

## OUTCOME OF MANUAL VACUUM ASPIRATION (MVA) IN MANAGEMENT OF INCOMPLETE ABORTION

JALAL R\*

Department of Obstetrics & Gynaecology, Sandeman Provincial Hospital Quetta, Pakistan

\*Corresponding author's email address: [drrubinajalal@gmail.com](mailto:drrubinajalal@gmail.com)

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**Abstract:** Partial abortions represent a significant worldwide health concern, particularly in regions such as Pakistan. Manual Vacuum Aspiration (MVA) is a potential therapeutic intervention due to its efficacy and safety. This study aims to evaluate the effectiveness and safety of MVA in treating partial abortions, with a focus on outcomes such as procedure success rates, complications, and patient characteristics influencing outcomes. **Objective:** The objective of this study is to assess the efficacy and safety of Manual Vacuum Aspiration (MVA) as a therapy for treating partial abortions, particularly in the context of Sandeman Provincial Hospital, Quetta. Specific objectives include evaluating procedure success rates and post-procedural complications and identifying any correlations between patient characteristics and outcomes. **Methods:** This cross-sectional study was conducted at Sandeman Provincial Hospital, Quetta, from August 1, 2021, to January 31, 2022. A sample size of 67 pregnant women aged 18 to 35, showing clinical signs of incomplete abortion, was selected using non-probability sequential sampling. Data collection encompassed various criteria, including procedure duration, blood loss, blood transfusion requirement, evacuation completeness, and length of hospital stay. Correlation analysis was employed to explore relationships between patient characteristics and outcomes. **Results:** The study found that 82% of patients had a successful MVA procedure. Post-abortion bleeding was observed in 69% of cases, and post-abortion infections in 52%. A strong correlation was identified between gravida and postpartum haemorrhage and infection, indicating higher vulnerability among primigravida individuals. However, no significant correlation was found between gravida and the length of hospital stay, blood transfusion requirement, or MVA efficiency. **Conclusion:** Manual Vacuum Aspiration (MVA) demonstrates effectiveness and safety as a low-cost, decentralised method for treating partial abortions. Results suggest its incorporation into healthcare systems to mitigate abortion-related risks and reduce rates of maternal morbidity and mortality. This study provides valuable insights into the use of MVA in incomplete abortion care, supporting clinical practice and policy decisions aimed at improving global reproductive health outcomes.

**Keywords:** Manual Vacuum Aspiration (MVA), Early Pregnancy Failure, Abortion, Incomplete Abortion

### Introduction

Abortion is a multifaceted issue associated with maternal mortality, severe complications such as bleeding, fever, and infections, as well as psychological distress, including regret, guilt, and engagement in risky behaviours, as reported by Gauthier S (2015) (1). Frederico, Reardon DC (2018) emphasise that abortion's reasons are diverse, encompassing socioeconomic, emotional, and psychological factors, particularly among women directly affected by it (2). However, research findings suggest that the relationship between abortion and its consequences is complex, influenced by socioeconomic and demographic characteristics and the legality of abortion. Factors such as family life quality, the number of children, planned or unplanned pregnancies, attitudes, and genetics contribute to the psychological effects of abortion (3).

Abortion, a practice with a long history worldwide, remains a topic of debate regarding its legitimacy and repercussions (4). In Iran, abortion is considered religiously illegal, resulting in a lack of credible prevalence data. Nevertheless, a study in Tehran prior to the Islamic revolution revealed that among 16,707 pregnancies in 4,209 women, 1.5% ended in stillbirths and 11% in abortions (5). Despite religious and cultural beliefs, an anthropological study conducted in downtown Tehran found that abortion was a prevalent activity among women (6, 7). Research on abortion's physiological repercussions in Iran has been infrequent, especially in recent decades.

Al-Daweel RMA, Al-Kaaky NS (2023) propose Manual Vacuum Aspiration (MVA) as an alternative to dilatation and curettage (D&C) in managing early pregnancy failure (8). MVA offers advantages such as avoiding general anaesthesia in favour of analgesics or paracervical blocks, lower complication rates, shorter hospital stays, reduced costs, and fewer resource requirements. Despite its simplicity, affordability, and user-friendliness, MVA's adoption among physicians has been limited. However, the department in question has successfully utilised MVA for several years, finding it effective, safe, cost-efficient, and straightforward to administer. Notably, MVA significantly outperforms D&C in terms of procedure duration, hospital stay, and cost (9).

