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Comparative Study of Manual Vacuum Aspiration and Dilatation & Evacuation for the Surgical Management of Early Pregnancy Loss

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Abstract

Background: To compare manual vacuum aspiration and dilatation and evacuation as the method for early pregnancy loss surgical management.

Methods: This study was conducted in the Department of Obstetrics and Gynaecology, SMS Medical College & Associated group of Hospitals, Jaipur during this study, 200 pregnant women with below 12 weeks gestational age having a confirmed diagnosis of incomplete miscarriage and missed abortion were included. All selected cases divided into MVA group and D&E group randomly.

Results: Patient came more frequently with complaints like pain abdomen, sepsis, vaginal bleeding and RPOCs on USG in D&E group as compared to MVA group. MVA was effective in 98% cases versus D&E was effective in 94% cases.

Conclusion: We concluded that MVA is better than D&E though our study is small and larger and multicentric studies are required to endorse our results.

Keywords: MVA, D&E, Pregnancy loss.

Introduction

Early pregnancy failure is a major health problem worldwide which occurs in 15–20% of pregnancies.[1] In developing countries like india complications of miscarriages account for 10–12% of maternal deaths. [2,3] 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 (DNC) which requires a trained personnel, operating room, presence of an anaesthetist and sometimes blood transfusion.[4] Despite careful and skilled intervention, even in best hands complications like haemorrhage, incomplete evacuation, perforation

and infection can occur.[5] Manual vacuum aspiration as a means of removing the uterine contents was pioneered in 1958 by Yuantai and Xianzhen in China that ultimately led to the technique becoming a common and safe obstetric procedure.[4,6] Harvey Karmann in the United States refined the technique in the early 1970s with the development of Karman cannula, a soft, flexible cannula that replaced the previously used hard metal cannula which reduced the risk of perforation. Overall effectiveness and patient satisfaction for MVA are much higher, and complication rates much lower than DNC. [7] This method of evacuation is safe and 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 personnel including midwives and nurses. When conducted in the outpatient setting rather than operating room, vacuum uterine aspiration can result in substantial cost savings[4,8] and significant reduction in procedure time (3.7 minutes for MVA vs 10.2 minutes for DNC)[7] MVA is highly portable, virtually silent, reusable, and available at a low cost.[8] So far there is very little local data available on the subject.

Material And Methods

Study setting: The study was conducted in the Department of Obstetrics and Gynaecology, SMS Medical College & Hospital, Jaipur.

Study Design: Hospital based prospective study.

Study Type: Randomized controlled study.

Study Population: The study population comprises of pregnant women with first trimester pregnancy loss attending Obstetrics and Gynaecology Department in SMS Medical College and Hospital, Jaipur who fulfill the inclusion criteria.

Selection Criteria

Inclusion Criteria

- Pregnant women with gestational age less than 12 weeks and having a confirm diagnosis of early pregnancy loss was included in the study.
- Willing to participate in study.

Exclusion Criteria

Patients with molar pregnancy, septic abortion and other comorbidities like uterine anomalies; coagulation disorders etc. were excluded from the study.

- Non cooperative
- Severely ill

Sampling Methods: All eligible consecutive patients.

Data Collection: The diagnosis of early pregnancy loss was made on the basis of history, clinical examination, biochemical examination, pathological examination and pelvic ultrasound. These study population was randomly divided into two groups "A" and "B". The women in group A (100 pregnant women) was undergo MVA (Manual Vacuum Aspiration) and the others in group B (100 pregnant women) was undergo dilatation and evacuation for the management of early pregnancy loss. Patients was kept under observation for any complication for 24 hours. Efficacy of the procedure was confirmed by pelvic ultrasound and patients were called for follow up at two weeks.

Data Analysis

- Continuous variables was presented has been as S.D. and was analyzed by using unpaired 't' test
- Nominal / categorical variables was expressed as proportion and will be analysed by using chi-square test/fisher exact test.
- P value <0.05 was taken as significant Medcalc 16.4 versions software was used for all statistical analysis.

