

## A Comparative Study of Manual Vacuum Aspiration with Medical Method of Management for Incomplete and Missed Abortion

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### Abstract

**Background:** Early pregnancy failure has been a major health problem throughout the world. An estimated 15% of all pregnancies end in spontaneous miscarriage, apart from 46 million manually induced abortions. Of these, at least 20 millions are expected to be unsafe, with an approximate 67000 deaths occurring annually due to illegal abortions performed under unsafe conditions. India is no exception and the death following to these unsafe and illegal abortions is on the rise at an alarming rate. This could also be attributed to the limited availability of medically safe and legal abortion procedures, especially in rural India. Thus, there is a requirement for a safe, inexpensive, feasible and widely accepted modes of abortion techniques to prevent maternal deaths associated with unsafe abortion techniques. Aims and Objectives- EFFICACY- Complete evacuation of products of conception from the uterine cavity, SAFETY- Amount of bleeding per vaginum during hospital stay, ACCEPTABILITY- Duration of hospital stay.

**Material and Methods:** A comparative interventional study was designed and conducted at the Department of Obstetrics and Gynaecology in Government Maternity Hospital, Sultan Bazar, Koti, Hyderabad affiliated to Osmania Medical College, Hyderabad which is a tertiary care teaching hospital over a period of 1 year i.e., from February 2021 to January 2022 on 160 clinically diagnosed incomplete and missed abortion patients with gestational age less than or equal to 12 weeks, who were classified into 2 groups based upon the kind of interventions they opted; as Group-A, who opted for medical intervention with Tab. Misoprostol. and Group-B, who opted for Manual Vacuum Aspiration (MVA).

**Results:** The mean age of Group A was 23.7 years while that of Group B was 26.5 years. Most of the subjects enrolled (124 of 160) were multigravida which increases the efficacy of abortion as compared to primigravida. Additionally, many of the subjects were multipara (108) which in turn has better efficacy as compared to the primipara individuals.

**Conclusion:** The obtained results have led to the conclusion that the MVA group has higher safety index when compared to medical intervention with misoprostol regimen by the means of reduced bleeding. Also, a higher satisfaction and feasibility levels were observed with MVA since there were minimal Against Medical Advice (AMA) or absconded subjects. These observations suggest that MVA could be a promising method of abortion with higher efficacy, acceptability and safety as compared to medical management.

**Keywords:** Abortion, Manual Vacuum Aspiration, Misoprostol, Missed abortion and Incomplete abortion.

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## Introduction

Pregnancy failure in the first trimester is one of the common health issues encountered by women across the world. In fact, an estimated 15% of all pregnancies tend to end up in spontaneous miscarriages. Apart from this, 46 million induced abortions are estimated annually of which a staggering 20 million are expected to be unsafe, that in turn are cause of at least 67000 deaths every year which accounts to 13% of all maternal deaths. Quite many of these deaths can be attributed to septicaemia and haemorrhage, while few women may suffer from long term morbidities of these unsafe procedures that include pelvic infection, uterine perforation and anaemia.

These unsafe abortions are prevalent in India as well and with the rise in overall number of abortions, there is an increase in deaths due to these unsafe and illegal procedures. Even with a low mortality rate of 1 in 100,00 from legal abortion and legalization of voluntary termination of pregnancy, there are certain factors that hinder the utilization of safe and legal abortion procedures, especially in the rural areas. One of the main factors is the availability of these services, which has been resulting in 15000-20000 deaths per annum related to abortions. This has been a serious concern and a requirement of a procedure to fill this unmet need at the earliest, that would be inexpensive, safe, effective and acceptable, is of high priority.

Abortion procedure could be performed by medical management by the administration of misoprostol regimen. Misoprostol is a synthetic prostaglandin E1 analogue which is usually taken in by oral route. However, has a high number of contraindications such as anaemia, ectopic pregnancy, cardiovascular disorders, etc. Also, side effects include bleeding, cramping, fever, chills, etc some of which could last for a period of 2 weeks.<sup>[1]</sup>

On the other hand, surgical management is another variable option. Surgical options include sharp curettage and MVA. Sharp curettage is no longer an acceptable option owing to the higher complication rates. However, MVA and Electrical pump aspiration (EVA) are good options for surgical management with respect to early termination of pregnancy.<sup>[2-4]</sup> Also, MVA has increased portability that eases the difficulty with availability.

