Original Article

Manual Vaccum Aspirator: A Changing Trend

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Objectives: To compare manual vacuum aspiration (MVA) and uterine curettage (D&C) for first trimester abortions, in terms of the frequency of complications, incomplete procedure, blood loss, duration of patients' hospitalization and patient satisfaction.

Methods: In a prospective study, 100 patients in the MVA group A and 100 in the D&C group B were randomly included. Inclusion criteria included patients with missed or incomplete miscarriage at gestational age less than 12 weeks calculated from last menstrual period. In case of incomplete miscarriage, endometrial thickness should be more than 16mm on endovaginal scan. Pre evacuation haemoglobin more than 10g/dl, afebrile state. Blood samples were collected before and after surgical procedures for control of hemoglobin levels. . Both groups were evaluated intra and post operatively as regard to: uterine perforation, blood loss (pre and post hemoglobin),pelvic infection, retained products of conception(incomplete procedure) ,duration of hospitalization and patients satisfaction.

Results: Characteristics of the study population at enrollment were similar in two groups regarding age, gestational age in weeks and ultrasonographic parameters and indications for procedure. However more patients in group A are multigravida whereas more patients in group B are either primigravida or para 1 or 2. Both groups showed the same efficiency in emptying of the uterus with 6 incomplete procedures in group A and 4 incomplete procedures in group B (p value>0.05).1 uterine perforation was observed in group A and 3 in group B(p value<0.02).There were 2 cases of pelvic infection in group A and 4 in group B(p value>0.05). In the patients who have undergone the uterine curettage, the duration of hospital stay was on average, 18.32 hours (± 8.01), and in the patients who underwent vacuum aspiration the mean time was 7.12 hours (± 1.44) (p <0.0001). All the patients who had manual vacuum aspiration are satisfied with the modality whereas patient satisfaction rate was 95% in group B who had curettage (p value<0.0001). The decrease in hemoglobin rates was higher in the Group of patients subjected to uterine curettage, i.e. from 12.44mg/dl to 11.39mg/dl as compare to patients subjected to MVA i.e.from12.55mg/dl to 11.92mg/dl (p value<0.0001).

Conclusions: MVA caused less blood loss, was less time consuming, and resulted in shorter hospitalization.

Keywords: Miscarriage, Uterine curettage. Manual vacuum aspiration. First trimester of pregnancy.

Introduction

It is estimated that 40% of all women will end a pregnancy by abortion at sometime in their reproductive life. Spontaneous pregnancy loss occurs in 25% to 50% of pregnancies prior to 14 weeks of gestation.[1] In 2003, about 16 women for every thousand aged 15-44 year had an abortion. For every 1000 live births about 241 abortions were performed according to centre of disease control and prevention. According to WHO in its 2005 World Health Report, "Make every mother and child count", states major cause of maternal mortality with unsafe abortions (13%) at the third number after hemorrhage (25%) and infections (13%). Unintended pregnancy is a major cause of death. World wide unintended pregnancy resulted in 700,000 maternal deaths from 1995 to 2000.[2] The majority (64%) resulted from complications of unsafe or unsanitary abortions. In fact a study carried out in Lahore, revealed a maternal mortality rate of 4.17% due to induced miscarriages by untrained persons or in unsanitary conditions.[3]

Women experiencing complications from spontaneous or unsafely induced abortions have the right to receive high quality health care services. Once a pregnancy loss has been diagnosed, there are three forms of management: Expectant, Medical and Surgical.[1] Expectant management means leave to nature and let the process of abortion start and complete by itself.

Medical management for first trimester abortion includes use of mifepristone and methotraxate in combination with misoprostol. The perceived benefit of medical abortion are the abilities to avoid surgery and its discomfort and associated morbidity.[4] Even though medical management has been well accepted by patients, its routinely requires multiple visits and the need for unplanned after hours intervention is not uncommon. The rate of successful medical abortion are 90-98%for less than 6 weeks of gestation, 89-98% at 7 weeks of gestation, 82%-96% at 8 weeks of gestation and 60% at greater than 8 weeks of gestation.[5,6,7] In developing counties including Pakistan where mifepristone is not available and methotraxate is not used in routine because of its side effects and patients compliance in view, misoprostel alone is used in routine for medical management of abortions with success rate of 50.4%.[8,9] Surgical methods include dilatation and curettage and manual vaccum aspiration. Dilatation and curettage refers to dilatation of cervix and surgical removal of contents of uterus by scrapping and scooping (curettage) under general anesthesia.

