



Original Article

Manual vacuum aspiration and electrical vacuum aspiration-A comparative study for first trimester MTP

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Abstract

Objectives: The present study compares MVA and EVA as the method for 1st trimester MTP in terms of efficacy, blood loss, duration, acceptability and complications. **Method:** The present study was conducted in the Department of Gynecology and Obstetrics, Eden Hospital, Medical College, Kolkata. Medical College, Kolkata is also a Government of India recognized center for MVA training programme. A total number of 200 patients were studied; out of which 100 patients underwent MVA and remaining 100 EVA. Cases were compared with respect to age, parity, blood loss, time taken and complications. **Results :** In the present study MVA was effective in 98% and EVA in 97% cases as 2% and 3% respectively of the 2 groups required reevacuation for incompleteness. Thus the two procedures did not show much difference as far as their effectiveness was concerned. **Conclusion :** MVA has a safety and efficacy profile similar to that of EVA. Also, MVA is a simple, safe, effective procedure, portable and low cost technique. Hence, MVA is a promising method compared to EVA which can be practiced widely in rural areas where the access to medical facilities are limited, high tech equipments are not available, power supply erratic and maintenance of instruments not up to the mark. The judicious use of MVA comes with a promise to make early abortions safe and easily accessible to women of both rural and urban societies belonging to any socioeconomic strata.

Key words : Manual Vacuum Aspiration, Electrical vacuum aspiration, abortion

The World Health Organization (WHO) estimates that 46 million pregnancies end in abortion each year, and nearly 20 million of those are thought to be unsafe (WHO, 2003). An estimated 67,000 women die each year from unsafe abortions, and hundreds of thousands more women suffer serious injuries and disabilities

(WHO, 2003). About 13% of maternal deaths are due to unsafe abortions.¹ Unsafe abortions are a serious public health problem in India. In fact, unsafe abortion is one of the leading causes of maternal mortality in India. The number of abortions is steadily rising each year. The number of deaths due to unsafe abortions has also been steadily increasing.

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Out of all the recognized procedures of first trimester MTP, Electrical Vacuum Aspiration (EVA) has been used since years. Vacuum aspiration has become standard surgical procedure for safe early pregnancy termination. Most of these operations are performed in operating theatre using suction curettage and an electric vacuum. Manual vacuum aspiration (MVA) is an alternative that is well suited for use as a clinical procedure,

which could have advantages both for the patient and health care system. The present study compares MVA and EVA as the method for 1st trimester MTP in terms of efficacy, blood loss, duration, acceptability and complications.

Methods

The study was conducted in the Department of Gynecology and Obstetrics, Eden Hospital, Medical College, Kolkata, which is also a Government of India recognized center for MVA training programme. A total number of 200 patients were studied; out of which 100 patients underwent MVA and remaining 100 EVA. The patients were selected randomly. Exclusion criteria included : i)Previous Caesarean delivery ii)Gestational age >12 weeks iii)Uterine fibroids iv)Suspected ectopic pregnancy v)Presence of pelvic infection vi)Bleeding disorders. Preliminary investigations done were hemoglobin estimation and blood grouping and Rh typing.

The procedure followed in MVA was:1)Patient counseling was done 2)Injection Diazepam 10mg with injection Pentazocine 30 mg was given intramuscularly at the beginning. 3) Vacuum was created in 60mL double valve MVA syringe i.e. the syringe was charged.4)The uterus was re-evaluated by bimanual examination.5)The size of the cannula was selected (varying from 4mm-12mm) to snugly fit in the cervical canal.6)Using no touch technique, the cannula was inserted through the cervix towards the fundus.7)The charged syringe was attached to the cannula and the pinch valves released allowing the vacuum to get transferred to the uterine cavity.8)Contents of the uterus were evacuated by using rotatory or back and forth movements of the canula.9)Appearance of red-pink foam or bubbles, absence of more products getting aspirated, a gritty sensation as the cannula passes over the uterine walls, and a feel of the uterus contracting around the cannula were considered as signs of completeness of the procedure.10)The evacuated material was inspected for chorionic villi and also the amount of blood loss & total time taken estimated. The procedure followed in EVA was:1)The patient was counseled 2)Injection Diazepam 10mg with injection Pentazocine 30mg was given intramuscularly at the beginning. 3)The uterus was re-evaluated by bimanual examination. 4)Various parts of aspiration apparatus were connected in a way that they form a continuous system : i.e. one plastic pipe was connected from flask to the electric pump and another was connected from flask to the aspiration can-