## Aims and Objectives

A clinical study with the intention of identifying a procedure that could cater the needs of current population was designed with two arms that had different interventions to compare the various features. This study included women with clinically diagnosed first trimester incomplete and missed abortion. The objectives of the study were as follows:

- **EFFICACY**- Complete evacuation of products of conception from the uterine cavity
- **SAFETY**- Amount of bleeding per vaginum during hospital stay
- **ACCEPTABILITY**- Duration of hospital stay

## Material and Methods

This prospective interventional study included women admitted in Obstetrics and Gynaecology department with clinically diagnosed incomplete and missed abortion in Government Maternity Hospital, Sultan Bazar, Koti, Hyderabad affiliated to Osmania Medical College, Hyderabad, which is a tertiary care teaching hospital over a period of 1 year i.e., from February 2021 to January 2022. The enrolled subjects were provided with the option of medical or surgical management. The medical management included the administration of misoprostol regimen, while the surgical intervention included MVA. Over the study period, 160 subjects were enrolled of which 80 underwent MVA and the remaining 80 opted for medical management.

The subjects that underwent MVA were operated under paracervical block, IV sedation and short GA, while the regimen used for the subjects who opted for medical management included Tablet misoprostol 800mcg per vaginal stat and Tablet misoprostol 400mcg sublingual 6th hourly 3 doses as per the requirement.

All the subjects underwent either transabdominal sonography (TAS) or transvaginal sonography (TVS) to observe the evacuation of product of conception. Also, the amount of bleeding was assessed by direct and visual methods. Additionally, the duration of hospital stay and the number of subjects that went AWA/ absconded were also noted.

### Inclusion criteria

1. All women admitted in obstetrics and gynaecology department Government Maternity Hospital, Sultan Bazar, Koti, Hyderabad affiliated to Osmania Medical College, Hyderabad, after clinical diagnosis of spontaneous incomplete and missed abortion.
2. Women within 12 completed weeks of gestation.
3. Women who have given informed consent.

### Exclusion Criteria

1. Patients with induced abortion medically as well as surgically.
2. Women with gestational age more than 12 weeks.
3. Molar pregnancy.
4. Uterine anomalies
5. Pelvic infection
6. Bleeding disorders.

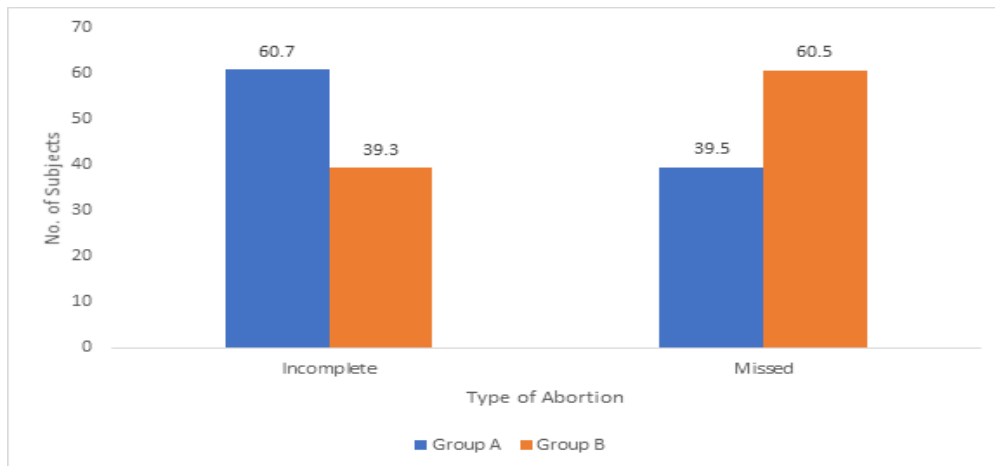
### Results

The enrolled subjects were divided into arms namely Group A and B based on the type of management that was opted. Group A underwent medical intervention and had a mean age of 23.7 with a gestational age of 73.6 days and the mean Blood pressure (BP) being 110.3/68.3. On the other hand, Group B who opted for MVA had a mean age and gestational age of 26.5 years and 66.5 days respectively, with a mean BP of 111.6/70.8. Also, the hemoglobin (Hb) levels of Group A and Group B were 9.71 and 9.66 respectively.