Whereas the MVA is a technique of suction curettage performed using a hand held syringe attached to a uterine catheter.[10] It uses aspiration to remove uterine contents through the cervix. It is done as an outpatient procedure avoiding general anesthesia and hence prolonged hospital stay when compared to conventional dilatation and curettage. Post treatment care includes a brief observation in recovery area and discharge with follow up appointment. MVA, when used in early pregnancy losses, has lower complications as compared to Dilatation and curettage and is 98% effective in removing all uterine contents. Trials have shown that MVA is associated with significant decreased blood loss, less pain, shorter procedure time and stay in hospital.[11] Major complications like perforation and sepsis are even lower as compared to sharp curettage.

In most developed countries, MVA has replaced sharp metal curettage, but in many developing countries, physicians continue to use sharp curette because they are not trained in vaccum aspiration or do not have necessary equipment. Many studies have documented the safety of vaccum aspiration and WHO includes it as an essential obstetric service at the first level of care. (WHO 1991)

Material and Methods

The study was carried out on 200 patients with missed or incomplete first trimester abortions admitted to Fatima Memorial Hospital, Shadman, Lahore from January 2010 to December 2012. 100 were subjected to manual vaccum aspiration (Group A) and another 100 were subjected to conventional dilatation and curettage or evacuation and curettage (Group B).

Inclusion criteria included patients with missed or incomplete miscarriage at gestational age less than 12 weeks calculated from last menstrual period. In case of incomplete miscarriage, endometrial thickness should be more than 16mm on endovaginal scan. Pre evacuation haemoglobin more than 10g/dl. Blood group was done so one can give Anti-D accordingly. In order to rule out septic abortion axillary temperature was recorded. Exclusion criteria included haemoglobin less than 10g/dl, heavy vaginal bleeding, suspicion of gestational vaginal disease and previous cesarean section. The study followed a quasi experimental randomized trial design. Patients were divided into two groups (group A MVA, group B D&C) using a simple random sampling method. Both groups were evaluated intra and post operatively as regard to: uterine perforation, blood loss (pre and post hemoglobin), pelvic infection, retained products of conception (incomplete procedure), duration of hospitalization and patients satisfaction. Those who were allocated randomly to group A were treated by MVA after systemic analgesia (intramuscular diclofenic sodium) or sedation (intravascular buperonmaxalon). I PAS MVA with flexible cannula 4, 5,6,7,8,9,10 & 12 were used. Group B patients were treated under general anesthesia by standard D&C or E&C and standard procedure was performed. Both groups were discharged on doxycycline (200mg bd for 7days) for cover of chlymidial infection and analgesics were prescribed on SOS basis. Patients were asked for a follow up after 2wks and were asked about vaginal bleeding (to rule out RPOC's and a scan was planned to confirm the diagnosis) fever and offensive discharge (pelvic infection), use of analgesics and satisfaction rate. Satisfaction was assessed by asking the patient if she would prefer the procedure again if, unfortunately, she has a miscarriage again in life or would she recommend the procedure to her friends and family in case of miscarriage.

Results

The duration of hospital stay is significantly different between the two groups. In the patients who have undergone the uterine curettage the duration of

Table-1: Demographic characteristics of study population.

	Group A(MVA) n=100 Mean±SD	Group B (D&C) n=100 Mean±SD	P-Value
Age (years)	26.65±6.8	27.50±6.9	0.38
Parity n (%)	n (%)	n (%)	
0	29 (29)	33.(33)	<0.0001
1	15 (15)	18 (18)	<0.0001
2	35 (35)	38 (38)	0.0008
>3	21 (21)	11 (11)	<0.0001
Gestational age (wks) mean±SD	9.73±2.6	9.93±2.4	0.71
Indications for procedure)	n (%)	n (%)	
Incomplete	63 (63)	58 (58)	0.051
Missed	37 (37)	42 (42)	0.040
Ultasonographiic parameters	Mean=SD	Mean=SD)	
Gestational age on scan (weeks)	7±3	6.7±2.8	0.767
Endometrial thickness (mm)	22.14±4.8	22.68±5.68	0.65

P value<0.05 is considered significant

Table-2: Outcome measures.

	Group A(MVA) n=100 n (%)	Group B (D&C) n=100 n (%)	P-Value
Uterine perforation	1 (1)	3 (3)	< 0.02
Pelvic infection	2 (2)	4 (4)	0.700
Incomplete procedure	6 (6)	4 (4)	0.516

P value <0.05 is considered significant

Table-3: Secondary outcome measures.

