

Comparative study of dilatation and curettage, manual and electric vacuum aspiration as methods of treatment of early abortion in Beni Suef, Egypt

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ABSTRACT

The aim of this study is to compare electric vacuum aspiration (EVA), manual vacuum aspiration (MVA) and uterine curettage (D&C) for first trimester abortions, in terms of the efficiency of eliminating ovular remnants, frequency of complications, duration of the procedure, and duration of patients' hospitalization. In a prospective study, 50 patients in EVA group, 50 patients in the MVA group and 50 in the D&C group were randomly included. Inclusion criteria were: spontaneous abortion, gestational age less than 12 weeks, patent cervix, endometrial thickness >15 mm, afebrile state, and hemoglobin >9 g/dl. Blood samples were collected before and after surgical procedures for control of hemoglobin levels. Anesthesia was performed in all cases. The time required for each surgical procedure was recorded. Groups were similar regarding gestational age and endometrial thickness before surgery. Durations of the procedure and of hospitalization were significantly shorter in the EVA and MVA group compared to the D&C group. EVA group showed the least incidence of complications regarding the amount of blood loss, uterine perforation and cervical laceration. Regarding the incomplete evacuation, both the EVA and MVA groups showed the same results. EVA caused less blood loss, was less time consuming, and resulted in shorter hospitalization.

Keywords: Abortion, electric vacuum aspirations, manual vacuum aspiration, dilatation and curettage.

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INTRODUCTION

Pregnancy is often defined as beginning when the developing embryo becomes implanted in the endometrial lining of the women's uterus. Most pregnant women do not have any specific signs of implantation. After implantation, the uterine endometrium is called decidua. The placenta is formed partly from decidua and partly from outer layers of the embryo (Geimes et al., 2006).

Abortion is the termination of pregnancy by expulsion of an embryo from the uterus prior to viability (Knudsen, 2006). Some studies suggested that 20% of all pregnancies worldwide end in abortion (Say et al., 2005). Nearly half of these abortions are unsafe and often illegal (Knudsen, 2006). We can classify abortion clinically into different types as follows: Incomplete abortion, if bleeding has begun and the cervix is dilated but the tissue from

pregnancy still in the uterus (Blum et al., 2007). Inevitable abortion, a condition of pregnancy in which spontaneous termination is imminent and cannot be prevented; it is characterized by bleeding, uterine cramping, dilatation of the cervix and presentation of the conceptus in the cervical os. Missed abortion, is a common complication of early pregnancy occurring in up to 15% of all clinically recognized pregnancies (Nielsen and Hahlin, 1995).

Surgical abortions can be performed by different methods including manual vacuum aspiration (MVA) or electric vacuum aspiration (EVA), dilatation and curettage (D&C). These methods are all safe and effective (Wen et al., 2008).

The vast majority of abortions in medical institutions in Beni Suef are performed in the first trimester. If less than 12 weeks have passed since the last menstrual period,

Table 1. Age (y) and parity in all groups.

Group	Parameter	n	Minimum	Maximum	Mean	SD
D&C	Age (y)	50	17	45	29.1	7.0
	Parity	50	1	3	2.2	0.7
EVA	Age (y)	50	17	46	28.4	8.9
	Parity	50	1	4	2.2	1.0
MVA	Age (y)	50	22	45	31.1	6.6
	Parity	50	1	4	2.2	0.9

SD: Standard deviation; NS: Non-significant (P-value > 0.05); S: Significant (P-value < 0.05); HS: Highly significant (P-value < 0.01).

then it is first trimester. The most common method for the first trimester surgical abortion is vacuum aspiration or suction curettage. Vacuum uterine aspiration allows for the simple evacuation of the uterus through a cannula attached to either an electric or manual vacuum source (Dalton et al., 2006).

Although the success rate of medical abortion using modern regimens of Mifepristone and Misoprostol typically exceeds 95%, aspiration is sometimes necessary for management of continuing pregnancy, a persistent gestational sac or heavy prolonged bleeding. MVA offers an alternative to either D&C or EVA in management of these situations (Fawcus et al., 1997).

PATIENTS AND METHODS

This study included 150 women with clinical diagnosis of first trimester abortion or an embryonic pregnancy were recruited. Their ages were ranging from 17 to 45 years with a mean age of 29.1 years. Cases were referred to the Obstetrics and Gynecology Department of Beni Suef General Hospital and Faculty of Medicine, Beni Suef University, and also managed in these hospitals in the period between 2010 and 2012.