Results

Table 1: Distribution of Patients according to socio-demographic variable

Variable	MVA (Group A)	D & E (Group B)	p-value
Age (Mean ± SD)	24.00±4.0	24.06±3.5	0.91
Gravida (Mean ± SD)	2.4±1.01	2.6±1.4	0.245

This table shows distribution of case in both groups according to age maximum number of patients are 20-25 years in both groups.

Table 2: Distribution of patients according to level of pain

Pain	MVA (Group A)		D&E (Group B)		
	No	Percentage (%)	No	Percentage (%)	
Mild	44	44	6	6	0.927
Moderate	50	50	81	81	
Severe	6	6	13	13	

This table shows in MVA group majority of women experienced mild (44%) to moderate (50%) pain and 6% cases experienced severe pain. In D&E group 6% cases had mild, 81% cases had moderate pain and 13% case experienced severe pain. Moderate and severe pain was more in D&E group but 'p' value was not significant.

Table 3: Distribution of patient according to duration of procedure

Duration (minutes)	MVA (Group A)		D&E (Group B)	
	No.	Percentage (%)	No.	Percentage (%)
≤5 Min	54	54	2	2
6-10 Min	40	40	67	67
11-15 Min	6	6	31	31
Total	100		100	
Mean ± SD	6.52 ± 2.6		10.2 ± 2.6	
p-value	<0.01			

This table shows that in MVA group 54% cases had duration of procedure less than or equal to 5 min, 40% cases had duration of procedure between 6-10 min and 6% cases had duration of procedure between 11-15 min & the Mean±SD was 6.52±2.6 min. While, in D&E group 2% cases had duration of procedure less than or equal to 5 min, 67% cases had duration of procedure between 6-10 min and 31% cases had duration of procedure between 11-15 min, the Mean±SD was 10.2±2.6 min, p value <0.01 which was significant.

Table 4: Distribution of patients according to duration of Hospital Stay

Stay in Hospital (Hours)	MVA (Group A)		D & E (Group B)	
	No	Percentage (%)	No	Percentage (%)
<5	82	82	10	10
5-8	16	16	62	62
9-12	0	0	18	18
>12	2	2	10	10
Total	100		100	
P value 0.001				

This table shows in MVA group, majority of patients (82%) stayed in hospital for less than 5 hours followed by 16% cases stayed in hospital for 5-8 hours and only 2% cases stayed in hospital for more than 12 hours. In D&E group 10% cases stayed in hospital for <5 hours majority of patients i.e. 62% patients stayed in hospital for 5-8 hours followed by 18% cases stayed for 9-12 hours but 10% cases stayed in hospital for more than 12 hours. Mean hospital stay in D&E group was 8.46±4.33 hrs was much more than MVA group which was 4.23± 2.4 hours. 'p' value is significant (0.001).

Table 5: Distribution of patients according to Haemoglobin level before and after the procedure

Haemoglobin gm%)	MVA (Group A)		D & E (Group B)	
	Before Procedure	After Procedure	Before Procedure	After Procedure
<6	0 (%)	0 (0%)	0 (0%)	0 (0%)
6-7.9	2 (2%)	3 (3%)	7 (7%)	20 (20%)
8-9.9	94 (94%)	93 (93%)	93 (93%)	80 (80%)
≥10	4 (4%)	4 (4%)	0 (0%)	0 (0%)

This table shows in MVA group 94 cases founded haemoglobin level between 8 to 9.9% before procedure and 93 cases founded haemoglobin level 8-9.9 gm% after procedure. In D&E group 93 cases founded

haemoglobin level between 8 to 9.9% before procedure and 80 cases founded haemoglobin level 8-9.9 gm% after procedure, indicating blood loss is slightly more in D&E group.

Table 6: Distribution of patients according to cervical trauma during procedure

Cervical Trauma	MVA (Group A)		D&E (Group B)	
	No	Percentage (%)	No	Percentage (%)
Yes	0	0	2	2
No	100	100	98	98
Total	100		100	

This table shows no cervical trauma was found in MVA group. In D&E group only 2% case had cervical trauma and 98% cases had no cervical trauma.