**Table 1: Mean Obstetrics Index**

Variables	Group A(n=80)		Group B (n=80)		p-value
	Median	IQR	Median	IQR	
Gravida	2	1,3	3	2,3	<.001
Para	1	0,2	2	1,2	<.001
Live	1	0,1	1	1,2	<.001
Abortion	0	0,0	0	0,0	.99
IQR denotes interquartile range; Mann Whitney u-test used; p-value <0.05 is significant					

Additionally, the obstetrics index of all the subjects was assessed, as in Table.1 for which the median was G2P1L1A0 for Group A and G3P2L1A0 for Group B.



**Figure 1: Diagnoses across Group A and B**

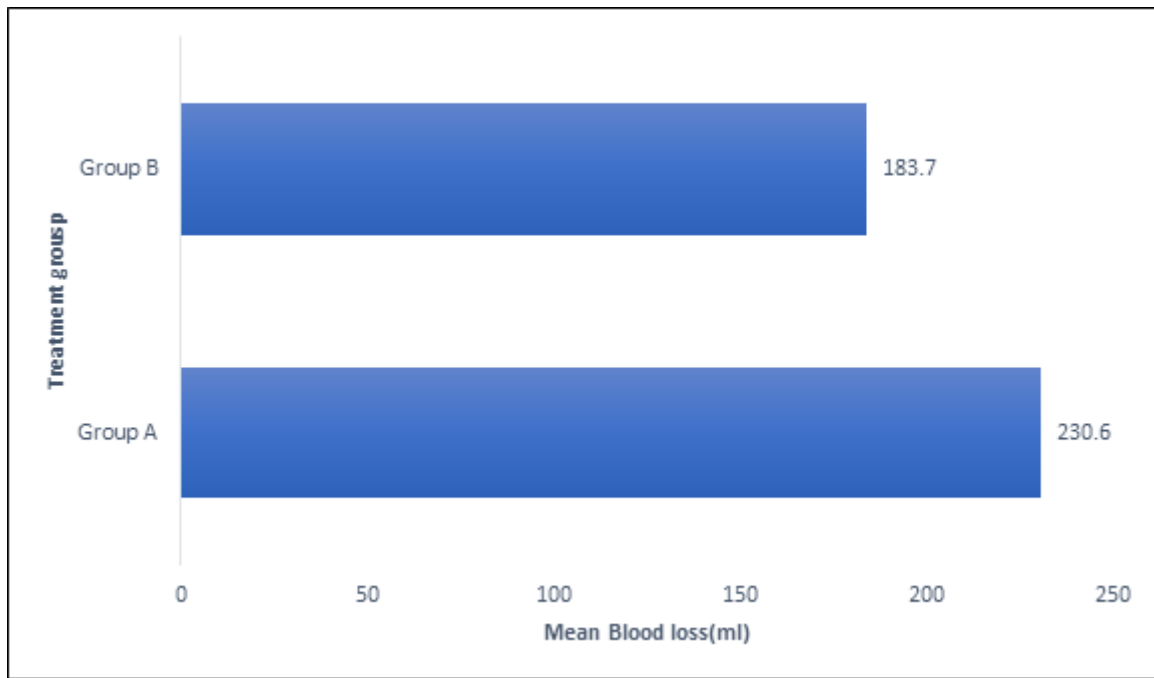
With respect to the diagnosis, there were incomplete and missed abortions as in [Figure 1].

**Table 2: ?**

Variables	Efficacy				$\chi^2$	p-value
	RPOC Absent		RPOC Present			
	No	%	No	%		
Group A [n=80] (Misoprostol)	54	67.5	26	32.5	12.1	.001
Group B [n=80] (MVA)	72	90.0	8	10.0		
Pearson's chi-square test used; p- alue <0.05 is significant						

The efficacy of the treatments as mentioned above was determined in terms of the evacuation of the product of conception and a better result was observed with MVA as in [Table 2].

