ORIGINAL ARTICLE

MANUAL VACUUM ASPIRATOR (MVA)- A SAFE AND EFFECTIVE ALTERNATIVE TO CONVENTIONAL CURETTAGE IN THE SURGICAL MANAGEMENT OF 1ST TRIMESTER MISCARRIAGES

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ABSTRACT

Objective: To compare the efficacy of manual vacuum aspiration and conventional evacuation & curettage (ENC) for first-trimester miscarriage management.

Materials and Methods: This quasi-experimental study was carried out at the Department of Gynecology and Obstetrics, Khyber Teaching Hospital, Peshawar, Pakistan from October 2022 to March 2023 including 150 patients with first trimester miscarriage dividing them into two groups (MVA and ENC) having equal number of patients. Efficacy in both groups was compared.

Results: The mean age in the MVA group (group A) was 27.81±6.31years while in the ENC group (group B) it was 26.50±6.27 years. The mean gestational age in group A was 5.82±2.82 weeks while in group B it was 5.95±2.9 weeks. MVA was effective in 88% of participants while ENC was effective in 93.33% of participants (p-value, 261), which is not statistically significant.

Conclusion: Surgical uterine evacuation utilizing MVA under local anesthetic is safe and successful, and it should be considered to minimize a lengthy hospital stay. MVA can be a viable alternative to surgical curettage like ENC. It is safe, cost-effective, and simple to conduct, eliminating general anesthetic, the requirement for theatre access, and an unnecessary hospital stay.

Keywords: Manual Vacuum Aspiration, Evacuation, Curettage, miscarriage, efficacy.

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INTRODUCTION

The term “spontaneous abortion” or miscarriage are having the same meaning and are interchangeable. It means pregnancy loss before 24 weeks of gestation without using any intentional intervention whether surgical or medicinal to end the pregnancy. [1] Miscarriage is the leading cause of pregnancy loss. [2] One out of every four women faces this in her lifetime. [3] More than 92% of all miscarriages occur in the first 12 weeks of gestation and the chances of miscarriage reduce with increasing duration of gestation thereafter. [4] According to local data of Pakistan, the yearly miscarriage rate in women aged 15 to 49 years is 29 per 1000. [5] Miscarriage, particularly incomplete and undetected miscarriage, affects roughly 15% of clinically diagnosed pregnancies and 890,000 women each year. [6]

Despite advancements in health technology, complications of miscarriage account for 10-13 percent of maternal deaths in underdeveloped nations. [7] Miscarriage can be treated medically or surgically. Surgical procedures have typically been utilized to treat early miscarriages. Sharp metal curettage is used in dilatation and curettage, which is frequently performed in an operating room under regional or general anesthetic. Sharp curettage is frequently performed following cervical dilation. [8] Manual vacuum extraction (MVA) is a surgical procedure that offers an alternative to established surgical methods. MVA is a uterine evacuation procedure that is safe, cost-effective, easy, and portable, and may be performed under local anesthetic. [9, 10] It may be conducted in any venue, including a clinic, ER, or operation theater. All healthcare workers including paramedical staff can perform it. To create the vacuum required for the aspiration of conception products, a 60 ml hand-held syringe is used. MVA was first reported in the 1970s, primarily for the treatment of incomplete miscarriage, but its application has since expanded to include the treatment of missed miscarriage, molar pregnancy, pregnancy termination, and endometri-

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al sampling. [11, 12] Manual vacuum aspiration is commonly employed in the United States, Asia, and Europe, but its application in Pakistan is limited. Vacuum aspiration is typically seen to be less risky than D&C as the latter can lead to various complications like cervical injuries, uterine perforation, significant blood loss, and pelvic infections. Though MVA is simple to use, physicians are unaware of its capabilities. [13, 14] There is currently relatively little local data on the issue. So, we conducted this study to compare the effectiveness of manual vacuum aspiration (MVA) against conventional evacuation and curettage (ENC) in first-trimester pregnancy losses.

