

Original Research Article

# Compare the manual vacuum aspiration with electrical vacuum aspiration in 1<sup>st</sup> trimester MTP

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## Abstract

**Introduction:** During the last three decades, abortion laws have been liberalized in many parts of the world, so that termination of pregnancy is now permitted on broadly interpreted medical, psychological or social grounds.

**Aim:** Randomised study was undertaken to compare the manual vacuum aspiration with electrical vacuum aspiration in 1<sup>st</sup> trimester MTP.

**Materials and methods:** The study consisted of 100 pregnant women for termination of pregnancies in 1<sup>st</sup> trimester (6-12 weeks) admitted, during period of 2 years this study was carried out by using manual vacuum aspiration syringe in 50 women who formed the study group and compared with electrical vacuum aspiration in 50 women who formed the control group.

**Results:** Majority of the patients belongs to age group between 21-25 years, Most of them were married and multigravidae requesting MTP, Longer the average procedural time observed with electrical vacuum aspiration (8.1 min) than manual vacuum aspiration (7.6 min). Average amount of blood loss compared with gestational age in both the procedure there is excessive amount of blood loss with increasing gestational age and blood loss is comparatively more with electrical vacuum aspiration (21.6 ml) than manual vacuum aspiration (16.6 ml). There are no complications during procedure with both vacuum sources. Incomplete evacuation rate with MVA was 4% and with electrical vacuum aspiration 2%. In the follow up after 1 month complications are nil with both the procedures.

**Conclusions:** MVA procedure leads to marked improvement in the quality of abortion care, being its low maintenance, relatively inexpensive and easily transportable instrument, with eliminating need for electricity with these features combined with success in first trimester pregnancy termination.

## Key words

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Manual vacuum aspiration, Electrical vacuum aspiration, MTP, 1<sup>st</sup> trimester.

## Introduction

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During the last three decades, abortion laws have been liberalized in many parts of the world, so that termination of pregnancy is now permitted on broadly interpreted medical, psychological or social grounds. The most important reason for the trend towards the liberalization of abortion laws has been the belief that this measure will result in reduction in mortality due to illegal septic abortion. Despite a liberal abortion law, India experiences an estimated 4 million unsafe abortion per years, representing over half the total number of abortions annually.

With liberalization of abortion, women are coming in large no. to get pregnancy termination. Abortion has earned much popularity in the last decade because of its greater safety and large impact on population control. Most abortions done today, fall in this category. Induced abortions may be legal (MTP) or illegal (septic). Worldwide abortions rate of 37 to 55/1000 women aged 15 to 44 years. Indian Council of Medical Research Studies (ICMR) reveal that the extent of illegal abortions was 13.5/1000 in comparison with legal abortions 6.1/1000 abortions are observed to be maximum in the age group of 20-24 years. Abortions rate in teenagers in the west is 15-20% and in India is 6% [1].

In circumstances where abortion is not against the law health systems should train and equip health –service providers and should take other measures to ensure that such abortion is safe and accessible.

- The conditions under which the pregnancy can be terminated.
- The persons who can perform such terminations.
- The places where such terminated can be performed.

The conditions under which the pregnancy can be terminated:

- a) **Medical grounds:** Where the conditions of pregnancy might, endanger the life of the pregnant women. Cause grave injury to her physical and mental health.
- b) **Eugenic ground:** Where there is substantial risk of child being born with serious handicaps due to physical (or) mental abnormalities.
- c) **Humanitarian grounds:** Where pregnancy is caused by rape.
- d) **Social grounds:** The actual or reasonably foreseeable environment (social (or) economical) might lead to risk or injury to health of the mother. There has been a failure of contraceptive devices or methods.

The last ground (contraceptive failures) is a unique feature of Indian law, virtually allowing abortion on request as it is difficult to prove that pregnancy was not caused by failure of contraception. The written consent of the guardian is necessary before performing abortion in women under 18 years of age and in lunatics even if they are older than 18 years. Pregnancy can only be terminated with the written consent of women. Husbands consent when available should always be taken but it is not absolutely essential.

The act provides safeguards to the mother by authorising only a qualified registered medical practitioner, having gynaecological and obstetrical experience either a degree (or) diploma (or) a registered medical practitioner who has assisted in at least 25 MTP'S in a recognised center with a certificate (or) a experience of 6 months house surgeoncy in obstetrics and gynecology department, however, when pregnancy is beyond 12 weeks, the opinion of two registered medical practitioners are necessary to terminate the pregnancy legally no pregnancy should be terminated beyond 20 weeks. The act stipulates that no termination of

pregnancy shall be performed at any place other than A hospital established and maintained by the government. Hospitals, nursing homes registered and approved for the purpose under the MTP act of the government. Abortions service a provided at these centers under the strict confidence. The name of the patient is kept confidential since abortion has been treated as a statutory personal matter. There are 161 recognised training centers for MTP. Only 1/3 rd trained doctors are working in PHC'S. A crash training programme for PHC doctors under MTP is being implemented. After successful performance of 25 abortions. Under supervision, practitioner is licensed to perform on his own [2].