A sub analysis of the same based on age groups wherein the subjects were divided into 3 groups of; 20 years and less, age group 21-30 years and age groups 31-40 years presented that there was no significant difference in the efficacy in terms of the age difference. On the contrary, it was observed that lower gestational age had lower efficacy in Group A. Also, an increased gestational age did not have any better results in Group A when compared to Group B.



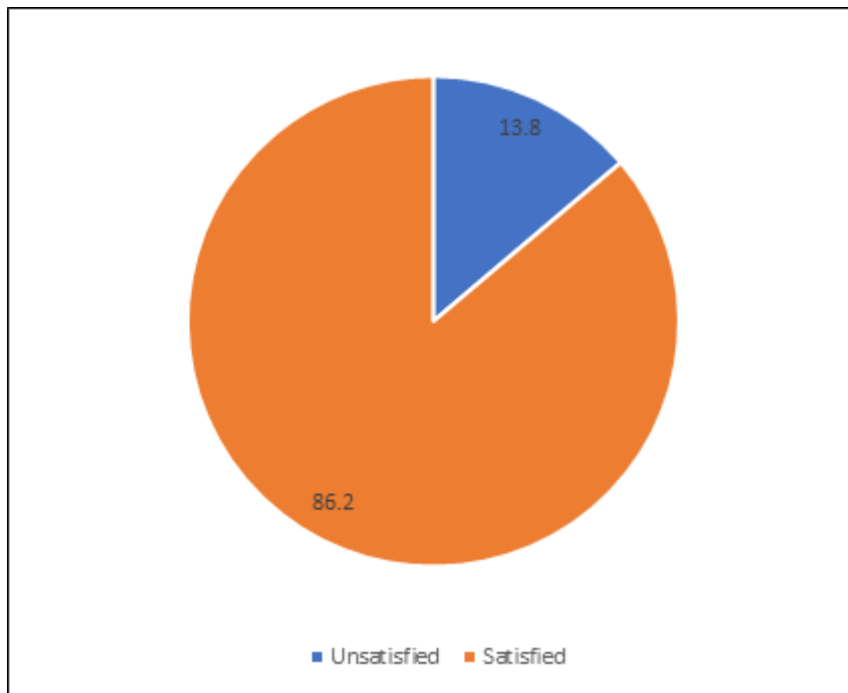
**Figure 2: Mean Blood Loss Across Treatment Groups**

The safety parameter, which was assessed with by utilizing the loss of blood in terms of volume also had a positive trend towards the subjects treated with MVA as in [Figure 2].