nula.5)The electric pump was set in action and the vacuum was read on the pressure gauge.6)The negative pressure was set in the range of 0.4-0.8 kg/m². 7)Cervical dilatation done in almost all cases. 8)Aspiration cannula chosen and passed gently through the cervical canal and into the endometrial cavity.9)The system was started and in few minutes the products of conception were aspirated into the aspiration flask.10)The cannula was turned around 180 degree on its longitudinal axis and to and fro movement. It was taken out once or twice, allowing the aspirated air to compress the material through the connecting pipes into the aspirated flask.11)Signs of completion are similar as in manual vacuum aspiration.12)Amount of blood loss was estimated and the evacuated material inspected for chorionic villi.

Patients were discharged after 4 hours of observation, after advising oral antibiotics and analgesic. Those who underwent laparoscopic ligation with MVA/EVA were also discharged after 4 hours. But those who underwent minilap ligation along with MVA/EVA were discharged after 24 hours. All the patients were asked to come for follow up after 1 week and again after 6 weeks (as by then she is expected to have resumption of menstruation). All of them were given family planning advice.

Result and analysis

Table 1 shows that majority of the patients is both study

Table 1:

Distribution of study subjects according to age & parity.

Age (years)	MVA	EVA
<20	12	9
20 -30	60	61
30 -40	28	30
>40	-	-
Total	100	100
Parity	MVA	EVA
Nulliparous	10	9
Multiparous	90	91
Total	100	100

Table 2:

Distribution of study subjects	
Procedure	Number of patients
MVA	100
EVA	100
Total	200

groups were in the age group of 20-30 years. Multiparous women constituted maximum number of patients in both the study groups. From Table 2 it is seen that of the total 200 patients under study, 100 patients each were randomly assigned to undergo MVA or EVA. Table 3 reflects that the median gestational age was 10 weeks for both procedures. Mean time taken in each group was calculated and compared. The student t - value and p value for 6-8 weeks gestational age were 0.55 and 0.587 respectively; for 8-10 weeks gestational age were 1.50 and 0.136 respectively; and for 10-12 weeks age were 0.36 and 0.722 respectively. Hence, statistically the values are insignificant, thus implying that there is no advantage of MVA over EVA in time taken for performing either procedures. Table 4 gives an idea about the volume of blood loss associated with either procedures. Blood loss is more for gestational age over 10 weeks in both procedures and apparently more in those who underwent EVA. But the p value is 0.737 which is statistically insignificant. Hence, there is no significant difference of blood loss in either procedure. In Table 5 we see that the complications during the procedure were rare except for an excess bleeding noted in one patient who underwent EVA. Lower abdominal pain the common complaint, noted in both procedures followed by excess bleeding were found more in association with those who had Cu-T insertion. Incomplete evacuation was noted in both procedures for which re-exploration and evacuation had to be done. 2% of MVA and 3% of EVA had incomplete evacuation (p value 1.00 is statistically insignificant). In the present study MVA was effective in 98% and EVA in 97% cases as 2% and 3% respectively of the 2 groups required reevacuation for incompleteness. Thus the two procedures did not show much difference as far as their effectiveness was concerned.

Discussion :

Vacuum devices, first described in medical literature in

the 1800s, allowed the development of suction aspiration methods of abortion. The invention of the Karman cannula, a flexible plastic cannula which replaced earlier metal models in the 1970s, reduced the occurrence of perforation and made suction aspiration methods possible under local anesthesia. The 1970s also witnessed the legalization of Medical Termination of Pregnancy (MTP) in India by the MTP Act which was passed on 10th August, 1971 and came into force from 1972.

All the women in our study were in the 1st trimester. Maximum number were of the gestational age range 10-12 weeks, median gestational age being 10 weeks for both the procedures. In the retrospective Cohort analysis of Goldberg et al¹² all the women undergoing either EVA or MVA were upto 10 weeks gestational age. Westfall³ studied MVA on 1677 patients where majority were upto 10 weeks gestation with only 10 patients i.e. 0.6% between 10-12 weeks. Hemlin and Moller⁴ studied MVA in patients with gestational age <56 days i.e. upto eight weeks. Bird et al⁵ did a comparative study of acceptability of MVA and EVA on 42 women all <77 days gestation i.e. <11 weeks.

