

ORIGINAL ARTICLE

COMPARISON OF MANUAL VACUUM ASPIRATION, AND DILATATION AND CURETTAGE IN THE TREATMENT OF EARLY PREGNANCY FAILURE

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Objectives: To compare the efficacy, safety and cost effectiveness of Manual Vacuum Aspiration (MVA) with dilatation and curettage (DNC) in the management of early pregnancy failure. **Methods:** One hundred patients of spontaneous abortion, incomplete or missed, with gestational age <12 weeks were included in the study. Using a Random Number Table, these patients were assigned to undergo either DNC or MVA. **Results:** The distribution of age, parity and gestational age was similar in both groups. The mean duration of procedure was significantly higher ($p<0.0001$) in DNC (8.98 ± 2.64 minutes) as compared to 5.88 ± 2.43 minutes in MVA. The duration of hospital stay was significantly lower ($p<0.0001$) in MVA group (3.48 ± 1.2 hours) as compared to 7.42 ± 1.93 minutes in DNC group. Similarly the cost of procedure was also significantly lower ($p=0.0001$) in MVA group (PKR 1410 ± 243.4) compared to PKR 3460 ± 908.24 in DNC group. **Conclusion:** MVA is as effective as conventional dilatation and curettage for treatment of early pregnancy failure while it causes less blood loss, is less time consuming, requires a shorter hospital stay and thus costs less. It does not require general anaesthesia and complication rate is less than dilatation and curettage.

Keywords: manual vacuum aspiration, dilatation and curettage, early pregnancy failure

INTRODUCTION

Early pregnancy failure is a major health problem worldwide which occurs in 15–20% of pregnancies.¹ In developing countries like Pakistan 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. The present study was conducted to compare the safety and efficacy of most commonly used method of evacuation of uterus, i.e., DNC with a simpler and cheaper method of evacuation, i.e., MVA.

MATERIAL AND METHODS

This Randomised Controlled Trial was conducted from January to July 2010 at Department of Obstetrics and Gynaecology, Akhtar Saeed Trust Teaching Hospital, Lahore. The study was approved by Ethical Review Board of the Hospital.

The sample size was calculated with Open-Epi 2.3.1 keeping power of study as 80%, confidence level of 95% and 50% expected reduction in the procedure time of MVA as compared to DNC. The procedure time of DNC was taken from the study of Pereira *et al.*⁷

One hundred women presenting with spontaneous miscarriage (incomplete or missed) with gestational age <12 weeks and no signs of septic abortion (fever >37.7 °C, purulent vaginal discharge, tachycardia or abdominal distension) were included in the study. Patients with septic abortion, bleeding disorders, molar pregnancies, pregnancies more than 12 weeks, severe anxieties and unwilling patients were excluded from study. Using a Random Number Table, these patients were assigned to undergo either DNC or MVA. Written informed consent was taken and

procedure and its complications were explained to the patients.

Dilatation and Curettage was done in the operation theatre under general anaesthesia and MVA was carried out in the examination room under paracervical block with Ipas MVA system which consists of an aspirator and cannula. The patients with missed abortion and closed cervical os were asked to take 400mcg of misoprostol sublingually 2 hours before coming to hospital. 400 mg of ibuprofen was given to the patient orally half an hour before MVA. All the procedures were conducted by consultants, senior registrars and medical officers. The patients were assessed regarding completion of evacuation, duration of procedure, blood loss, complications of procedure, cost and duration of hospital stay. Completion of procedure was confirmed by sharp curettage or ultrasound if required. Blood loss was assessed by the amount of blood present in the aspirator cannula while in DNC the blood lost was collected in kidney tray and measured. After the procedure patients were transferred to recovery room. Most of the patients with MVA were discharged from there within 2–4 hours, while most of the patients who had DNC were shifted to the ward and discharged from there later when stable. They were called after one week to see any signs of infection including pain lower abdomen, vaginal discharge and fever. Bimanual examination was done to assess size of uterus and vaginal bleeding. In case of any complication management was done accordingly.

The data was collected on a structured questionnaire and analysed using SPSS-17. Student's *t*-test was used to compare the means, while Chi-Square test was used to compare the percentages. The $p \leq 0.05$ was taken as significant.

RESULTS

The demographic characteristics of both groups were similar. The age of the women ranged from 18–45 years. The mean age of the women was 29.35±6.4 years in DNC group and 28.04±6.19 years in MVA group ($p=0.296$). The parity ranged from 0 to 7 with a median parity of 3 in either group ($p=0.82$). The gestational age ranged from 5–12 weeks. The mean gestational age in DNC group was 8.46±1.88 weeks and 8.32±1.56 weeks ($p=0.298$).

The procedure-related characteristics of both groups are shown in Tables-1 and 2. The mean duration of procedure was significantly higher ($p < 0.0001$) in DNC (8.98±2.64 minutes) compared to 5.88±2.43 minutes in MVA (Table-1). The duration of hospital stay was significantly lower ($p < 0.0001$) in MVA group (3.48±1.2 hours) as compared to 7.42±1.93 minutes in DNC group (Table-1). Similarly the cost of procedure was also significantly lower ($p=0.0001$) in MVA group

(PKR 1410±243.4) compared to PKR 3460±908.24 in DNC group (Table-2).