MATERIALS AND METHODS

This study was carried out at the Department of Obstetrics and Gynecology, Khyber Teaching Hospital, Peshawar, Pakistan from October 2022 to March 2023 after taking permission from ethical committee No. 725/DME/KMC dated 05-10-2022. 150 women of any parity, having miscarriage with gestational age less than 12 weeks by LMP and age 18 to 35 years were included in the study by taking informed consent. They were equally and randomly divided into two groups, 75 being in the manual vacuum aspiration group (group A) and 75 in the conventional curettage group (group B). Women with ectopic pregnancy on ultrasound, molar pregnancy, and having a fever (temperature > 37.7^0 F) were excluded.

In group A, manual vacuum aspiration was carried out with a 60-cc syringe having a double-locking valve mechanism. The syringe was 'charged' to create a vacuum. A cervical block was applied under direct vision using a Cusco's speculum in the cervix. The cervix was kept patent by holding its anterior lip with the help of the Volsellum. A cannula with an appropriate size was inserted in the uterus and then it was attached to the charged syringe. Aspiration of the intrauterine contents is done through the syringe and cannula. The syringe was emptied into a bowl. The process was repeated several times until the uterine cavity was empty. In group B, conventional evacuation and curettage (ENC) was done under general anesthesia, with a sharp curette under an aseptic technique to evacuate the uterus or with moderate sedation and analgesia according to physician discretion. All patients were called for follow-up on the 7th day for transvaginal ultrasonography and efficacy was noted for each procedure. Normal endometrial thickness of less than 4 mm with no echogenic intra-cavity lesion, no echogenic foci associated with acoustic shadowing, and no fluid in the uterine cavity was considered efficacy. The data obtained was analyzed with a statistical analysis program (SPSS version 25). Frequency and percentage were calculated for qualitative variables. Mean ±SD was calculated for quantitative variables. The chi-square test was applied to compare efficacy in both groups taking a P value ≤ 0.05 as significant.

RESULTS

Out of a total of 150, 75 patients received treatment with MVA and 75 patients received treatment with ENC. The mean age in the MVA group (group A) was 27.81±6.31years while in the ENC group (group B) it was 26.50±6.27 years. The mean gestational age in group A was 5.82±2.82 weeks and it was 5.95±2.9 weeks in group B. Out of total 75 participants in group A, 7 (9.33%) women were primigravida, 59 (78.67%) women were multigravida and 9 (12%) women were grand-multigravida while in group B, 10 (13.33%) women were primigravida, 59 (78.67%) women were multigravida and 6 (8%) women were grand-multigravida. MVA was effective in 88% of participants while ENC was effective in 93.33% of participants (p-value, 261), which is not statistically significant [Fig. 1]. The efficacy of MVA in different age groups is given in figure 1.

MVA was effective in 6 Primigravida, 53 multigravidas, and 8 grand-multigravida while ENC was effective in 7 Primigravida, 58 multigravidas, and 5 grand-multigravida but these were not statistically significant [table-1 and 2]. MVA was effective in 45 women and 21 women with gestational age 1 to 7 weeks and 8 to 12 weeks respectively, while ENC was effective in 47 women and 23 women with gestational age 1 to 7 weeks and 8 to 12 weeks respectively. Again, these were also not statistically signif-

Table 1: Distribution of efficacy according to age groups

Age group	Efficacy	Group A	Group B	P value
≤ 20 years	Effective	15	17	0.931547
	Non-effective	1	1	
	Total	16	18	
21-30 years	Effective	20	28	0.745851
	Non-effective	2	2	
	Total	22	30	
≥ 30 years	Effective	31	25	0.292649
	Non-effective	6	2	
	Total	37	27	

Table 2: Distribution of efficacy according to parity

Parity	Efficacy	Group A	Group B	P value
Primigravida	Effective	6	7	
	Non-effective	1	3	
	Total	7	10	
Multigravida	Effective	53	58	
	Non-effective	6	1	
	Total	59	59	
Grand-multigravida	Effective	8	5	
	Non-effective	1	1	
	Total	9	6	