Though it may apparently appear from Table 4 that the blood loss was more in the EVA group yet the p-value is 0.737 which is statistically insignificant. Similar observations Goldberg et al⁶ who found that although blood loss was apparently lower with MVA, the difference between estimated blood loss of 35 ml and 42 ml

Table 3:

Distribution of study subjects according to gestational age (weeks) and time taken (minutes).

Procedure	Gestational age (weeks)	Number	Time taken (mins)
EVA	6-8	8	7.1
	8-10	44	9.2
	10-12	18	10.5
MVA	6-8	10	6.8
	8-10	41	8.4
	10-12	20	10.3

Table 4:**Distribution of study subjects according to gestational age (GA) and blood loss (ml).**

Procedure	GA (week)	<60ml	>60ml
EVA	6-8 (n=8)	8	-
	8-10 (n=44)	44	-
	10-12 (n=48)	18	30
MVA	6-8 (n=10)	10	-
	8-10 (n=41)	41	-
	10-12 (n=49)	20	29

Table 5:**Distribution of study subjects according to complications .**

Complications	MVA	EVA
I. During procedure		
a) Excess bleeding	-	1
b) Uterine perforation	-	-
c) Cervical injury	-	-
II During follow up		
a) Pain abdomen	7	9
b) Excess Bleeding	5	3
c) Incomplete evacuation	2	3
Total	14	16

was not clinically important and both procedures were associated with very low blood loss i.e. 35.4 ± 16.8 ml and 41.6 ± 18.2 ml. However their P-value was $<.001$ which was statistically significant. The two procedures did not show much difference as far as their effectiveness was concerned (98% in MVA and 97% in EVA). Similar studies done elsewhere show the same results for MVA. Paul et al,⁷ 2002, showed 98% efficacy for MVA, Hemlin & Moller⁸ 2001 showed it to be 98%. Goldberg et al⁶ found MVA to be effective in 97.8% and EVA in 98.3% cases (p-value 0.43). Westfall³ found MVA to be effective in 99.6% cases.

Abortions still constitute a significant proportion of the cause of maternal mortality and morbidity. A safe, ef-

fective procedure for procuring medical termination of pregnancy is highly needed in this scenario. Both manual vacuum aspiration and electrical vacuum aspiration are established safe and effective surgical methods of 1st trimester MTP.

The manual aspiration equipment is inexpensive its simplicity of use and the proof that MVA has a safety and efficacy profile similar to that of EVA, could increase the number of physicians who offered abortions to their patients. Another important aspect is that MVA is a simple, safe effective procedure. Its portability and low cost make it a technique best suited for the infrastructure in rural areas. MVA is a promising method compared to EVA which can be practiced widely in rural areas where the access to medical facilities are limited, high tech equipments are not available, power supply erratic and maintenance of instruments not up to the mark. The judicious use of MVA comes with a promise to make early abortions safe and easily accessible to women of both rural and urban societies belonging to any socioeconomic strata.

References

- 1 World Health Organization (WHO). Safe Abortion: Technical & policy guidance for health system. Geneva. WHO; 2003 :10-17
- 2 Goldberg AB, Dean G, Kang Mi – Suk, et al Manual versus electric vacuum aspiration for early first trimester abortion: A controlled study of complication rates. *Obstetrics and gynecology* 2004 ;103:101 – 7.
- 3 Westfall JM, Sophocles A, Buggraf H, et al. Manual vacuum aspiration for first trimester abortion. *Arch Fam Med*;1998;7 :559 – 62
- 4) Hemlin J, Moller B. Manual vacuum aspiration, a safe and effective alternative in early pregnancy termination. *ACTA Obstet Gynecol Scand* ;2001 ;80;563 – 7
- 5 Bird ST, Harvey SM, Nichols M, et al. Comparing the acceptability of manual vacuum aspiration & electrical vacuum aspiration as methods of early abortion. *J Am Med Womens Assoc.*2001 Summer;56;124 - 6
- 6 Goldberg AB, Dean G, Kang Mi – Suk, et al. Manual versus electric vacuum aspiration for early first trimester abortion: A controlled study of complication rates. *Obstetrics and gynecology* 2004; 103:101 – 7.
- 7 Paul M E et al. Early surgical abortion: Efficacy and safety. *Am J obstetrics and gynecology* 2002;187 :407- 11
- 8 Hemlin J, Moller B. Manual vacuum aspiration, a safe and effective alternative in early pregnancy termination. *ACTA Obstet Gynecol Scand* ;2001 Jun ;80(6);563 – 7