

## ORIGINAL ARTICLE

# Safety & efficacy of manual vacuum aspiration compared to dilatation & curettage in the management of early pregnancy failure

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### Abstract

**Background:** Early pregnancy failure is a major health problem across the globe. This is particularly important for the woman of Bangladesh.

**Objective:** The aim of our study was to evaluate the safety and efficacy of manual vacuum aspiration (MVA) compared to dilatation and curettage (D&C) in the management of first trimester abortion.

**Methods:** This was a prospective randomised study done in Obstetrics & Gynaecology department of Jessore medical college & Khulna medical college. Over a period of one year from January 2014 to December 2014, a total of four hundred women presented with spontaneous miscarriage with gestational age < 12 weeks patients with no sign of septic abortion and no history of pregnancy with fibroid uterus were included in the study.

**Results:** These patients underwent random selection either MVA group (n = 200) or D&C group (n=200). Cases were compared with respect to age, parity, gestational age, risk, blood loss, time taken & complications. The distribution of age, parity & gestational age was similar in both groups. The mean duration of procedure was significantly higher (P<.0001) in D&C group compared to MVA group. The duration of hospital stay was significantly lower (P<.0001) in MVA group compared to D&C group. Similarly the cost of the procedure was significantly lower (P<.0001) in MVA group compared to D&C group.

**Conclusion:** MVA is safe, effective, cheaper, less time consuming and requires shorter hospital stay. It does not require general anaesthesia and complication is also less than dilation and curettage. So it can be easily accessible to the woman of both rural and urban societies belonging to any socioeconomic strata specially where high tech equipments and power supply are not available.

**Key words:** Manual vacuum aspiration, Dilatation and Curettage, Early pregnancy failure.

### Introduction

Early pregnancy failure is a major health problem worldwide which occurs in 15-20% of pregnancies.<sup>1</sup> The World Health Organization (2003) estimates that 46 million pregnancies end in abortion each year and nearly 20 million of those are thought to be unsafe. An estimated 67,000 women die each year from unsafe abortion and hundreds of thousands more women suffer serious injuries and disabilities. About 13% of maternal deaths are due to unsafe abortion.<sup>2</sup> Unsafe abortions are a serious public health problem in Bangladesh and also a leading cause of maternal death. Even it persists in Bangladesh as an important cause of morbidity among women. Though the role of unsafe abortion as a cause of

maternal deaths appears to have declined greatly over the recent decade.<sup>3</sup> It can be serious health, economic and social consequences for woman and for society in short term and some extent in long term as well.<sup>4</sup>

The treatment options for early pregnancy failure include expectant management, medical termination with misoprostol and surgical evacuation. Traditionally first line surgical management has been dilatation and curettage (D&C) which requires a trained personnel, operating room, and presence of an anaesthetist and sometimes blood transfusion.<sup>5</sup> Despite careful and skilled intervention, even in best hands complication like haemorrhage, incomplete

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evacuation, perforation and infection can occur.<sup>6</sup> Manual vacuum aspiration as a means of removing uterine contents was pioneered in 1958 by Yuantai and Xianzhem in China that ultimately lead to the technique becoming a common and safe obstetric procedure.<sup>5-7</sup> Harvey Karmann in United States defined the technique in the early 1970s with the development of Karmann cannula, a safe, flexible that replaced the previously used hard metal cannula which reduced the risk of perforation.<sup>8</sup>

Out of all the recognized procedure of first trimester MTP, Electric vacuum aspiration has been used since years that have become standard surgical procedure for safe early pregnancy termination. This method can easily be performed in any setting, including an office, emergency room or the operating room and may be performed by a wide range of trained medical personals including midwives and nurses. When conducted in the outpatient setting rather than operating room MVA can result in substantial cost saving<sup>5,9</sup> and significant reduction in procedure time (3-7 minutes for MVA vs. 10.2 minutes for D&C).<sup>8</sup> MVA is highly portable, virtually silent, reusable and available at a low cost.<sup>9</sup> The present study was conducted to evaluate the safety and efficacy of manual vacuum aspiration (MVA) compared to dilatation and curettage (D&C) in the management of first trimester abortion. It is also to evaluate MVA that can be practiced in rural area where the access to the medical facilities are limited.