Study group

The study group was categorized according to their course of management into three groups:

- Group 1: Cases treated with D&C.
- Group 2: Cases treated with EVA (electric vacuum aspiration).
- Group 3: Cases treated with MVA (manual vacuum aspiration).

Clinical history

A thorough history was taken for each patient, focusing on:

- i) Menstrual history.
- ii) Contraceptive and hormonal intake history.
- iii) Previous history of abortion and its management.

Clinical examination and investigations

A detailed pelvic scan, complete blood count CBC, blood grouping

and urine analysis were done for all cases of the study group:

- i) Studies included the head to head comparison of MVA, EVA and D&C.
- ii) The outcome data were analyzed regarding: complete abortion, the occurrence of uterine perforation, cervical laceration, bleeding and uterine remnant.
- iii) Secondary recurrent evacuation, anesthesia, cost, duration of hospitalization and the procedures.

Statistical analysis

The statistical analysis of the data was done by using Excel program and SPSS program (statistical package for social sciences version 10) on Windows XP. The description of the data was done in form of mean \pm SD for quantitative data and frequency and proportion for qualitative data. The analysis of the data was done to find statistical significant difference between groups for quantitative data (mean \pm SD). Student t-test was used to compare between two groups. One way ANOVA was used to compare more than 2 groups. Correlations were done to test for linear relations between variables. Interpretation of P-values was as follows: < 0.05 is considered significant, < 0.001 is considered very highly significant.

RESULTS

The data obtained in Table 1 and 2 and Figure 1 and 2, showed the number of cases, their ages and parity state in each group of our study. There was no significant difference (P > 0.05) in age and parity between the study groups.

In Table 3 and Figure 3, we found that the incidence of uterine perforation was highest in D&C group representing 5 cases (10%) while only one case (2%) in MVA group. No reported cases of uterine perforation were detected in the EVA group. The P-value regarding the uterine perforation was 0.026 (significant).

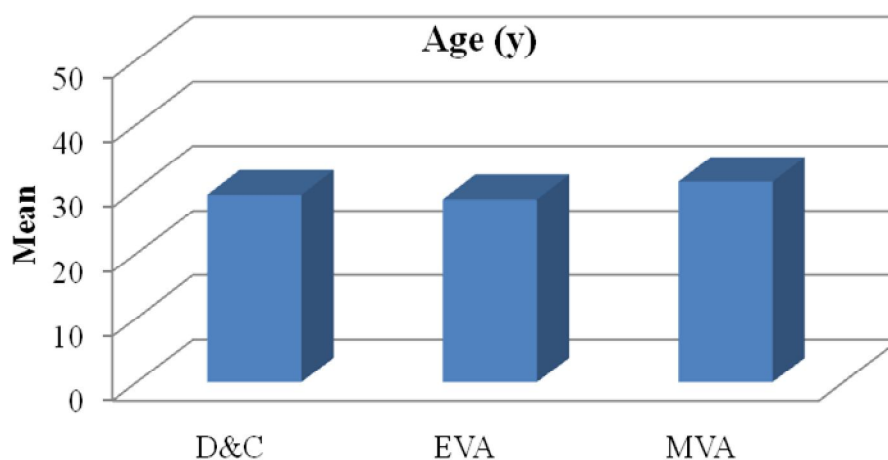
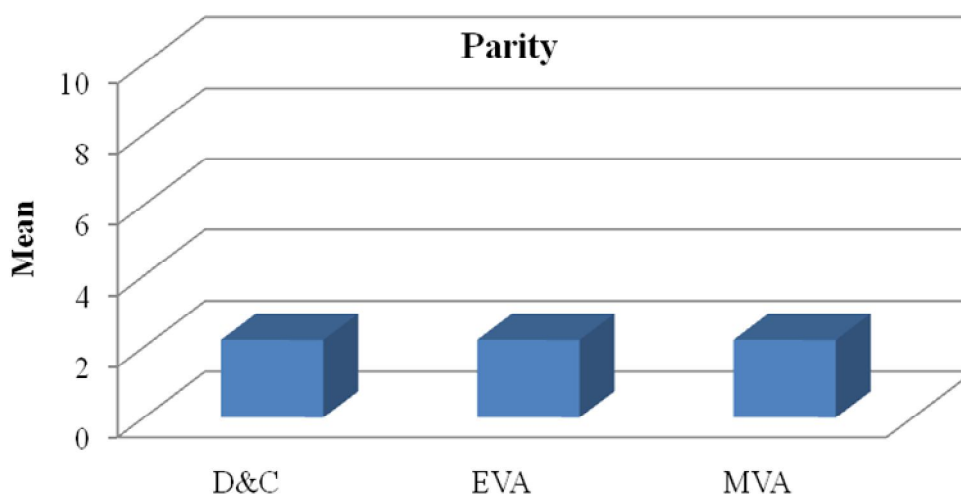
We found that the incidence of cervical laceration in D&C group was 10%, in MVA group was 4%, while it was only 2% in EVA group as shown in Table 4 and Figure 4.