	Group A n=100	Group B n=100	P-Value
Duration of hospital stay (hours)	7.12±1.44	18.32±8.01	<0.0001
Patient santisfaction	Group A	Group B	
Yes	100 (100%)	95 (0%)	<0.0001
No	0 (0%)	5 (5%)	

P value<0.05 is considered significant

the mean time was 7.12 hours (±1.44) (p <0.0001). All the patients who had manual vacuum aspiration are satisfied with the modality whereas patient satisfaction rate was 95% in group B who had curettage (p value<0.0001) The decrease in hemoglobin rates was higher in the Group of patients subjected to uterine curettage, i.e. from 12.44mg/dl to 11.39mg/dl as compare to patients subjected to MVA i.e.from12.55mg/dl to 11.92mg/dl(p value<0.0001)

Discussion

At our hospital, as in most public hospitals, the most commonly used method for treatment of incomplete and missed abortion in the first trimester (up to 12 weeks gestation) is the emptying of the uterus by curettage, under general anesthesia, or medical termination. The risks of anesthetic and surgical procedure as well as the exposure of patients to infection by staying in hospitals, can contribute to increasing morbidity and maternal mortality and

hospital costs. Medical methods if fails often leads to D&C and thus patient often refuses it on this basis or is less satisfied with this method.

Vacuum aspiration is safer than sharp curettage, and the WHO recommends vacuum aspiration as the preferred method for uterine evacuation before 12 weeks of pregnancy.[12] With regards to the safety and adverse effects of two treatment modalities, MVA was found safer than EVA. one uterine perforation occurred in MVA group versus three perforations in EVA group. This may be attributable to flexible, soft and easy to handle cannula used in MVA versus metallic hard and non flexible cannula in EVA. Review of literature in this regard shows a uterine perforation rate of 0.06% for MVA.[13] The overall early complication rate (hemorrhage, uterine perforation, cervical injury) is between 0.01 and 1.16%.[14] The MVA is associated with the small number of complications i.e. uterine perforation.[15,16] Westfall et al. used MVA for treatment of incomplete abortions and demonstrated effectiveness of 99.5% with no major complications.[13] various studies have confirmed safety of MVA.[16,17] Minor complications seen in our study, have been reported in 0.7%-2% cases.[18,19] Infection being the commonest among these. In our study infection is in 2 patients in MVA group as compare to 4 patients in D&C group.

Complete evacuation rate with single intended modality was 94% for MVA vs 96% for D&C. Other studies comparing MVA with other surgical methods have shown similar success rates, 95.2% vs. 97.6% and 98% vs. 95% respectively.[20,21] A meta analysis based on the results of 10 studies involving 1660 women have shown no significant difference between the two methodologies in terms of complete abortion rate.

The emptying of the uterus by manual vacuum aspirator is presented as an alternative therapy, with the advantage of replacing the general anesthesia for pain relievers or paracervicalblock, which shorten hospital stay and reduce the cost of the procedure.[22,23]

It has been observed decrease in hemoglobin rates after both procedures, being greater in the Group of patients subjected to uterine curettage.[24,25]

In the present study, the average time for the emptying of the uterus by curettage was greater than in the group treated with MVA (2.5 times higher), result, therefore, in agreement with other studies.[16]

Also, in this study, we have seen that the length of stay in hospital was different between the two groups; the patients subjected to manual vacuum aspirator were interned, on average, 7 hours while the patients who underwent D & C were retained for 18 hours (on average). In our study the satisfaction rate with manual vacuum aspirator is 100% whereas in D&C group it is 95 %.in different studies conducted worldwide manual vacuum aspirator is associated with high satisfaction rates.[28,29]

MVA has been used worldwide for more than 30 years and has been a safe and effective procedure for the management of early pregnancy loss.[30] This method is faster, safer, more comfortable, and associated with shorter hospital stay for induced abortion than sharp curettage.[31] Additional advantages compared with sharp curettage are its ease of use as an outpatient procedure, the need for less analgesia and anesthesia,[32] and its lower cost per procedure especially if done on an outpatient basis.[33] In countries with a small number of physicians, vacuum aspiration can be safely and effectively used by mid-level health service providers, such as midwives.[34] despite being simple, inexpensive and easy to handle tool, its use in most of the hospitals is restricted due to unfamiliarity of the clinicians with its use. A high success rate with no major complications with MVA provides evidence that the technique is safe and easy to learn.

Conclusion

MVA cause less blood loss, is less time consuming, and results in shorter hospitalization. However, both surgical procedures were found to be equally in treatment of incomplete abortions during the first trimester of pregnancy success full.