Table 7: Distribution of patients according to amount of blood loss during procedure

Blood Loss (ml)	MVA (Group A)		D&E (Group B)	
	No	Percentage (%)	No	Percentage (%)
<100	100	100	89	89
>100	0	0	11	11
Total	100		100	
Mean±SD	10.2±2.6		41.17±6.4	
p-value	<0.01			

This table shows that in MVA group all the cases had blood loss less than 100 ml and the mean blood loss was 10.2±2.6 ml. In D&E group 89% cases had blood loss less than 100 ml and only 11% cases had blood loss greater than 100 ml with the mean blood loss was 41.17±6.4 ml. 'p'-value is significant (<0.01).

Table 8: Distribution of patients according to complications during procedure

Complication	MVA (Group A)		D & E (Group B)	
	No.	Percentage (%)	No.	Percentage (%)
Shock	0	0	0	0
Perforation	0	0	0	0
Pallor	4	4	12	12
p value 0.0370				

In our study no perforation and shock was founded in MVA & D&E group during procedure. Pallor was more in D&E group than MVA group (p value 0.0370).

Table 9: Distribution of patients according to complain on follow up

Follow Up	MVA (Group A)				D&E (Group B)				p value
	Yes		No		Yes		No		
	No.	%	No.	%	No.	%	No.	%	
Pain Abdomen	3	3	97	97	25	25	75	75	0.027
Sepsis	1	1	99	99	24	24	76	76	0.000
Vaginal Bleeding	5	5	95	95	21	21	79	79	0.002
RPOCS on USG	2	2	98	98	6	6	94	94	0.279

This table shows that in MVA group during follow up complaints like pain abdomen, sepsis, vaginal bleeding and RPOCs on USG were present in 3%, 1%, 5%, and 2% cases respectively. Similarly in D&E group during follow up complaints like pain abdomen, sepsis, vaginal bleeding and RPOCs on USG were present in 25%, 24%, 21% and 6% cases respectively. On follow up complications were found more in D&E group than MVA group.

Table 10: Distribution of patients according to success rate

	MVA (Group A)		D&E (Group B)	
	No	Percentage (%)	No	Percentage (%)
Successful	98	98	94	94
Failure requiring re-procedure	2	2	6	6
Total	100		100	
p value 0.148				

This table shows that in MVA group 98% cases were successful and failure was in 2% which required re-procedure. In D&E group 94% cases were successful and failure was in 6% cases which required re-procedure. Success rate was founded more in MVA group than D&E group.

Discussion

MVA 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. Today women are diagnosed by ultrasound prior to haemorrhage or infection and can be safely managed by office based 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. The present study was conducted to evaluate the safety and efficacy of MVA compared to dilatation and evacuation (D&E) 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[9].

In our study, in MVA group majority of patients had duration of procedure between <5 min was 6.52±2.6 minutes. In D&E group majority of patients had duration of procedure between 6-10 min was 10.2±2.6 minutes (p value <0.01). In concordance with this study by Ghafar et al[10] found that in MVA group majority of cases (92%) consume 10 min for procedure and in D&E group majority of cases (84%) consume 15 min for procedure.

Jayashree et al[11] found that in D&C only 12.5% cases had lesser than or equal to 5 minutes of duration of procedure. In D&C, most of the patients had 6 to 10 minutes of procedure (N=62, 77.5%) and 10% patient in had duration in excess of 10 minutes. The average duration of procedure in D&C was 7.89±2.08 min whereas it was only 5.93±1.11 minutes in MVA. The difference was statistically significant (p value <0.01)

In our study, majority of patients (82 cases) stayed in hospital for less than 5 hours followed by 16 cases stayed in hospital for 5-8 hours and 2 cases stayed in hospital for more than 12 hours in MVA procedure. Mean hospital stay in MVA group was 4.23±2.4 hours. In D&E group majority of patients (n=62) stayed in hospital for 5-8 hours followed by 18 cases stayed for 9-12 hours. Mean hospital stay in D&E group was 8.46±4.3 hours, which was consistent with the study done by Ghazala et al[12] found that mean hospital stay in MVA group was 4±1.28 hours and in sharp curettage group was 40 ±5.77 hours.