Among various methods of all first trimester MTP procedures MVA (manual vacuum aspiration) is the best because of its simplicity easily transportable inexpensive, no need of electricity and decrease the need of manpower to handle electric pump. MVA kits contains either single or double valve syringes and karman cannulae. In both the single and double valve syringe the syringe serves as the source of vacuum to pull the contents of the uterus through the canula into the barrel of the syringe. The study is aimed at evaluating the efficacy of manual vacuum aspiration procedure in the termination of 1<sup>st</sup> trimester pregnancy in comparison with electrical vacuum aspiration procedure.

### **Materials and methods**

The study consists of 100 pregnant women for termination of pregnancies in 1 st trimester (6-12 weeks) admitted to the depth of Obstetrics and Gynecology and family welfare centre, Gandhi Hospital, Secunderabad, Telangana during the year 2000-2001. This study was carried out by using manual vacuum aspiration syringe in 50 women who formed the study group and compared with electrical vacuum aspiration in 50 women who formed the control group.

### **Inclusion criteria**

- Confirmed gestational age of 6-12 weeks are taken,
- Patient with previous caesarean section,
- Hb > 10 gm%.

### **Exclusion criteria**

- The women with Hb < 10 gm%,
- Febrile and who are having pelvic infection.

A gynaecological examination was done and period of gestation was studied. All pregnant women were subjected to investigations like blood group and typing HB%. A through medical and obstetric history is taken. A detailed general examination was conducted and vital data recorded.

From among the patients who came to outpatient department requesting for MTP a random selection was done. A complete case record was prepared. A detailed history of all the patients was taken .general examination done in which patients vital signs (temp, PR, BP) checked general health of women noted. Systemic examination done in which respiratory and CVS systems examined abdomen palpated. Speculum examination done to check for cervical infection and sexually transmitted diseases.

Prior to pelvic examination explains the purpose of the examination to the patient. The women should empty her bladder and assume lithotomy position on an appropriate examination table .drape the patient to protect her privacy .the examination done wearing clean, undamaged examination gloves. With two fingers of one hand inserted in the vagina and other hand palpating abdomen, asses the size of the uterus consistency and position of the uterus. The external gentilea is gently cleaned .cervical and vaginal area was swabbed with water based ante septic solution using sponge forceps and cotton wool. Paracervical block was given using 1% xylocaine after giving test dose to relive pain of cervical dilation.

### Steps for MTP by manual vacuum aspiration syringe:

- **Step 1:** After speculum is inserted, hold the cervix steady with a tenaculum and gently apply traction to straighten the cervical canal.
- **Step 2:** Paracervical block is administered.
- **Step 3:** Cervix is dilated with cannulas of progressively increasing size, taking care not to traumatize the cervix.
- **Step 4:** Cannula is inserted gently through the cervix in to the UT cavity just past the internal Os. Rotating the cannula with gentle pressure.
- **Step 5:** Cannula is pushed slowly in to the uterine cavity until it touches the fundus. uterine depth is noted by the dots visible on the cannula. The dot nearest the tip of the cannula is 6 cm from the tip, and the other dots are at 1cm intervals. After measuring the uterine size the cannula is slightly withdrawn.
- **Step 6:** Prepared syringe is attached to the cannula, holding the end of the cannula is one hand and the syringe in the other.
- **Step 7:** The pinch valve in the syringe is released to transfer the vacuum through the cannula to the uterus bloody tissue and bubbles should begin to flow through the cannula in to the syringe.
- **Step 8:** Contents are evacuated by moving cannula gently and slowly back and front, rotating syringe.
- **Step 9:** The completion of the procedure is checked by feeling gritty sensation as the cannula passes over the surface of the evacuated uterus ( or)when pink or red foam is seen (or) no more tissue is seen in the cannula and when uterus contracts over the cannula syringe is detached and emptied into the container for inspection.
- **Step 10:** Tissues removed from the uterus are inspected for quantity and for presence of products of conception to judge its correspondence to the duration

of gestation and to assure complete evacuation of an intrauterine pregnancy.

The steps in this procedure are similar till step 5 after wards cannula attached to the machine and machine is started .when the vacuum is created. Now cannula moved back and front and by rotator movements .the end point of curettage will be uterine cry “. Again we have to follow step 9 and step 10. Taken vital signs while the patient is still on the treatment table. Allowed the patient to rest comfortably where her recovery can be monitored. Checked bleeding and vital signs before discharge. Patients were advised to report immediately if there was any complications like prolonged bleeding, persisting abdominal crampy pain, fever or chills, syncope (fainting). Routine follow up after 1 week to see for completion of MTP by ultrasound and after 1 month after she resumes her normal menstrual cycle.