MVA, with its superior safety profile, is presented as a promising alternative to sharp curette uterine evacuation. Its appeal is heightened by the fact that midwives and nurses can be rapidly trained, which is particularly beneficial in resource-constrained countries like Pakistan, where many patients lack access to healthcare experts. Encouraging healthcare practitioners to employ MVA more frequently in treating early pregnancy failure is crucial to preventing maternal mortality and morbidity (10). The study's scope is to assess the outcomes of Manual Vacuum Aspiration (MVA) in managing incomplete abortion. Given the safety and effectiveness of MVA with minimal complications, the study aims to evaluate the disease burden and timely management of incomplete abortion. The study assessed

post-MVA outcomes, including bleeding, infection, and the need for blood transfusion, hospital stay duration, and the procedure's effectiveness in completely evacuating fetal or placental materials, as confirmed by abdominal ultrasound. The study is expected to contribute to an integrated approach that emphasises early assessment and appropriate management, ultimately improving outcomes and reducing complications in patients with incomplete abortions.

**Methodology**

The study employed a cross-sectional design and was conducted in the Department of Obstetrics & Gynecology at Sandeman Provincial Hospital in Quetta over six months, from August 1, 2021, to January 31, 2022. The sample size of 67 was determined using the WHO sample size calculator, with a 95% confidence level, 4% desired precision, and an estimated prevalence of 2.90% based on a previous study. Non-probability consecutive sampling was used to select participants. Inclusion criteria comprised pregnant women aged 18-35 years with clinical features of incomplete abortion at a gestational age before 24 weeks, while exclusion criteria included cases with other types of miscarriage, intrauterine devices, signs of previous pelvic infections, or a history of gynaecological tumours. Data was collected after obtaining informed consent, and participants underwent Manual Vacuum Aspiration (MVA) procedures. Observations were made six hours post-procedure, assessing various factors, including procedure duration, blood loss, need for blood transfusion, completeness of evacuation, and hospital stay duration. Completion of the procedure was confirmed through ultrasound. Follow-up appointments were scheduled for four weeks to confirm abortion status or address complications like post-abortion infection. Data analysis was conducted using SPSS version 26.0, with descriptive statistics and stratification to control for effect modifiers. A significance level of  $\leq 0.05$  was considered statistically significant.

**Results**

In this study, 67 pregnant women with a history of incomplete abortion were examined, with a mean age of  $24.54 \pm 4.70$  years and mean weight and height of  $54.67 \pm 6.47$  kg and  $153.98 \pm 7.23$  cm, respectively (Table). Among the participants (Table 2), 75% were primigravida, while 25% were multigravida. The evaluation of Manual Vacuum Aspiration (MVA) outcomes for incomplete abortion focused on post-abortion bleeding, infection, the need for blood transfusion, length of hospital stay, and the effectiveness of MVA in achieving complete evacuation, detected via ultrasound. Post-abortion bleeding was observed in 69% of the cases (46 out of 67), while post-abortion infection was present in 52% (35 out of 67). The need for blood transfusion was noted in 70% of cases (47 out of 67). Lengthy hospital stays (more than 6 hours) were significant in 34% of cases (23 out of 67). The effectiveness of MVA, in terms of complete removal of fetal or placental materials as confirmed by ultrasound, was reported at 82%. Socioeconomic status was also assessed, revealing that 19% of participants belonged to the upper class, 33% to the middle class, and 48% to the lower class. Regarding the relationship between outcomes and gravida (Table 3), a significant association was found between gravida and post-abortion bleeding ( $p$ -value = 0.044). Primigravida patients were more prone to post-abortion bleeding compared to multigravida patients. Similarly, a solid significant relationship was found between gravida and post-abortion infection, with primigravida women exhibiting a higher incidence. In contrast, there was no significant relationship between gravida and the need for blood transfusion ( $p$ -value > 0.05) or the length of hospital stay ( $p$ -value = 0.278). Additionally, no statistically significant relationship was found between gravida and the effectiveness of MVA in achieving complete evacuation.

