

Comparison of Manual Vacuum Aspiration with Electrical Vacuum Aspiration in management of first trimester miscarriages

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ABSTRACT

Aim: To compare manual vacuum aspiration with electrical vacuum aspiration for management of first trimester miscarriages in terms of mean blood loss and mean duration of hospital stay.

Methods: A randomized controlled trial conducted at department of Obstetrics and gynecology unit II, Farooq teaching hospital of Akhtar Saeed Medical and Dental College Lahore, from 1st January 2014 to 31st December 2015. Two hundred patients presenting with first trimester miscarriage (gestational age less than 12 weeks) of all age groups and parity were randomly distributed into two groups. Patients in group A underwent electric vacuum aspiration (EVA) and patients in group B were offered manual vacuum aspiration (MVA). Independent sample t-test was used to compare blood loss and duration of hospital stay between the two groups.

Results: MVA was superior to electric vacuum aspiration in terms of significantly less blood loss (31.14±5.30ml vs. 39.58±4.39ml; p=0.0001) and shorter duration of hospital stay (6.53±1.56 hours vs. 14.13±1.77hours;p=0.0001).

Conclusion: MVA is safe and effective with less bleeding and less duration of hospital stay.

Keywords: Manual vacuum aspiration, electrical vacuum aspiration, miscarriages.

INTRODUCTION

Early pregnancy loss or miscarriage is a common gynecological problem faced by women of reproductive years¹. The incidence of miscarriage in clinically recognizable pregnancy is 10-20%². The documented pregnancy loss rate is 29 per 1000 in women aged 15-49 years¹. Mostly women suffer at least one pregnancy loss by the time they are 45 years³. Unsafe abortions account for 10-13% of maternal mortality in the developing countries¹.

Most women will present to the hospital in a number of ways as bleeding with pain, bleeding without pain, bleeding with pain with symptoms and signs of blood loss or absence of bleeding with pregnancy symptoms diminishing⁴.

First trimester pregnancy losses can be managed medically, surgically or by expectant management. Up to 88% of women with miscarriage undergo surgical evacuation under general anesthesia⁵. Manual vacuum aspiration is a simple, safe and effective procedure. MVA was introduced by Wu Yuntai and Xianzhen in China in 1958. MVA had been used effectively and safely over decades for management of early pregnancy losses⁶.

In one study manual vacuum aspiration was effective in 98% and electrical vacuum aspiration in 97% cases. So the efficacy of both procedures was not much different⁷.

Furthermore manual vacuum aspiration was used less often than electrical vacuum aspiration based on the fact that randomized controlled trials were not available to compare safety and effectiveness of the two procedures³. In a study conducted at PIMS manual vacuum aspiration was associated with less blood loss and shorter hospital stay¹. Another study revealed less blood loss with manual vacuum aspiration (35ml) as compared to electrical vacuum aspiration (42ml)⁷.

Manual vacuum aspiration is done by using a 60ml syringe attached to a flexible cannula. This syringe has self locking plunger to create vacuum that helps in aspiration of products of conception. It is performed under local anesthesia⁵. Manual vacuum aspiration could offer logistical advantages that it does not require electricity, general anesthesia or operating room facilities⁸.

This study will provide an insight to increase the use of MVA over EVA, stressing the benefits of less blood loss, less hospital stay and no need of general anesthesia for MVA. So in remote areas of Pakistan where electricity is the main problem and lack of trained medical staff, the use of MVA is a blessing for the poor patients in terms of efficacy, safety and acceptability MVA has been used worldwide but only

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few local studies are available to prove efficacy of MVA over EVA. Previous studies showed variability regarding its use so my study will stress its use in future which would be very helpful for patients.

MATERIALS AND METHODS

This study was conducted at department of Obstetrics and Gynecology unit II at Farooq Hospital Westwood/ Akhtar Saeed Medical and Dental College, Lahore from 1st January 2014 to 31st December 2015 after approval by Ethical Review Board of the Hospital. Two hundred patients presenting with first trimester miscarriage (gestational age less than 12 weeks) of all age groups and parity were included in the study. Patients with uterine anomalies, molar pregnancy, suspected ectopic pregnancy and hemodynamically unstable patient were excluded from study.