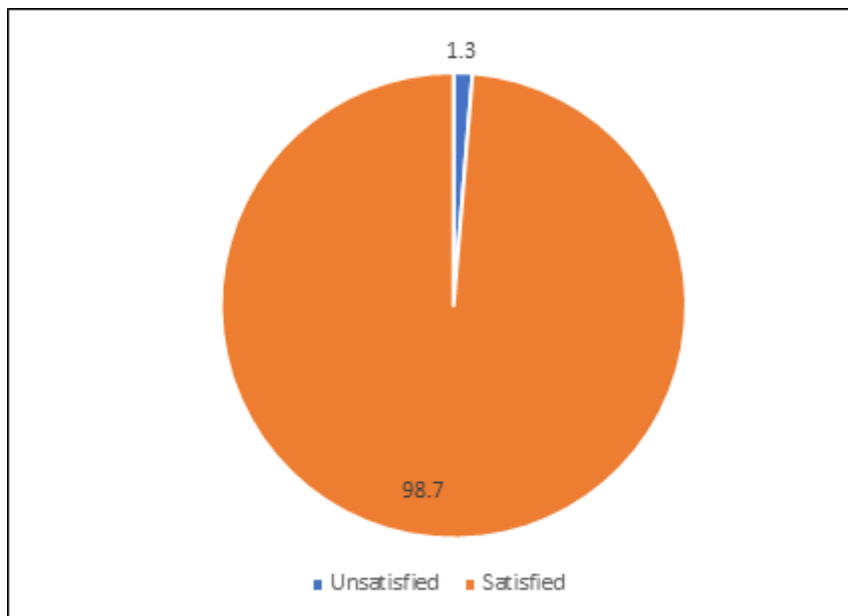
**Table 3: ?**

	Group A (n=80)		Group B (n=80)		t-value	p-value
	Mean [Median]	SD [IQR]	Mean [Median]	SD [IQR]		
Duration of Hospital stay (in days)	3.56 [3]	1.1 [3,4]	3.23 [3]	0.6 [3,3]	2.4	.015
Independent t-test used; p-value <0.05 is significant						

On comparing the duration of stay in the hospital, it was observed that Group B subjects had a lower hospital stay in comparison to Group A as in [Table3].



**Fig.3: Group A Subject Satisfaction (in %)**



**Fig.4: Group B Subject Satisfaction (in %)**

A similar trend was observed with respect to the number of subjects who have left AWA/absconded as shown in [Figure 3 & 4].

### Discussion

Prioritizing the options for management of early pregnancy losses, high prevalence of miscarriage and related complications has substantial health and economic cost is of utmost importance. MVA is an alternative to the previous standard surgical curettage, performed under local anesthesia and can be performed without the need for a fully equipped operation theatre, as it does not need electricity and can be carried out under para-cervical block.

In countries with a limited number of physicians, MVA can be safely and effectively used by mid-level health care providers such as midwives. World health organization (WHO)

recommends manual vacuum aspiration as the preferred method for the first trimester abortion.

In present study, efficacy was noted in 67.5% patients and 90% patients respectively in group A & B. However, efficacy rate in group B was significantly ( $P = 0.001$ ) higher as compared to group A.

Hemlin J et al,<sup>[4]</sup> have shown that complete evacuation was achieved in 95.3% with manual vacuum aspiration.

Bique et al have compared the efficacy of MVA with that of the misoprostol for treatment of incomplete abortion.<sup>[5]</sup> The results of the study favor manual vacuum aspiration as the preferred method for uterine evacuation during first trimester of pregnancy.

Tasnim N et al have shown that complete evacuation was achieved in 89.6% with manual vacuum aspiration.<sup>[6]</sup>

Edwards S et al also reported success rate with manual vacuum aspiration as 98%.<sup>[7]</sup>

Ansari R et al found success rate with manual vacuum aspiration as 97.7%.<sup>[8]</sup>

In one study by Shuaib AA et al 52 women were allocated to receive intravaginal misoprostol, 80.7% achieved a successful complete expulsion of the products of conception.<sup>[9]</sup>

Shankar M et al also concluded that 77.3% women achieved successful complete medical evacuation by receiving misoprostol.<sup>[10]</sup>

Shah N et al also found 48% success rate with intravaginal misoprostol for the complete evacuation of first trimester missed abortion.<sup>[11]</sup>

All these studies agree with our findings. The success rates of medical evacuation vary from 25% up to 97% for oral, sublingual or vaginal misoprostol in different studies. These variations between studies probably reflect the different misoprostol regimens used, routes of administration, and the definitions of success rate.<sup>[12]</sup>

## Conclusion

Amount of bleeding per vaginum is more in medical method as compared to Manual Vacuum Aspiration (MVA) method which indicates the safety. Also, a high satisfaction rate was observed among the MVA group because less patients went AMA or absconded. The effectiveness of medical method of abortion in present study was high in MVA group because of the higher number of complete evacuations of uterine cavity. Patient acceptability was also higher with MVA group than medical group owing to the lesser duration of hospital stay. Results of this study revealed that MVA is better treatment modality as compared to medical management (misoprostol). Hence proved the MVA is more efficacious, safer, acceptable, and satisfactory procedure as compared to medical management.

## Author Contribution:

The First and the corresponding author, Dr. M. Suguna Shobha Rani, contributed in Data collection, design of the article, Data analysis and interpretation.

The Second author, Dr. Sarada Bandaru, was involved in revision and drafting of the manuscript, final approval of version to be published.

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