### Materials & Method

This prospective randomized study was done in obstetrics & gynaecology department, Jessore medical college hospital and Khulna medical college hospital over a period of 12 months from 1st January 2014 to 31st December 2014. During this period, four hundred women presenting with spontaneous miscarriage (blighted ovum, incomplete or missed abortion) with gestational age <12 weeks and no signs of septic abortion (fever >37.7c, purulent vaginal discharge, tachycardia or abdominal pain) were included in the study. Patient with septic abortion, ectopic pregnancy, molar pregnancy, pregnancy with fibroid uterus and unwilling patients were excluded from the study. Among 400 patients, 2 (two) hundred patients underwent MVA and D&C were done in remaining 2 (two) hundred. The patient was selected randomly. Preliminary investigations done were haemoglobin estimation, blood grouping & Rh typing, random blood sugar. Written informed consent was taken. The procedure and its probable complications were explained to the patients.

Dilatation & curettage was done in the operation theatre under general anaesthesia, and MVA was carried out in examination room under local (Para cervical block) anaesthesia, in most of the cases with Ipas MVA system which consist of an aspirator and cannula. The patients in each group with missed abortion and closed cervical os were given 200mg of misoprostol per vaginally 3 hours before the procedure. 400 mg of ibuprofen was given to the patient orally half an hour before MVA. 10 unit oxytocin was given to every patient during the procedure. All the procedures were conducted by consultants & senior registrars. The patients were assessed regarding complication of evacuation, duration of procedure, cost & duration of hospital stay. Completion of the procedure was confirmed by sharp curettage or ultrasound if needed. Blood loss was assessed by amount of blood present in the aspirator syringe while in D&C; the blood loss was collected in the kidney tray and measured. After the procedure patients were transferred to the recovery room. Most of the patients with MVA were discharged from there within 4-5 hours while most of the patients who had D&C were shifted to the ward and discharged from there when stable. Antibiotic & pain killer was given in all cases for 5 days. Patients were followed up after one week to see any sign of infection including pain in lower abdomen, fever, vaginal discharge. Bimanual examination was done to assess the size of uterus and vaginal bleeding. In any complication management was done accordingly.

The data of the patients were collected on a structured questionnaire and analyzed using spss-17. Chi square test was used to compare the percentage. The 'p' value less than 0.05 was taken as significant.

### Result

Between January 2014 to December 2014, 400 (four hundred) patients with first trimester spontaneous abortion were enrolled in this study and half underwent either MVA group (n=200) or D&C group (n=200). Table I demonstrates the six variables obtained: age, parity, gestational age, indication of procedure, risk factor and previous history of abortion. The demographic and obstetric variable of both groups were similar, no statistically significant difference. The age of the women range from 18-45 years. The mean age of the women was 24.9 years in MVA group and 25.3 years in D&C group. The parity ranged from 0-5 and gestational age ranged from 5-12 weeks. The mean gestational age in MVA group was 9.3 weeks and D&C group was 9.5 weeks. Though all patients

f D&C groups, procedure were performed under general or regional anaesthesia but majority of MVA group procedure was performed under Para cervical block. Only 3 (1.5%) of the MVA cases required additional administration of general anaesthesia due to intolerability of pain despite para cervical & systemic analgesia.

**Table I**

Baseline characteristics of the study population			
	MVA (n=200)	D&C (n=200)	P value
Age	24.9	25.3	.4236
Parity (%)			
Primigravida	75	81	.2087
Multigravida	125	119	.6747
Gestational age (weeks)	9.3	9.5	.4027
Indication for procedure (%)			
Blighted ovum	19	38	.0002
Incomplete abortion	125	110	.8877
Missed abortion	56	52	.7569
Risk Factors (%)			
Low risk patient	168	179	.2505
High risk patient	32	21	.0000
HTN	2	1	.9999
DM	23	15	.9999
Previous LSCS	7	5	.9991
Previous history of abortion	40	50	.0095

The complications of the procedure which includes anaesthetic complication, blood loss >100ml, cervical trauma, perforation, infection & incomplete evacuation. Overall, the complications was significantly higher (P<.0001) in D&C group 27 (13.5%) compared to 8 (4%) in MVA group (Table-II). There were no statistically significant difference in complete evacuation rate 97% for MVA group and 99% for D&C group (p=0.153).

**Table II**

Complications in both groups

Complication	MVA (n=200)	D&C (n=200)	P value
Early			
Anaesthetic hazards	0	10	
Blood loss >100ml	0	9	
Cervical trauma	0	4	
Uterine Perforation	1	1	.4866
Late			
Incomplete evacuation	6	2	.153
Infection	1	1	.4866
Total	8	27	.0001

There was no mortality & no patient needed blood transfusion. Only 8 patients in both groups had incomplete evacuation and underwent standard curettage in operation room. The two cases of

uterine perforation in both groups did not require surgery.