In the present study in MVA group 3 cases founded haemoglobin level between 6 to 7.9% after procedure and 93 cases founded haemoglobin level 8-9.9gm% after procedure while in D&E group 20 cases founded haemoglobin level 6-7.9gm% after procedure and 80 cases founded in haemoglobin 8-9.9gm% after procedure indicating blood loss is slightly more in D&E group

In our study, cervical trauma were in D&E group as compared to MVA group and comparable with the study done by Ghafar et al[10] in which 5 cases (10%) had cervical laceration in D&C group, 1 case (2%) in EVA group and 2 cases (4%) in MVA group (table - 8).

In present study, in MVA group, all cases had blood loss < 100 ml (10.2±2.6 ml). In D&E group, 89% cases had blood loss less than 100 ml and only 11% cases had blood loss >100 ml (41.17±6.4 ml). This difference was statistically significant (p value = 0.0001) and comparable with the study done by Jayashree et al[11] who found that excess blood loss was higher (N=17, 21.3%) in D&C group when compared to MVA group where no excess blood loss was reported. In their study the mean blood loss in D&C was 74.31±25.12 ml

whereas it was 33.75±9.19 ml in MVA. The difference was statistically significant (P<.05)

In our study, in MVA group, 96% cases did not require any blood transfusion and 4% cases required blood transfusion. In D&E group, 88% cases did not required any transfusion and 12% cases required blood transfusion. Our rate of blood transfusion was more than the study of Jayashree et al[11] found that blood transfusion was required in 3.8% (N=3) in D & C and not at all in MVA group. The reason could be preprocedure pallor due to chronic anaemia or late attending of patients In our study no perforation and shock was founded in MVA & D&E group during procedure. Pallor was more in D&E group than MVA group. These results were correlating with the study by Forna F, et al (2001)[13]. Two trials were included. Vacuum aspiration was associated with statistically significantly decreased blood loss (-17 mls weighted mean difference, 95% confidence interval (CI) -24 to -10 mls), less pain (relative risk (RR): 0.74, 95% CI 0.61, 0.90), and shorter duration of procedure (-1.2 minutes weighted mean difference, 95% CI -1.5 to -0.87 minutes), than sharp curettage, in the single study that evaluated these outcomes. Serious complications such as uterine perforation and other morbidity were rare and the sample sizes of the trials were not large enough to evaluate small or moderate differences.

In our study MVA group patients during follow up were presented with complaints of pain abdomen, sepsis, vaginal bleeding and RPOCs on USG in 3%, 1%, 5% and 2% respectively. While, in D&E group patients during follow up were presented with complaints of pain abdomen, fever, vaginal bleeding and RPOCs on USG were presented in 25%, 24%, 21% and 6% respectively requiring repeat procedure.

Our study is concordence with the study done by Jayshree et al[11] who found that the presence of retained products and the need for repeat procedure was observed in 2.5% of MVA cases versus 10% in D&C group. Result were also comparable to Yin 2005[65], Suwan A *et al*, 2009[66]. In our study the success rate of MVA group was 98% cases. While D&E group success rate was 94%.

Conclusion

MVA is safe, effective, cheaper less time consuming, and requires shorter hospital stay. It does not require general anaesthesia and complications are also less. Both the techniques i.e. MVA & D&E for management of early pregnancy loss are simple and safe and do not require any specified sophisticated equipment can be performed without anaesthesia.

On comparison of the two, in our study MVA was seen to be having an edge over D&E, regarding blood loss, degree of pain, hospital stay, complication and success rate. So to conclude we can say that MVA is better than D&E though our study is small and larger and multicentric studies are required to endorse our results.

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