The identity of patients recorded and an informed consent obtained from all the patients or their guardians to include their data in research work. Exclusion criteria were strictly followed and all risks associated with both procedures explained in detail.

After taking detailed history and performing examination blood sample of 5 ml taken and baseline investigations including blood group, hemoglobin, blood sugar level and hepatitis B and C screening done. All patients randomly divided into 2 groups by using computer generated random number table. Group A had electrical vacuum aspiration and group B had manual vacuum aspiration. Prophylactic antibiotic were administered. EVA was performed in conventional way under general anesthesia and MVA was performed using a 60ml syringe attached to a flexible cannula, under paracervical block, by post graduate registrar and consultants. Blood loss during the procedure was measured in milliliters by blood collected in suction apparatus in group A and in manual vacuum aspirator in group B. Average stay of the patient from time of admission to time of discharge was recorded in hours for both procedures. All the data was collected and recorded on a predesigned proforma.

Data analysis was done by using SPSS Version-10. Mean and standard deviation were calculated for variables like age, gestational age, blood loss and hospital stay and independent sample t-test was used to compare blood loss and duration of hospital stay between 2 groups. P value ≤ to 0.05 was taken as significant.

RESULTS

A total of 200 women with first trimester miscarriage were enrolled in the study. 100 women had

undergone MVA and 100 women EVA. Characteristics of the study population at enrollment were similar in two groups. Out of 200 patients, mean age of patients was 27.60±4.93 years. Minimum age was 18 years while maximum age was 38 years. In group A (EVA group) mean age of patients was 27.76±4.64 years. In group B (MVA group) mean age of patients was 27.44±5.22 years. In both procedures maximum number of cases was in age group 20-30 years, followed by age group > 30 years. Least number was in age group < 20 years. There is no statistical significant difference (p>0.05) in age of the patients in both groups.

Table 1: Comparison of blood loss (ml) in both groups.

Groups	N	Mean	Std. deviation
Group A(EVA)	100	39.58	4.39
Group B(MVA)	100	31.14	5.30

Independent samples test Sig.(2-tailed): 0.0001

Table 2: Comparison of duration of hospital stay in hours in both groups

Groups	N	Mean	Std. deviation
Group A(EVA)	100	14.13	1.77
Group B(MVA)	100	6.53	1.56

Independent samples test Sig.(2-tailed): 0.0001

Table 3: Stratification of age, gestational age and parity with respect to blood loss.

Variable	Group A	Group B	P value
Age			
<20 years	n = 1	n = 6	0.035
	42 ± 0	29.33±4.08	
20-30 years	n = 71	n = 64	0.0001
	39.17±4.3	30.58±5.26	
>30 years	n =28	n =30	0.0001
	40.54±4.59	32.7 ± 5.4	
Gestational age			
< 7 weeks	n = 43	n = 39	0.0001
	35.3 ± 2.52	26.38 ± 4.1	
> 7 weeks	n = 57	n = 61	0.0001
	42.81±2.14	34.18±3.42	
Parity			
< 3	n = 78	n = 84	0.0001
	39.24 ± 4.3	30.96±5.03	
> 3	n = 22	n = 16	0.0001
	40.77±4.57	32.06±6.66	

Among 200 patients mean gestational age of patients was 7.53±1.13 weeks. Minimum gestational age was 5 weeks while maximum gestational age was 10 weeks. In group A mean gestational age was 7.54±0.95 weeks. In group B mean gestational age was 7.51±1.30 weeks. In both groups maximum number of patients was in gestational age group of > 7 weeks. Their p value=0.565 which is statistically insignificant. Among 200 patients mean parity of the patients was 2.49±1.30, with minimum parity of 1 and

maximum of 6. In both groups maximum number of patients was in parity group of ≤ 3 . Their p value is 0.279 which is statistically insignificant.

Table 1 is showing comparison of blood loss (in ml) between two groups, their p value= 0.0001 which is highly statistically significant. Table 2 is showing comparison of duration of hospital stay between the two groups. Their p value=0.0001 is highly statistically significant. Table 3 is showing stratification of age, gestational age and parity regarding blood loss in ml in both groups. Table 4 is showing stratification of age, parity and gestational age regarding hospital stay in hours in both groups. The results are statistically significant showing p value of 0.0001.