**Table III**

Comparison of procedure related outcome in both groups

Outcome of procedure	MVA (n=200)	D&C (n=200)	P value
Product of conception from uterine cavity(ml)	19.9	23.4	.0443
Duration of procedure (min)	6.5	15.3	.0001
Duration of Hospital stay (hrs)	4.5	22.3	.0001
Cost (taka)			
500-1500	195	5	.0001
1501-2500	3	175	.0001
>2500	2	20	.0001

Product of conceptions obtained from uterine cavity (ml) which was significantly higher in D&C group (23.4gm) compared to 19.8gm in MVA group (p<.0443). The mean duration of procedure was significantly higher (p<.0001) in D&C group (15.3 mins) compared to (6.5 min) in MVA group. The duration of hospital stay was significantly lower (p<.0001) in MVA group (4.5 hrs) as compared to 22.3 hrs in D&C group.

## Discussion

Manual vacuum aspiration is a method of uterine evacuation that enables women with early pregnancy loss to be treated safely in the office or emergency department rather than the operating room.<sup>10</sup> Today women are diagnosed by ultrasound prior to haemorrhage or infection and can be safely managed by office based Manual vacuum aspiration (MVA). Use of MVA includes endometrial biopsy, uterine evacuation in case of pregnancy failure and pregnancy termination. The instrument set includes the Ipas aspirator used for an office based MVA is reusable after appropriate processing.<sup>11</sup>

In our study, maximum number of gestational age ranged from 9 to 11 weeks, median gestational age being 9.3 weeks and 9.5 weeks for each procedure. In retrospective Cohort analysis of Goldberg et al the women undergoing MVA were up to 10 weeks gestational age and Westfall studied MVA up to 10 weeks gestation which are compatible with other study.<sup>12,13</sup>

In the present study, the mean procedure time was 6.5min for MVA group and 15.3 min for D&C group. So, the mean duration of the procedure was significantly higher (p<.0001) in D&C compared to

MVA. This is due to most of the patients in MVA group visited either the Emergency room or the outpatient department. Hence, the procedure was promptly carried out. The average hospital stay was 4.5 hrs for MVA groups, 22.3 hrs for D&C group. So the duration of hospital stay was significantly lower ( $p < .0001$ ) in MVA group. These results were agreed with Tune alp O et al study, Koontz SL et al and Kulier R et al study.<sup>14-16</sup> Similarly the cost of procedure was also significantly lower ( $p < .0001$ ) in MVA group. This finding was compatible with Thanapan et al. study and also Mahamed Abd Elzahar et al study.<sup>17-18</sup> In another study conducted by Khani et al. compared MVA with curettage. The duration of surgery was significantly shorter in MVA group and patient had more bleeding in curettage group.<sup>19</sup> These results correlated well with the findings of our study.

There was more complication in the curettage group as compared to MVA group in the present study. But most of these were minor complication and were managed easily. Two patients are in each group who had perforation had to manage conservatively. Six patients in the MVA group and two patients in curettage group had re-evacuation of the uterus due to retained product of conception which was confirmed by ultrasonography. High vaginal swabs of the patients with infection (1% in each group) were taken and they were given antibiotics according to culture and sensitivity. Overall complication was significantly lower in MVA group compared to D&C group. Data from a major retrospective study of 1677 MVA procedure for elective abortion showed 99.5% effectiveness and minimal complication (0.5% repeat aspiration, 0.7% infection & 0.6% uterine perforation.<sup>13</sup> The two procedures did not show much difference as far as their effectiveness was concern (97% in MVA and 99% in curettage group). Several studies done else where show the same result for MVA. Paul et al showed 98% efficacy for MVA, Hemlin & Moller 2001 showed it to be 98%, Goldberg et al found MVA to be effective in 97.8%. Westfall also found MVA to be effective in 99.6%.<sup>13, 20-22</sup>

In our study manual vacuum aspiration was associated with a low rate of complication and also there was no maternal death. Two factors may be associated with its low complication rate. Prior cervical dilatation with small cervical dilator decreases the chance of cervical injury or uterine perforation. Secondly the surgeon in this study was quite experienced in MVA and very comfortable with intrauterine procedure.

## Conclusion

MVA is safe, effective, cheaper less time consuming, and requires shorter hospital stay. It does not require general anaesthesia and complication is also less. So the judicious use of MVA comes with a promise to make early abortion safe and easily accessible to women of both rural and urban societies, specially where high tech equipments and power supply are not available.

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