The complications included anaesthetic complications like perforation, incomplete evacuation, blood loss >100 ml, infection and cervical trauma. All these complications were present in DNC group, whereas the only complication of MVA was incomplete evacuation (Table-2).

Table-1: Comparison of Procedure-related Characteristics of both groups

Duration of Procedure (Minutes)			
Characteristic	MVA	DNC	P
≤5	29 (58%)	4 (8%)	0.0001
6–10	19 (38%)	33 (66%)	0.009
11–15	2 (4%)	13 (26%)	0.005
Mean±SD	5.88±2.43	8.98±2.64	0.0001
Hospital Stay (Hours)			
<5	45 (90%)	5 (10%)	0.0001
5–8	5 (10%)	31 (62%)	0.0001
9–12	0	10 (20%)	0.0001
>12	0	4 (8%)	0.0001
Mean±SD	3.3±0.91	6.14±2.48	0.0001

Table-2: Comparison of Complications and Cost

Complications			
Characteristic	MVA	DNC	p
Anaesthetic	None	8 (16%)	0.0001
Perforation	None	1 (2%)	0.0001
Incomplete evacuation	2 (4%)	1 (2%)	0.0001
Blood loss >100ml	None	11 (22%)	0.0001
Infection	None	3 (6%)	0.0001
Cervical trauma	None	2 (4%)	0.0001
Costs (Rupees)			
1000–2000	50 (100%)	0	0.0001
3000–4000	0	45 (90%)	0.0001
5000 and above	0	5 (10%)	0.0001
Mean±SD	1410±243.38	3640±908.24	0.0001

DISCUSSION

Uterine emptying accomplished via MVA in early pregnancy failure is presented by many authors as an alternative therapy to dilatation and curettage, with the advantage of replacement of general anaesthesia by analgesics or paracervical block, less complication rate, shortening of hospital stay, the reduction of hospital costs and utilisation of fewer resources.^{10,11} Despite being simple, inexpensive and easy to handle, its use has been restricted because most of clinicians are not familiar with its use. MVA is being used in our department for the last 2 years and we have found it effective, safe, cheap and easy to handle. In the present study the mean duration of the procedure was significantly higher ($p < 0.0001$) in DNC compared to MVA. The duration of hospital stay was significantly lower ($p < 0.0001$) in MVA group. Similarly the cost of procedure was also significantly lower ($p=0.0001$) in MVA group. Data from a major retrospective study of 1,677 MVA procedures for elective abortion (99% <10 weeks gestational age) showed 99.5% effectiveness and minimal complications (0.5% repeat aspirations, 0.7%

infections and 0.6% uterine perforations).¹² Fonseca *et al* evaluated 30 patients with diagnosis of incomplete abortion; divided into two groups and each one was subjected to a treatment modality. They concluded that patients treated with MVA needed 77% less hospital stay and consumed 41% less hospital resources than patients treated with DNC.¹³ Data from a prospective study of 115 women with early pregnancy loss cared for in the outpatient setting (MVA) shows minimal complications; repeat aspirations (3%), post-procedure infections (2%).⁴ Shelley *et al*, compared the effectiveness and safety of medical and expectant management with surgical management for first trimester incomplete or inevitable miscarriage in a prospective study of 45 women and found that effectiveness at 8 weeks was lower for medical (80.0%) and expectant (78.6%) than for surgical management (100%). Two women in the medical group had confirmed infections. Bleeding lasted longer in the expectant group than in the surgical group. There were no significant differences in pain, physical recovery, anxiety or depression between the groups.¹⁴ In another study conducted by Khani *et al*, comparing MVA with curettage, the duration of surgery was significantly shorter in the MVA group and patients had more bleeding in curettage group.¹⁵ Various other trials reported 95–100% efficacy with MVA.^{16,17} These results correlate well with the findings of our study. There were more complications in the curettage group as compared to MVA group in the present study. Most of these were minor complications and were managed easily. One patient who had perforation had to undergo laparotomy. Two patients in the MVA group and one in curettage group had re-evacuation of uterus due to retained products of conception which was confirmed by ultrasonography. High vaginal swabs of the patients with infection were taken and they were given antibiotics according to culture and sensitivity. Although the complication rate due to unsafe abortion in Pakistan is very high, the use of MVA is still very limited. According to Population Council's study, even qualified health professionals from secondary and tertiary-care set-ups reported DNC as the most commonly used method (72%) followed by medical methods.¹⁸ The commonest complications noted by Khanum and Mirza from Lahore were post-abortion sepsis (79.7%) followed by haemorrhage (30%), and gut injury (11.2%)¹⁹ while septicaemia, bowel injury and haemorrhagic shock reported by Bhutta *et al* from Karachi²⁰. Studies by Rehan have pointed out that the major factors leading to the complications were ill-equipped clinics, un-qualified operators and excessive use of dilatation and curettage.^{21,22} Pereira *et al* from Brazil, compared efficiency, frequency of complications, duration of the procedure, and duration of hospitalisation among patients undergoing MVA and

DNC for incomplete miscarriage.⁷ They found that durations of the procedure and of hospitalisation were significantly shorter in the MVA group. They also observed that decrease of haemoglobin levels was greater in the DNC group.