In Table 5 and Figure 5, the number cases showing post procedure bleeding in D&C group was 9 (18%), in EVA group was 2 (4%) and 3 (6%) cases in MVA group. The

Table 2. Comparison between all groups according to age (y) and parity.

Parameter	D&C (Mean \pm SD)	EVA (Mean \pm SD)	MVA (Mean \pm SD)	P-value	Sig.
Age (y)	29.1 \pm 7.0	28.4 \pm 8.9	31.1 \pm 6.6	0.175	NS
Parity	2.2 \pm 0.7	2.2 \pm 1.0	2.2 \pm 0.9	0.924	NS

Sig. = Significance.

**Figure 1.** Mean age of study groups.**Figure 2.** Mean parity among study groups.

P-value was significant (0.033). This means that again EVA showed the least incidence of bleeding among our study groups.

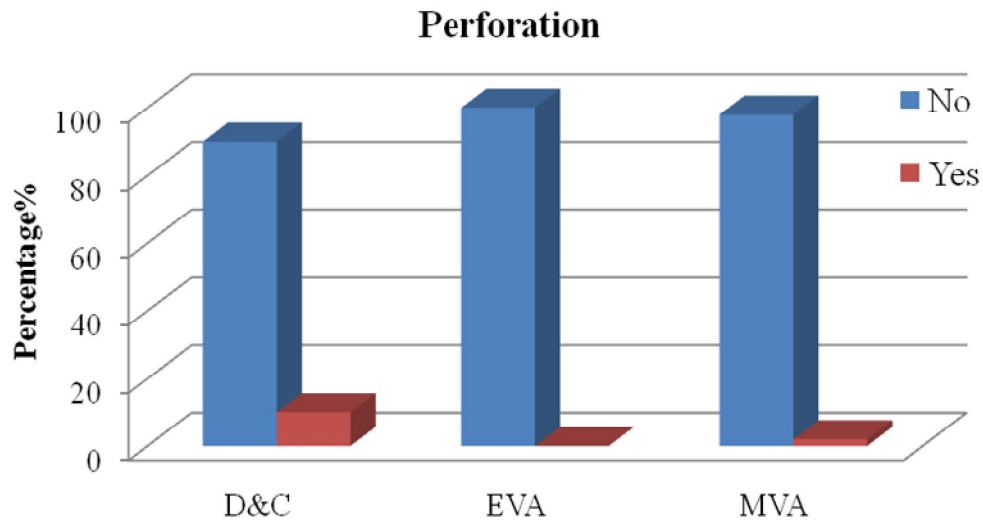
Regarding incomplete evacuation and recurrence rate; we found that their incidence in D&C group was 10(20%), in MVA group was 4(8%) and only one case (2%) in EVA group as shown in Table 6 and Figure 6.

The duration of surgery was shorter with EVA group compared to MVA and D&C groups and was statistically significant (P-value = 0.001) (Table 7 and Figure 7).

There were statistically significant difference as regards the duration of hospitalization with P-value = 0.001. EVA cases group needed the least duration for hospital stay, followed by MVA group while D&C group showed the

Table 3. Comparison between all groups according to perforation.

Parameter		D&C No. (%)	EVA No. (%)	MVA No. (%)	P-value	Sig.
Perforation	No	45 (90)	50 (100)	49 (98)	0.026	S
	Yes	5 (10)	0 (0)	1 (2)		

**Figure 3.** Comparison between all groups regarding the occurrence of perforation.**Table 4.** Comparison between all groups according to cervical laceration.