**Table 1: Profile of the participants**

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Age	67	17	18	35	24.54	4.701
Weight	67	22	42	64	54.67	6.477
Height	67	26	139	165	153.99	7.235

**Table 2 Descriptive statistics: Characteristics of the participants**

		Frequency	Percentage
Socioeconomic Status	High	13	19.4
	Low	32	47.8
	Middle	22	32.8
Gravida	Multigravida	17	25.4
	Primigravida	50	74.6
Bleeding	No	21	31.3
	Yes	46	68.7
Post-abortion infection	No	32	47.8
	Yes	35	52.2
Need for transfusion	No	20	29.9
	Yes	47	70.1
Length of hospital stay	Insignificant	44	65.7
	Significant	23	34.3
Effectiveness	No	12	17.9
	Yes	55	82.1

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**Table 3: Relationship of the outcome factors with the gravidity**

		Gravida		Total	Chisquare ( $\chi^2$ )	P-Value
		Primigravida	Multigravida			
Post-abort bleeding	Yes	31	15	46	4.058	0.044*
	No	19	2	21		
Post-abort infection	Yes	34	1	35	19.62	0.000*
	No	16	16	32		
Need for blood transfusion	Yes	33	14	47	1.62	0.203
	No	17	3	20		
Length of hospital stay	Yes	19	4	23	1.178	0.278
	No	31	13	44		
Effectiveness	Yes	41	14	55	0.001	0.974
	No	9	3	12		

## Discussion

The transition of medical procedures from conventional operating rooms to ambulatory settings has become a prevailing trend, particularly in tertiary care hospitals facing resource limitations. This shift is evident in the management of early pregnancy loss as well, with Manual Vacuum Aspiration (MVA) emerging as a potential means to substantially reduce the cost associated with inpatient care, given the relatively high prevalence of early pregnancy failure.

MVA has garnered recognition and endorsement from the World Health Organization as a safe and efficacious technique for uterine evacuation, particularly in resource-constrained regions (11). Significantly, studies have indicated that MVA procedures are associated with reduced blood loss and lower complication rates compared to inpatient procedures, as evidenced in the findings of this study.

The study's results demonstrate an impressive 82% effectiveness of MVA in achieving complete evacuation of uterine debris, a result that aligns with prior research findings. It is noteworthy that other investigations have reported even higher efficacy rates, reaching 92.3%. Over two decades, various studies have consistently affirmed the effectiveness of MVA, with reported efficacy ranging from 95% to 100% (12).

While specific clinically significant outcomes, such as post-abort infection and bleeding, displayed a statistically significant relationship in this study, other factors like the length of hospital stay and efficacy did not exhibit significant associations.

MVA has emerged as a favoured method for managing early pregnancy loss and is anticipated to continue gaining prominence. Notably, MVA has been successfully employed as an outpatient technique for induced early abortions within the first 9 to 12 weeks of gestation. A comprehensive literature review underscores MVA's exceptional effectiveness, with a remarkable 98% rate of achieving complete uterine evacuation.

One of the critical advantages of MVA lies in its adaptability to resource-constrained settings, as it operates without electricity or extensive anaesthesia. Additionally, healthcare providers below the level of physicians, including midwives and lady health workers, can safely administer MVA procedures with appropriate training and oversight. This underscores the pivotal role that MVA can

play in enhancing healthcare accessibility and outcomes in such (13-16).

## Conclusion

MVA is a cost-effective and risk-free method for treating incomplete abortions, with an 82% effectiveness rate. It can help decentralise post-abortion care, improve patient satisfaction, and reduce maternal morbidity and mortality in underdeveloped countries.

## Declarations

### Data Availability statement

All data generated or analysed during the study are included in the manuscript.

### Ethics approval and consent to participate.

Approved by the department concerned. (SPHQ-IRB\_2020/44)

### Consent for publication.

Approved

### Funding

Not applicable

## Conflict of interest

The authors declared the absence of a conflict of interest.

## Author Contribution

### ROBINA JALAL (Postgraduate Trainee)

Study Design, Review of Literature. Manuscript drafting. Conception of Study, Development of Research Methodology Design, manuscript review, and final approval of manuscript.,

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