, ensuring that they receive the most appropriate care for their requirements.

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