Parameter		D&C No. (%)	EVA No. (%)	MVA No. (%)	P-value	Sig.
Cervical laceration	No	45 (90)	49 (98)	48 (96)	0.182	NS
	Yes	5 (10)	1 (2)	2 (4)		

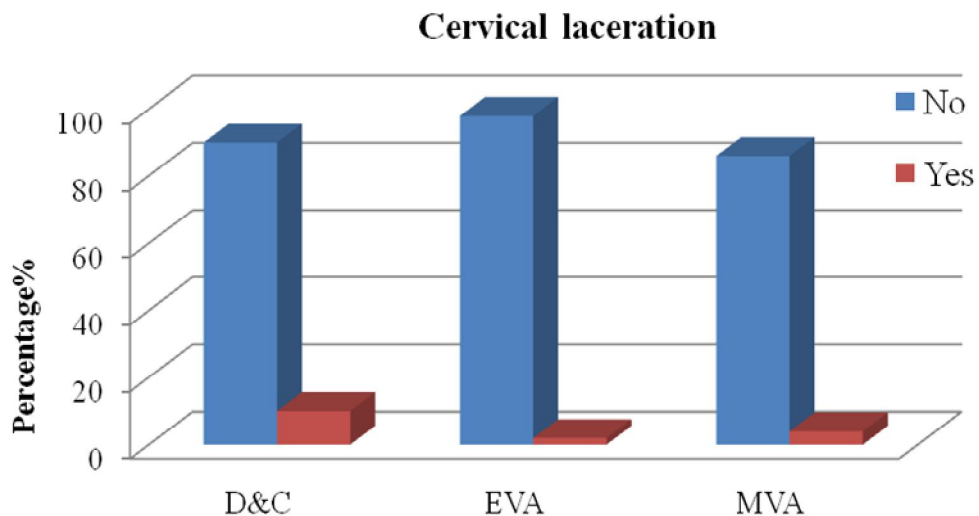
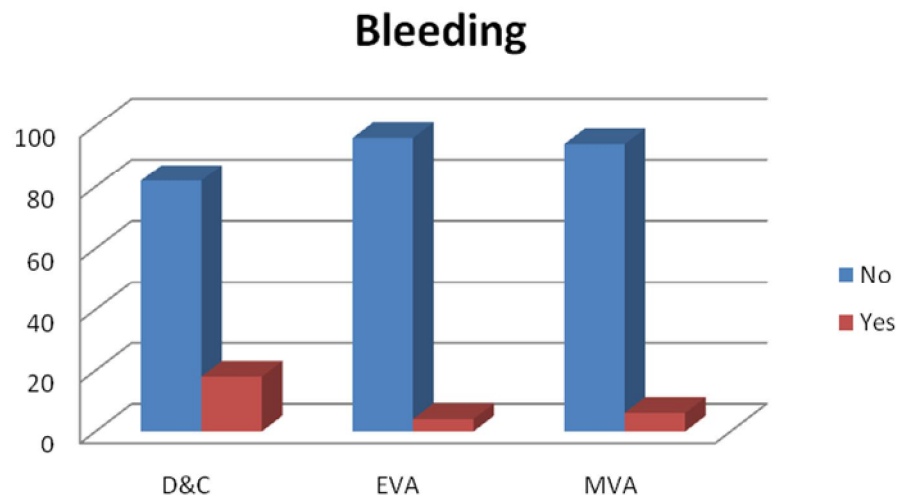
**Figure 4.** Percentage of cervical laceration of the study groups.

Table 5. Comparison between all groups according to bleeding.

Parameter		D&C No. (%)	EVA No. (%)	MVA No. (%)	P-value	Sig.
Bleeding	No	41 (82)	48 (96)	47 (94)	0.033	S
	Yes	9 (18)	2 (4)	3 (6)		

**Figure 5.** The incidence of bleeding between the groups.**Table 6.** Comparison between all groups according to the incidence of incomplete evacuation and recurrence rate.

Parameter		D&C No. (%)	EVA No. (%)	MVA No. (%)	P-value	Sig.
Incomplete evacuation and recurrence rate	No	40 (80)	49 (98)	46 (92)	0.010	S
	Yes	10 (20)	1 (2)	4 (8)		