### Results

The results are analysed according to the age, parity, gestational age and marital status in total 100 pregnant women who came to hospital requesting 1<sup>st</sup> trimester medical termination of pregnancy irrespective of the procedure which has been done manual vacuum aspiration or electrical vacuum aspiration. Then in this study average procedural time, amount of blood loss, incomplete evacuation rates, complications during procedure, complications during follow up period are compared in both manual vacuum aspiration and electrical vacuum aspiration.

Majority of our patients 62% belonged to 21-25 years age group. Most of the patients were multigravidae (G 3 or more) coming to hospital for MTP. Majority of patients in present study were 8-10 weeks. Most of the patients were married and multigravidae undergoing tubectomy after termination (**Table – 1**).

Average procedure time in relation to gestational age was more with electrical suction (8.1 m) than manual vacuum aspiration (7.6 m). The amount

of blood loss increases with increase in gestational age. The amount of average blood loss with MVA was 16.6 ml and with electrical vacuum aspiration is 21.6 ml (**Table – 2**).

**Table - 1:** Demographic distribution.

Age (Years)	MVA	Electrical suction
< 20 yrs	9(9%)	11(11%)
21-25	28(28%)	34(34%)
25-30	6(6%)	7(7%)
31-35	2(2%)	3(3%)
<b>Gravidity</b>		
Primigravidae	8(8%)	6(6%)
Gravid 2	2(2%)	2(2%)
Gravid 3 (or) more	40(40%)	42(42%)
<b>Week of gestational</b>		
6 -8 weeks	16(16%)	14(14%)
8-10 weeks	24(24%)	26(26%)
10-12 weeks	11(11%)	9(9%)
<b>Marital status</b>		
Married	42(42%)	45(45%)
Unmarried	6(6%)	4(4%)
Divorced /widow	2(2%)	2(2%)

**Table - 2:** Gestational age and average blood loss.

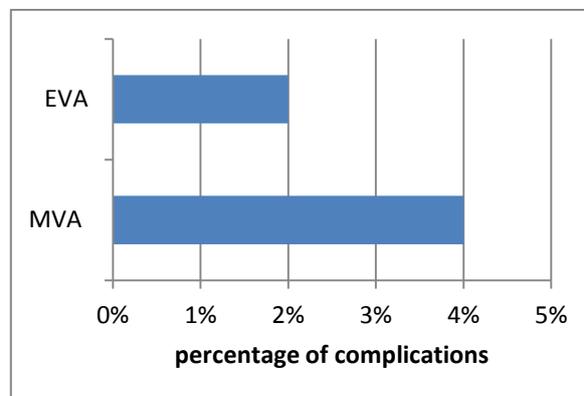
Gestational age	MVA	Electrical suction
6-8 weeks	4.67min	5.2 min
8-10 weeks	7.23min	7.8 min
10-12 weeks	11 min	11.5 min
<b>Average blood loss</b>		
6-8 weeks	10 ml	15 ml
8-10 weeks	15 ml	20 ml
10-12 weeks	25 ml	30 ml

In total 50 cases in which manual vacuum aspiration done 2 cases required D & C i.e. (incomplete evacuation rate 4%) where as in 50 cases in which electrical vacuum aspiration done 1 case required D & C i.e. (incomplete evacuation rate 2%) as per **Figure - 1**.

We did not encounter any complications during procedure with both vacuum sources. There was

no complication during follow up period .after 1 week and again after 1 month with both the procedure (**Table – 3**).

**Figure - 1:** Incomplete evacuation rate.



**Table - 3:** Complications during procedure.

Complications during procedure	MVA	Electrical vacuum aspiration
Anesthesia complication	Nil	Nil
Cervical laceration	Nil	Nil
Uterine perforation	Nil	Nil
Persistent bleeding p/v	Nil	Nil
Fever and chills	Nil	Nil

## Discussion

In circumstances where abortion is not against the law, health systems should train and equip health service providers and should take other measures to ensure that such abortion is safe and accessible.

There are so many methods of termination 1<sup>st</sup> trimester pregnancy, Medical methods and surgical methods. Medical methods like using prostaglandin's mifepristone. None of these products used alone have been found to be satisfactory and acceptable .with medical methods there is prolonged induction interval time, there is chances of incomplete abortion. Side effects like nausea, vomiting and gastro intestinal disturbances are present. In surgical methods we have suction evacuation and dilation and curettage. There are about 13 studies

comparing vacuum aspiration and sharp curettage where major complications reviewed. So vacuum aspiration is better than dilation and curettage in our study we compared manual aspiration to electrical vacuum aspiration. The average procedural time was less with MVA (7.6 min) than electrical vacuum aspiration (8.1 min).

