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Original Article

Efficacy of Manual Vacuum Aspiration versus Dilatation and Curettage in First Trimester Miscarriages

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ABSTRACT

Objective: To compare the efficacy of Manual Vacuum Aspiration (MVA) with Dilatation and Curettage (DNC) in miscarriages of the first trimester.

Study Design: Quasi-experimental study.

Place and Duration of Study: Department of Obstetrics and Gynaecology CMH, Peshawar Pakistan, from Feb to Aug 2018.

Methodology: A total number of 182 Adult female (20-35 years of age) patients having miscarriage during the first trimester who were either primigravida or with previous history of spontaneous vaginal delivery were included in this study. Patients were assigned randomly into Manual vacuum aspiration (MVA) and Dilatation and Curettage (DNC) groups using the draw randomization technique. Data regarding the efficacy of both procedures and procedural success rate was measured in all patients.

Results: A total of 182 Adult female patients, with a mean age of 30.53+5.23 years, having miscarriage in the first trimester, were evaluated. The mean gestational age at the time of abortion was 8.64+1.30 weeks, and the mean parity of study females was 1.96±0.82. The procedure was successfully done in 87(95.6%) patients in the MVA Group versus 84(92.3%) in the D&C Group (*p*-value 0.35).

Conclusion: Manual vacuum aspiration (MVA) is an effective and safe method of abortion with a success rate comparable to that of Dilatation and Curettage (D&C).

Keywords: Dilatation and curettage, Manual vacuum aspiration, Miscarriage.

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INTRODUCTION

Maternal health of women is associated with safe pregnancy. However, its safe termination in case of complications is equally important and has future effects on childbearing. An estimated 56 million miscarriages each year are done around the world.[1] Even though there has been progress in medical technology, complications arising from unsafe miscarriage in developing countries lead to 10-13% of maternal deaths.[2] Options for early pregnancy loss include medical treatment, expectant management and surgical evacuation. Surgical techniques include DNC and manual vacuum aspiration. Women usually prefer evacuation surgically over medical and expectant treatment because of less follow-up due to earlier completion of the process.[3,4]

The most commonly used method of dealing with incomplete miscarriage in developing countries is DNC. In this method, uterine evacuations are performed with sharp curettage. According to FIGO and WHO, the sharp curettage method should be replaced with medical treatment with Misoprostol and manual vacuum aspiration.[5,6]. This method is faster, safer, and more comfortable and is associated with shorter hospital stays than sharp curettage.[7,8] A few studies showed controversial results. In the total of 46 trials, (9250**)** women were included and found that medical treatments for first-trimester miscarriage have similar effectiveness and side effects compared to surgery.[9,10] This study aimed to compare the efficacy of MVA with DNC in first-trimester pregnancy losses and validate the significance of MVA over DNC. Secondly, using safer and cheaper techniques in low-income and low-literacy countries has manifold effects.

METHODOLOGY

The quasi-experimental study was carried out at CMH Peshawar from February to August 2018, after approval from the Hospital Ethical Review Committee (No. 56121) and written informed consent. A total of 182 patients (91 patients in each group) calculated by using epi-tools online software for sample size

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calculation for two means (Frequency of success rate of MVA= 98.6%6 and Frequency of success of DNC= 80.5%6, by taking power of the test 80.0% and level of significance 5.0%) were included in the study.

Inclusion Criteria: Female aged 20-35 years, having a miscarriage during the first trimester who were either primigravida or with a previous history of normal vaginal delivery were included.

Exclusion Criteria: Patients with bleeding disorders and hepatic, renal and cardiac diseases were excluded.

Patients were assigned randomly into MVA and DNC groups using the draw randomization technique. Consultant gynaecologists performed these procedures with at least two years of post-fellowship experience.

Statistical Package for Social Sciences (SPSS) version 24.0 was used for the data analysis. Quantitative variables were expressed as Mean±SD and qualitative variables were expressed as frequency and percentages. Chi-square test was applied to explore the inferential statistics. The *p*-value of ≤0.05 was considered statistically significant

RESULTS

A total of 182 patients were included in this study (91 patients in the MVA-Group and 91 patients in the D&C-Group). The mean age of patients was 30.53±5.23 years. The mean BMI of included patients was 24.48±4.42 Kg/m^2, with a minimum BMI of 15.35 Kg/m^2 and a maximum BMI of 34.52Kg/m^2. The mean gestational age at the time of abortion was 8.64±1.30 weeks. The mean parity of study females was 1.96±0.82 (Table-I).

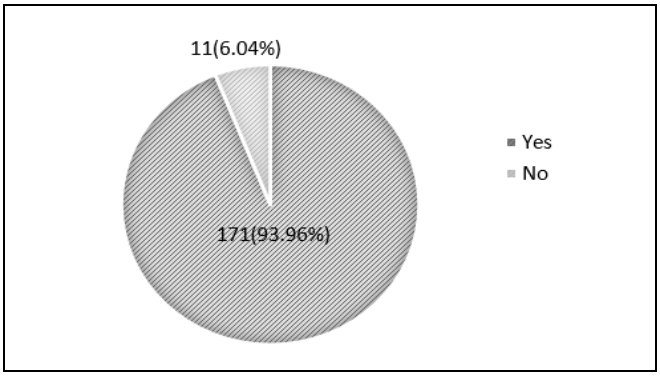

Figure: Frequency of Procedural Success Rate (n=182)

Table-II: Comparison of Procedural Success Rate between Manual Vacuum Aspiration (MVA) and Dilatation & Curettage (D&C) Groups (n=182)