Table 4: Stratification of age, gestational age and parity with respect to duration of hospital stay.

Variable	Group A	Group B	P value
Age			
<20 years	n = 1	n = 6	0.057
	12 \pm 0	7.33 \pm 1.75	
20-30 years	n = 71	n = 64	0.0001
	13.75 \pm 1.51	6.44 \pm 1.4	
>30 years	n = 28	n = 30	0.0001
	15.18 \pm 1.98	6.57 \pm 1.83	
Gestational age			
<7 weeks	n = 43	n = 39	0.0001
	13.53 \pm 1.58	5.67 \pm 1.38	
> 7 weeks	n = 57	n = 61	0.0001
	14.58 \pm 1.79	7.08 \pm 1.42	
Parity			
< 3	n = 78	n = 84	0.0001
	13.81 \pm 1.59	6.43 \pm 1.43	
> 3	n = 22	n = 16	0.0001
	15.27 \pm 1.96	7.06 \pm 2.08	

DISCUSSION

MVA has been used worldwide since many years for the management of early miscarriages owing to its efficacy, safety and acceptability but still our healthcare professionals are reluctant to use it due to unfamiliarity with its use.

Various studies have been done to prove the safety and efficacy of MVA for first trimester abortion. Few local studies are done to compare MVA with the conventional EVA methods.

The present study has also been undertaken to compare MVA and EVA for first trimester miscarriages. The amount of blood loss and duration of hospital stay have been studied and compared between MVA and EVA.

All the women in our study were in 1st trimester. A study by Goldberg et al also included women upto 10 weeks of gestational age⁹. Davis A studied MVA on 1677 patients where majority were upto 10 weeks

gestation.¹⁰ Similar results were observed in the present study.

In the present study the amount of blood loss in two groups is statistically significant, with mean blood loss of 31.14 \pm 5.30 ml in MVA vs. 39.58 \pm 4.39 ml in EVA (P=0.0001).

This observation is comparable to study by Goldberg et al showing p- value of <0.001 which was statistically significant⁹.

In a study conducted at PIMS (Pakistan), MVA was associated with significantly less blood loss (62.08 \pm 32.19 vs. 75.71 \pm 35.53; p=0.008)¹.

According to Davis A, bleeding after MVA lasts for shorter duration¹⁰. In another study conducted by Kerure SB, it was found that 72% cases in MVA had grade I bleeding and 48% cases in EVA had grade II bleeding. The bleeding after MVA was less as compared to EVA¹¹.

In current study duration of hospital stay was significantly less in MVA group with mean duration of hospital stay being 6.53 \pm 1.56 hours in MVA vs. 14.13 \pm 1.77 hours in EVA.(P=0.0001). This was comparable with Crenin MD (1997), who found that duration of hospital stay was significantly less in MVA being 5.8 hours as compared to 19.3 hours in EVA.(P<0.05)¹². A study by Bluementhal PD also supported our findings¹³.

Koontz SL and colleagues compared MVA with sharp curettage and interpreted that MVA has shorter hospital stay of 28% as compared to sharp curettage¹⁴.

Khani et al conducted a study comparing MVA with curettage and concluded less blood loss and shorter duration of procedure in MVA group¹⁵.

A Brazilian study by Pereira et al concluded that duration of procedure and hospital stay were significantly shorter in MVA group¹⁶. The results are comparable with our study.

A recent local study done in Karachi comparing manual vacuum aspiration with suction and curettage showed statistically significant difference in terms of hospital stay and blood loss in MVA group¹⁷. These results are comparable with results of the current study

Mansoor et al also showed shorter duration of procedure in patients undergoing MVA for first trimester pregnancy losses¹⁸. Similar trend was observed by Kerure et al. He found out that women undergoing MVA had less blood loss when compared with electrical vacuum aspiration¹¹.

CONCLUSION

Manual vacuum aspiration is effective and safe method for management of first trimester pregnancy losses as compared to EVA. MVA is economical, easy

to use and does not need electricity and general anesthesia for its working.. MVA is safe and feasible particularly in low resource settings and can be preferred over EVA for management of first trimester miscarriages. This preference is based on the results which show similar efficacy, less blood loss and shorter duration of hospital stay with MVA.

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