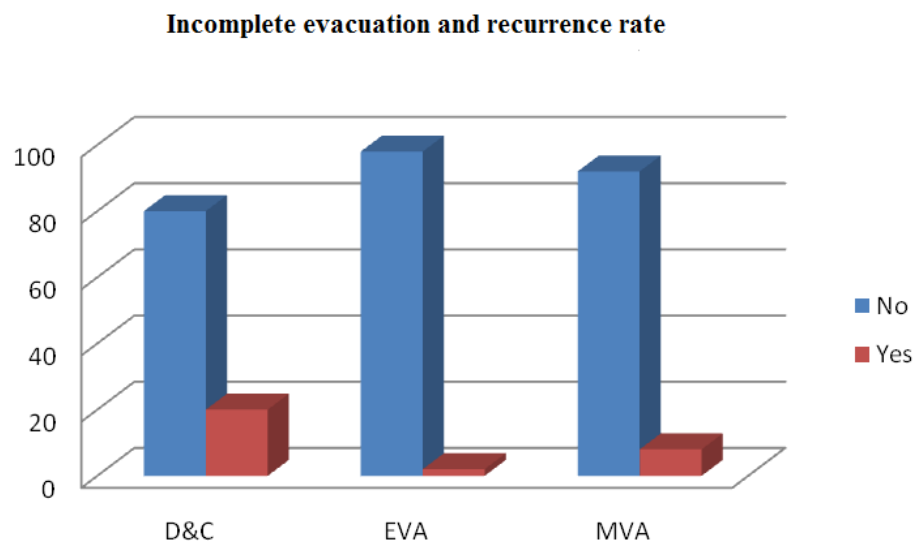
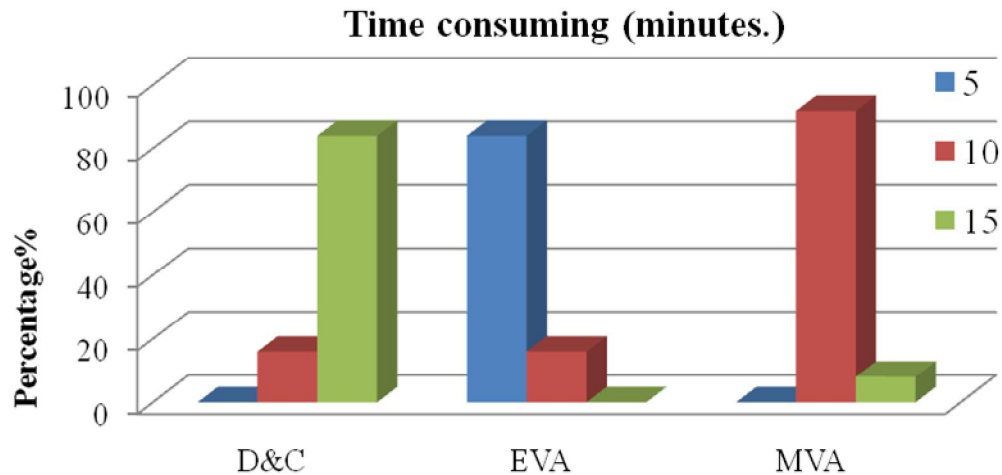
**Figures 6.** The percentage of incomplete evacuation and the recurrence rate.

Table 7. Comparison between all groups according to time consuming (minutes).

Parameter		D&C No. (%)	EVA No. (%)	MVA No. (%)	P-value	Sig.
Time consuming (minutes)	5	0 (0)	42 (84)	0 (0)	0.001	HS
	10	8 (16)	8 (16)	46 (92)		
	15	42 (84)	0 (0)	4 (8)		

**Figure 7.** Comparison between all groups according to the duration of the procedure.

highest duration of hospital stay (Table 8 and Figure 8).

DISCUSSION

Dilatation and curettage, electric vacuum aspiration and manual vacuum aspiration are all safe and effective for first-trimester termination of pregnancy (Wen et al., 2008). Electric vacuum aspiration needs less time to perform than dilatation and curettage. Manual vacuum aspiration involves greater procedural difficulty compared with electric vacuum aspiration in cases of late terminations (Wen et al., 2008).

An important characteristic of these methods is operation time. EVA took less time than MVA and D&C. Besides this, physicians perceived that EVA was easier to perform, which might account for the reports that EVA was more commonly used than MVA in the USA and other industrialized countries (Gan et al., 2001; Bird et al., 2001; Gazvani et al., 2004).

In our study, we found that both EVA and MVA showed less blood loss, were less time consuming, and resulted in shorter hospitalization as compared with the D&C. This was consistent with the results of the prior studies (Gan et al., 2001; Bird et al., 2001; Gazvani et al., 2004). However, both EVA and MVA were found to be efficient for treatment of incomplete abortions during the first trimester of pregnancy, with little complications after both

treatments (Pereira et al., 2006).

Different studies showed no reports of maternal deaths or cases of uterine perforation. There were no statistically significant differences for excessive blood loss, blood transfusion, febrile morbidity, incomplete or repeat uterine evacuation procedure, re-hospitalization, post operative abdominal pain or therapeutic antibiotic use (Yin, 2005).