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References

1. Allison JL, Sherwood RS, Schust DJ, Management of First Trimester Pregnancy Loss Can Be Safely Moved Into the Office. Rev Obstet Gynecol. 2011; 4(1): 514
2. Promises to Keep: The Toll of Unintended Pregnancies on Women's Lives in the Developing World. Retrieved 2009-01-22.
3. Gul A. Maternal Morbidity and Mortality Associated with Criminally Induced abortion (CIA) - A 10 years review at Lahore General Hospital, Lahore. Ann King Edward Med Uni ;7 (1):6466.
4. Schaff EA, Eisinger SH, Franks P, et al. Methotrexate and misop

rostol for early abortion. Fam Med. 1996;28:198-203
5. Wiebe ER. Abortion induced with methotrexate and misoprostol. CMAJ. 1996;154:165-170
6. Creinin MD, Darney PD. Methotrexate and misoprostol for early abortion. Contraception. 1993;48:339-348.
7. Harvey SM, Beckman LJ, Castle MA, et al. Knowledge and perceptions of medical abortion among potential users. Fam PlannPerspect. 1995;27:203-207.
8. Khan F M, Amin A, Ahmad FL, Naeem NK Medical Termination of First Trimester Miscarriages. Ann King Edward Med Uni.2009;13 (2):154-157.
9. Edwards S, Tureck R, Fredrick M, Huang X, Zhang J, Barnhart K. Patient acceptability of manual versus electric vacuum aspiration for early pregnancy loss. J Womens Health. 2007;16 (10):1429-36.
10. Dalton VK, Saunders NA, Harris LH, Williams JA, LebovicDI. Intrauterine adhesions after manual vacuum aspiration for early pregnancy failure. Fertil Steril. 2006 Jun;85(6):1823.e1-3.
11. Forna F, GülmezogluAM.Surgical procedures to evacuate incomplete abortion. Cochrane Database Syst Rev.2001;(1):CD 001993.
12. World Health Organization. Safe abortion: technical and policy guidance for health systems. Geneva: World Health Organization, 2003.
13. Westfall JM, Sophocles A, Burggraf H, Ellis S. Manual vacuum aspiration for first-trimester abortion. Arch Fam Med 1998; 7: 559-62.
14. Soulat C, Gelly M.[Immediate complications of surgical abortion]. J Gynecol Obstet Biol Reprod (Paris). 2006 Apr;35 (2):157-62.
15. Goldberg AB, Dean G, Kang MS, Youssof S, Darney PD. Manual versus electric vacuum aspiration for early first-trimester abortion: a controlled study of complication rates..Obstet Gynecol. 2004 Jan;103(1):101-7.
16. Warriner IK, Meirik O, Hoffman M, Morroni C, Harries J, My Huong NT,et al. Rates of complication in first-trimester manual vacuum aspiration abortion done by doctors and mid-level providers in South Africa and Vietnam: a randomised controlled equivalence trial. Lancet. 2006 Dec 2;368 (9551):1965-72.
17. Macisaac L, Darney P. Early surgical abortion: an alternative to and backup for medical abortion.Am J Obstet Gynecol. 2000 Aug;183 (2 Suppl):S76-83.
18. Greenslade 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.
19. Milingos DS, Mathur M, Smith NC, Ashok PW. Manual vacuum aspiration: a safe alternative for the surgical management of early pregnancy loss. BJOG 2009; 116: 1268-71.
20. Hemlin J, Moller B. Manual vacuum aspiration, a safe and effective alternative in early pregnancy termination. Acta Obstet Gynecol Scand 2001; 80: 563-7.
21. Edwards S, Tureck R, Fredrick M, Huang X, Zhang J, Barnhart K. Patient acceptability of manual versus electric vacuum aspiration for early pregnancy loss. J Womens Health 2007; 16: 1429-3
22. Benson J, Nicholson LA, Gaffikin L, Kinoti SN. Complications of unsafe abortion in sub-Saharan Africa: a review.Health Policy Plan. 1996 Jun;11(2):117-31.
23. Koontz S. Perez O M. Leon K. Rosales AF. Treating incomplete abortion in El Salvador: cost savings with manual vacuum aspiration. Contraception.2003 November; 68(50:345-351.Kulier R, Fekih A, Hofmeyr GJ, Campana A. Surgical methods for first trimester termination of pregnancy. Cochrane Database Syst Rev.2001;(4):CD002900.
25. Wen J, Cai QY, Deng F, Li YP. Manual versus electric vacuum aspiration for first-trimester abortion: a systematic review. BJOG. 2008 Jan;115 (1):5-13.
26. Magotti RF, Munjinja PG, Lema RS, Ngwalle EK. Cost-effectiveness of managing abortions: manual vacuum aspiration (MVA) compared to evacuation by curettage in Tanzania. East Afr Med J 1995;72:248-51.
27. 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 Saude Publica. 1997 Oct;31 (5):472-8.
28. Dean G, Cardenas L, Darney P, Goldberg A. Acceptability of manual versus electric aspiration for first trimester abortion: a randomized trial.Contraception. 2003;67(3):201.
29. Gazvani R, Honey E, MacLennan FM, Templeton A. Manual vacuum aspiration (MVA) in the management of