While doing MTP procedure amount of blood loss depends on the gestational age .as gestational age increases blood loss with manual vacuum aspiration (16.6 ml) than electrical vacuum aspiration (12.6 ml). Incomplete evacuation rate with MVA is 4% where as with electrical vacuum aspiration it is 2%. Out of 50 cases in which MVA procedure was adopted, in 2 cases we needed second procedure like D & C to complete the procedure. These two cases were of about 10 -12 weeks size where we encountered the problem with dilatation. It is difficult to pass the karman's cannula of no .12 size with partially dilated cervix. So we abandoned the procedure and D & C was done. Out of 50 cases in which electrical suction was done in 1 case we needed second procedure like D & C in this case the uterine size is about 10-12 weeks and there is a difficulty in dilating the cervix.

In a study conducted at PIMS, 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 duration [3]. 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 EVA [4]. 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, who found that duration of hospital stay was significantly less in MVA being 5.8 hours as compared to 19.3 hours in EVA [5].

A study by Bluementhal PD also supported our findings [6]. Koontz SL and colleagues compared MVA with sharp curettage and interpreted that MVA has shorter hospital stay of 28% as compared to sharp curettage [7]. Khani, et al. conducted a study comparing MVA with curettage and concluded less blood loss and shorter duration of procedure in MVA group [8]. A Brazilian study by Pereira et al concluded that duration of procedure and hospital stay was significantly shorter in MVA group [9]. 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 group [10]. 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 losses [11]. Similar trend was observed by Kerure, et al. He found out that women undergoing MVA had less blood loss when compared with electrical vacuum aspiration [4].

Hence it may be concluded that vacuum aspiration by any method becomes increasingly difficult as gestational age advances. These results are compared with study conducted by international fertility research program. A program of family health international research triangle park, North Carolina 27709 USA. The results of present study indicate that manual vacuum aspiration procedure offers many practical advantages adopting MVA procedure leads to marked improvement in the quality of abortion care like.

## **Conclusion**

MVA procedure leads to marked improvement in the quality of abortion care, being its low maintenance, relatively inexpensive and easily transportable instrument ,with eliminating need for electricity with these features combined with success in first trimester pregnancy termination which is equal with electrical vacuum aspiration

as suggested by this study increases its use in developing countries like India.

## References

1. Das V, Jain S, Gupta HP, Agarwal A, Sujatha, Pandey A. Evaluation of newer methods of early pregnancy termination. *J Obstet Gynecol India*, 2005; 55: 454-6.
2. Tasnim N, Mahmud G, Fatima S, Sultana M. Manual vacuum aspiration: a safe and cost effective substitute of Electric vacuum aspiration for the surgical management of early pregnancy loss. *J Pak Med Assoc.*, 2011; 61: 149-53.
3. Davis A, Westhoff C, De Nonno L. Bleeding patterns after early abortion with mifepristone and misoprostol or manual vacuum aspiration. *J Am Med Womens Assoc.*, 2000; 55: 141-4.
4. Kerure SB, Kerure RD, Sagarad SS, Biradar V. A comparative study of manual vacuum aspiration and electrical vacuum aspiration for up to 10 weeks gestation. *Int J Reprod Contracept Obstet Gynecol.*, 2013; 2: 199-203.
5. Edwards J, Crenin MD. Surgical abortion for gestation of less than 6 weeks. *Curr Probl Obstet Gynecol Fertil.*, 1997; 20: 11-9. 13.
6. Bluementhal PD, Remsburg RE. A time and cost analysis of the management of incomplete abortion with manual vacuum aspiration. *Int J Gynaecol Obstet.*, 1994; 45: 261-7.
7. Koontz SL, Molina de Perez O, Leon K, Foster Rosales A. Treating incomplete abortion in El Salvador: cost saving with manual vacuum aspiration. *Contraception*, 2003; 68: 345-51.
8. Khani B, Karami M, Khodakarami N, Solgi T. Comparison of incomplete abortion treatment between manual vacuum aspiration and curettage. *Journal of Isfahan Medical School*, 2010; 27(102): 753-60.
9. Pereira PP, Oliveira AL, Cabar FR, Armelin AR, Maganha CA, Zugaib M. Comparative study of manual vacuum aspiration and uterine curettage for treatment of abortion. *Rev Assoc Med Bras.*, 2006; 52(5): 304-7.
10. Arif N, Ahmed RQ, Sheikh NA, Shahid A. Comparison of manual vacuum aspiration with suction and curettage in early loss of pregnancy. *JSOGP*, 2015; 5(4): 198-203.
11. Mansoor A, Jabeen J, Mansoor MH. Assessment of efficacy and safety of manual vacuum aspiration (MVA). *JRMC*, 2013; 17(1): 107-109.