The evacuation of uterus by MVA is an effective alternative to evacuation by sharp curette and has a better safety profile. Midwives and nurses can easily be trained and is very useful for a resource poor country like Pakistan, where most of the patients do not have access to health care professionals. There is need to emphasise health care providers to increase its use in the management of early pregnancy failure so as to reduce maternal mortality and morbidity.

CONCLUSION

For treating abortions of <12 weeks gestation, MVA is effective, less time consuming and cheaper procedure, which is free from major complications of DNC and allows the patient to leave the health facility in shorter time.

ACKNOWLEDGEMENT

The authors acknowledge the technical help rendered by Dr. N. Rehan, Chief Executive, Research Associates, Lahore in data analysis and literature review.

REFERENCES

- Weeks A, Alia G, Blum Jr, Winikoff B, Ekwaru P, Mirembe F. A randomized trial of Misoprostol compared with Manual Vacuum Aspiration for incomplete abortion. *Obstet Gynecol* 2005;106(3):540–47.
- Shaikh Z, Abbasi RM, Rizwan N, Abbasi S. Morbidity and mortality due to unsafe abortion in Pakistan. *Int J Gynecol Obstet* 2010;110(1):47–49.
- Jafarey SN. Maternal Mortality in Pakistan—An overview of Maternal and Perinatal Health in Pakistan. *Proceedings of Asian and Oceanic Federation of Obstetrics and Gynaecology Workshop, Karachi, November 1991.*
- Dalton V K, Harris L, Weisman Carol S, Guire K, Castleman L, Lebovic D. Patient Preferences, Satisfaction, and Resource Use in Office Evacuation of Early Pregnancy Failure. *Obstet Gynecol* 2006;108(1):103–10.
- Ahsan A, Jafery SN. Unsafe Abortion: Global Picture and Situation in Pakistan. National Committee for Maternal and Neonatal Health (NCMNH) 2008). Available at: <http://www.jpma.org.pk/PdfDownload/1562.pdf>
- Coombes R. Obstetricians seek recognition for Chinese pioneers of safe abortion. *BMJ* 2008;336(7657):1332–3.
- 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.
- Blumenthal PD, Remsburg RE. A time and cost analysis of the management of incomplete abortion with manual vacuum aspiration. *Int J Gynecol Obstet* 1994;45:261–7.
- Wen J, Cai QY, Deng F, Li YP. Manual versus electric vacuum aspiration for first trimester abortion: a systematic review. *BJOG* 2008;115(1):5–13.
- Chen BA, Creinin MD. Contemporary management of early pregnancy failure. *Clin Obstet Gynecol* 2007;50(1):67–88.
- Bird ST, Harvey SM, Nichols MD, Edelman A. Comparing the acceptability of manual vacuum aspiration and electric vacuum

- aspiration as methods of early abortion. *J Am Med Womens Assoc* 2001;56:124–6.
12. Westfall JM, Sophocles, Burggraf H, Ellis S. Manual vacuum aspiration for first-trimester abortion. *Arch Fam Med* 1998;7:559–62.
 13. Fonseca W, Misago C, Fernandes L, Correia L, Silveira D. [Use of manual vacuum aspiration in reducing cost and duration of hospitalization due to incomplete abortion in an urban area of northeastern Brazil]. *Rev Saúde Pública* 1997;31:472–8. [Article in Portuguese]
 14. Shelley JM, Healy D, Grover S. A randomised trial of surgical, medical and expectant management of first trimester spontaneous miscarriage. *Aust NZJ Obstet Gynaecol* 2005;45(2):122–7.
 15. Khani B, Karami N, 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.
 16. Say L, Kulier R, Gulmezoglu M, Campana A. Medical versus surgical methods for first trimester termination of pregnancy. *Cochrane Database Syst Rev* 2005;25:CD003037.
 17. Greensalad F, Benson J, Winkler J, Henderson V, Leonard A. Summary of clinical and programmatic experience with manual vacuum aspiration. *Adv Abort Care* 1993;3:1–4.
 18. Population Council. Unwanted Pregnancy and Post-Abortion Complications in Pakistan: Findings from a National Study. Islamabad: Population Council; 2004.
 19. Khanum Z, Mirza SM. Induced Abortion and its complications. *Ann King Edward Med Coll* 2000;6-4:367–8.
 20. Bhutta SZ, Aziz S, Korejo R. Surgical complications following unsafe abortion. *J Pak Med Assoc* 2003;53:286–9.
 21. Rehan N. Unsafe Abortion, Magnitude and Perceptions. Lahore: Family Planning Association of Pakistan, 1998.
 22. Rehan N. Attitudes of Health Care Providers to Induced Abortion in Pakistan. *J Pak Med Assoc* 2003;53:293–5.

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