Procedure	Successful n(%)	Unsuccessful n(%)	*p*-value
Manual Vacuum Aspiration (MVA)	87(95.6%)	4 (0.04)	0.001
Dilatation & Curettage (D&C)	84(92.3%)	7 (0.07)	0.001

DISCUSSION

The main advantage of manual vacuum aspiration is that it requires local anaesthesia, which helps in management as an outpatient rather than an inpatient one.[11] MVA is preferable mainly because of its convenience and extreme safety. It is cost-effective and not usually associated with bleeding risk, uterine perforation, pain or infection.[12]

There has been an increase in the use of this method in the developing world. According to the Royal College of Obstetrics and Gynecologists (RCOG)

Table-I: Descriptive Statistics of Height, Weight, Gestational age and Parity (n=182)

Mean±S.D	Age (yrs)	Height (cm)	Weight (Kg)	BMI (Kg/m2)	Gestational Age (wks)	Parity
	30.53±5.23	155.89±9.01	59.45±11.56	24.4±4.42	8.64+1.30	1.96±0.82

The overall procedural success rate in study patients was 171(93.96%). At the same time, the procedure was unsuccessful in 11(6.04%) females (Figure) on comparison of procedural success rate between the groups. Abortion was successful in 87(95.6%) patients in the MVA-Group versus 84(92.3%) in the D&CGroup; the difference was found to be statistically significant (*p*-value 0.001) (Table-II). Association of age was performed to determine the effect of age on hospital stay and procedural success rate in MVA versus D&C groups. There was no significant difference in procedural success rates in MVA versus D&C groups in patients of different ages.

guidelines, It is recommended as an effective and acceptable method in early trimester-induced abortions. Studies also showed MVA as a practical alternative to EVA with higher success rates. Research proved manual vacuum aspiration is cost-effective due to short hospital stays managing incomplete abortions.[13,14] In the present study, we compared the outcomes of MVA with D&C in first-trimester miscarriages.

In the present study, the mean gestational age at the time of miscarriage was 8.65±2.30 weeks, and the range was 6 to 11 weeks. The mean gestational age in the study of Islam *et al*. was 9.4±1.23 weeks. The

maximum number of gestational ages ranged from 9 to 11 weeks.[7] Cohort analysis by Kamel *et al*., the women undergoing MVA were up to 10 weeks gestational age, and Westfall studied MVA up to 10 weeks gestation, which is compatible with the present study.[15]

The overall procedural success rate in the present study was 95.6% in the MVA-Group versus 91.1% in the D&C-Group. The mean hospital stay of study patients was 16.75±2.31 hours in the MVA-Group versus 5.86±1.45 hours in the MVA-Group (*p*-value <0.001). The procedural success rate in the study of Salam *et al*. was 98.6% in the MVA-Group and 88.5% in the D&C-Group.[6]

A prospective study of 125 patients undergoing either MVA (40 patients), medical management of miscarriage (25 patients) or surgical management of miscarriage (60 patients) was carried out over six months. There was found to be no significant statistical difference between comfort scores. This study further supports the existing literature that establishes the safety and efficacy of MVA as a management option for first-trimester miscarriages. It also demonstrates that it compares favourably with medical and surgical management of miscarriages regarding patient comfort and outcome.[16] Another study at Bolan Medical Complex Hospital compared 50 women undergoing MVA with 50 women undergoing D&C in theatre. The mean operative time was 7.63±1.69 min with MVA and 11.47±2.62 min with D&C. No perforation was observed in the Manual Vacuum Aspiration Group, while in the D&C-Group 2(6.7%) patients had uterine perforation. MVA had less procedural time than D&C, along with less blood loss and short hospital stay.[17]

A recent local study compared the safety and efficacy of manual vacuum aspiration (MVA) with dilatation and curettage (DNC) in managing early pregnancy failures. One hundred twenty patients were studied, and the average procedural time was significantly higher, with a short hospital stay found in the DNC-Group compared to the MVA-Group (*p*=0.001). The mean Visual analogue score for pain assessment was significantly higher in patients of the DNC-Group at 6.23±2.12 compared to the MVA-Group at 3.22±2.13.[18]

A case series to observe the efficacy and safety of manual vacuum aspiration in cardiac patients, done at the Armed Forces Institute of Cardiology, National Institute of Heart Disease, Rawalpindi, showed that complete evacuation was achieved in 100% of patients. There were no major cardiac or gynaecological complications except arrhythmia in 1(2.9%) patient. Therefore, MVA is an effective and safe intervention compared to other modalities of managing miscarriages, even in high-risk cardiac patients.[19] Tahir *et al*. found pain score significantly lower in the MVA-Groups (1.75±0.87) than in the Misoprostol-Group (I.99±1.32). In the Manual vacuum-Group, efficacy was found in 269(97.1%) patients, whereas in the Misoprostol-Group, efficacy was found in 260(93.9%) patients.[20]

LIMITATIONS OF STUDY

Despite its safety and success record, MVA is still not used widely as an alternative management for uterine evacuation in early abortions in Pakistan. In countries like Pakistan, where health care resources are already limited, MVA could be considered routinely, hence avoiding the need for access to operation theatre and general anaesthesia.

CONCLUSION

Manual vacuum aspiration (MVA) is a safe and effective method in first-trimester miscarriages. Judicious use of MVA helps in safe early abortion, accessible to rural and urban societies, especially where high-tech equipment and power supply are unavailable.

Authors Contribution

Following authors have made substantial contributions to the manuscript as under:

HS: Study design, drafting the manuscript, data interpretation, critical review, approval of the final version to be published.

SMA: Critical review, data acquisition, drafting the manuscript, approval of the final version to be published.

SK: Data acquisition, data analysis, data interpretation, critical review, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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