Table 3: Distribution of efficacy according to gestational age

Gravidity	Efficacy	Group A	Group B	P value
1-7 weeks	**Effective**	**45**	**47**	
	Non effective	**7**	**3**	
	Total	**52**	**50**	
8-12 weeks	**Effective**	**21**	**23**	
	Non effective	**2**	**2**	
	Total	23	25	

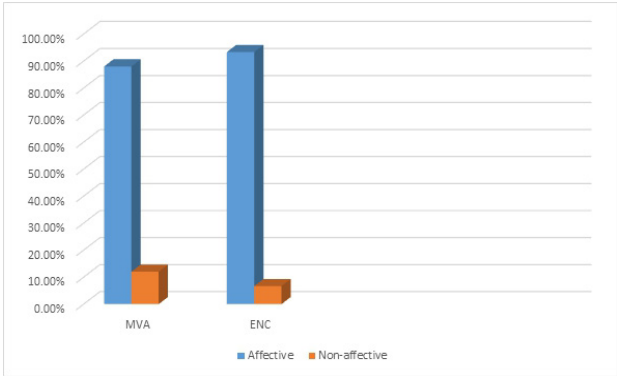

Fig 1: Distribution of efficacy in both groups

icant [table 3].

DISCUSSION

Many authors think that uterine evacuation in early pregnancy losses can be easily done via manual aspiration through syringing of the uterus (MVA) and it can be an alternative procedure to ENC, with the advantages of using analgesics or paracervical block instead of general anesthesia, a lower rate of complications, a shorter stay in hospital and lower hospital expenses. [15,16] Manual vacuum aspiration is becoming a preferred treatment in remote rural areas since it is acceptable, cost-effective, and less unpleasant. Despite being simple, affordable, and straightforward to use, its adoption has been limited since most doctors are unfamiliar with its application. MVA has been utilized in our institution for so many years and we have found it to be effective, safe, inexpensive, and simple to apply. In the current study, the mean age was 27.81±6.31years and 26.50±6.27 years in the MVA group and ENC group respectively. The age range in our study is comparable with the study conducted by Fatima Y et al who observed that patients in MVA and ENC groups are having ages 29.35± 6.4 and 28.04± 6.19 respectively. [17]

We observed the mean gestational age in the MVA group to be 5.82±2.82 weeks while in the ENC group, it was 5.95±2.9 weeks. Farooq F et al observed that the mean gestational age was 8.46±1.88 weeks and 8.32±1.56 weeks in ENC and MVA groups' respectively. [18] Fatima Y et al also showed nearly the same observation by obtaining the mean gestational age in the ENC group to be 8.46±1.88 weeks and the MVA group to be 8.32 ±1.56 weeks.[17] Our observations are comparatively different from both of the studies as both of them used a small sample size.

We observed that MVA was effective in 88% of participants while ENC was effective in 93.33% of participants with first-trimester miscarriage (p-value, 0.261). In a similar study, Ara J et al. found that the efficacy was 98% for MVA and 94% for ENC (p-value, 0.61). [19] The results of our study are not comparable to the study by Ara J et al because the sample size of our study is much bigger than other similar studies.

The above discussion shows that MVA is as effective as standard ENC. As it needs no general anesthesia

and operation theater, it can be easily performed even in basic rural health units. MVA might be considered frequently as an alternate option for managing early pregnancy loss and minimizing maternal morbidity and death, particularly in the hands of less trained personnel.

CONCLUSION

Surgical uterine evacuation utilizing MVA under local anesthetic is safe and successful, and it should be considered to minimize a lengthy hospital stay. MVA can be a viable alternative to surgical curettage like ENC. It is safe, cost-effective, and simple to conduct, eliminating general anesthetic, the requirement for theatre access, and an unnecessary hospital stay.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Akhtar N:	Concept, Critical appraisal, and Discussion Writing
Iqbal M:	Data collection, compilation of results, formatting of the article
Naz T :	Data Collection, Manuscript writing

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.