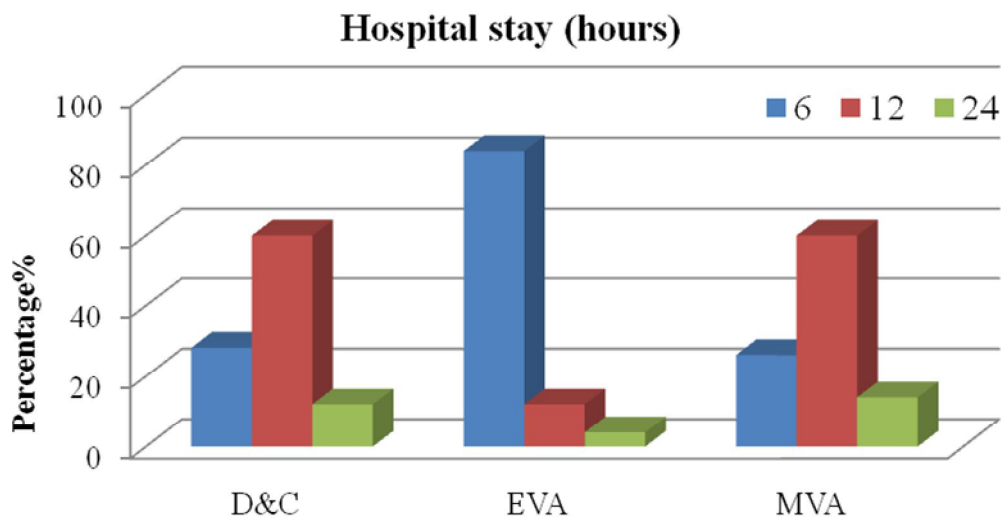
Regarding the duration of operation (Yin, 2005), it was statistically significantly shorter with vacuum aspiration compared to D&C. Flexible versus rigid vacuum aspiration cannula: There were no statistically significant differences with regard to cervical injuries, febrile morbidity, blood transfusion, therapeutic antibiotic use, or incomplete or repeat uterine evacuation procedure (Yin, 2005).

Regarding our study groups, we found that there were statistically significant differences regarding the occurrence of bleeding, post procedure perforation, the incomplete evacuation and recurrence rate, the duration of procedure and the duration of hospitalization with the EVA group showing the least incidence of the previously documented complications, shorter durations of both procedure and hospital stay. On the other hand, there were no statistically significant differences as regards the cervical laceration.

MVA and EVA seem to be very similar regarding effectiveness in achieving complete evacuation. One trial found more frequent uterine perforations with EVA, while

Table 8. Comparison between all groups according to hospital stay (hours).

Parameter		D&C No. (%)	EVA No. (%)	MVA No. (%)	P-value	Sig.
Hospital stay (hours)	6	14 (28)	42 (84)	13 (26)	0.001	HS
	12	30 (60)	6 (12)	30 (60)		
	24	6 (12)	2 (4)	7 (14)		

**Figure 8.** Comparison between all groups according to the duration of hospital stay.

another found no difference. The second trial was consistent with our study (Wen et al., 2008).

Regarding blood loss, MVA is superior to EVA among women with less than 50 days of gestational age (Wen et al., 2008). While in our study, we found that EVA was superior to the MVA regarding the occurrence of blood loss.

Major complications seemed to be rare with EVA and MVA methods as compared with the D&C method. The main findings in different studies were that there were no statistically significant differences, comparing MVA with EVA, in complete abortion rate. EVA seems superior to MVA regarding operation time and physicians' assessment (Bird et al., 2003).

In two trials with 467 women comparing D&C and EVA methods, there were no statistically significant differences in increased blood loss, blood transfusion, febrile morbidity, repeat evacuation, re-hospitalization, postoperative pain or therapeutic antibiotic use between the two groups (WHO, 2007). This was not the case in our study as we reported statistically significant differences in both groups regarding the blood loss (Kulier et al., 2001). However, the duration of surgery was shorter with EVA compared to D&C in both early and late abortions and was statistically significant and this agree with our results.

We concluded that dilatation and curettage, electric vacuum aspiration and manual vacuum aspiration are all safe and effective for first-trimester termination of pregnancy. Electric vacuum aspiration needs less time to perform than dilatation and curettage. Manual vacuum aspiration is associated with less pain than electric vacuum aspiration in cases of early terminations, but manual vacuum aspiration involves greater procedural difficulty compared with electric vacuum aspiration in our cases.

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