

Incomplete miscarriage during the first trimester: a comparison of indoor versus outdoor procedure

Faiza Iqbal¹, Sadia Azmat², Rabia Jamshaid³, Zunaira Arshad⁴, Anum Saqib⁵

¹ Senior Registrar, Shalamar Medical and Dental College, Lahore.

³ Post-graduate Trainee, Shalamar Medical and Dental College, Lahore.

² Consultant Gynaecologist, THQ Hospital Chichawatni, Sahiwal.

^{4,5} Consultant Gynaecologist, Shalamar Medical and Dental College, Lahore.

Author's Contribution

¹ Conception of study

² Experimentation/Study conduction

³ Analysis/Interpretation/Discussion

⁴ Manuscript Writing

¹ Critical Review

⁵ Facilitation and Material analysis

Corresponding Author

Dr. Faiza Iqbal,

Senior Registrar,

Shalamar Medical and Dental College, Lahore.

Email: faizaiqbalshehzadi@gmail.com

Article Processing

Received: 26/04/2020

Accepted: 12/08/2020

Cite this Article: Iqbal, F., Azmat, S., Jamshaid, R., Arshad, Z., Saqib, S. Incomplete miscarriage during the first trimester: a comparison of indoor versus outdoor procedure. *Journal of Rawalpindi Medical College*. 30 Sep. 2020; 24(3): 235-239.

DOI: <https://doi.org/10.37939/jrmmc.v24i3.1349>

Conflict of Interest: Nil

Funding Source: Nil

Access Online:



Abstract

Introduction: Miscarriage is defined as the natural death of a fetus inside the uterus. To remove complete conception material after a miscarriage, vacuum aspiration or dilatation & curettage are methods to remove uterine contents. Controversies exist regarding both procedures. So we conducted this study to confirm the more successful method.

Objective: To compare the effectiveness of manual vacuum aspiration versus traditional evacuation and curettage (E & C) among females presenting with incomplete miscarriage during the first trimester of pregnancy.

Materials and Methods: This randomized controlled trial was done at the Department of Obstetrics & Gynecology, Shalamar Hospital, Lahore for 6 months. Then the selected females were divided randomly into 2 equal groups. In group A, females had manual vacuum procedure while in group B, females had evacuation & curettage under general anesthesia. After 12 hours of the procedure, ultrasonography was done to confirm complete evacuation.

Results: The mean age of the patients was 29.87 ± 6.71 years, the mean gestational age was 8.06 ± 2.82 weeks. The effectiveness was noted in 248 (91.85%) patients. Statistically, manual vacuum showed significantly more effective as compared to evacuation & curettage procedure in the management of incomplete miscarriage i.e. p-value= 0.008.

Conclusion: It has been proved that manual vacuum aspiration is more effective than traditional evacuation & curettage in the management of incomplete miscarriage.

Keywords: Evacuation & curettage, Manual Vacuum Aspiration, Incomplete Miscarriage.

Introduction

Miscarriage is the failure of pregnancy before the initiation of the viability period. In this case, the complete conception material does not expel and its few parts remain as residue in the uterine cavity, known to be an incomplete miscarriage.¹ Overall, the rate of miscarriage during the first trimester of pregnancy is 20%, assessed annual miscarriage rate as 29/1,000 females of reproductive age i.e. 15-49 years. An incomplete miscarriage is the most common type of miscarriage.² Among those females who have awareness about their pregnancy, the rate of incomplete miscarriage is roughly around 10-20%, but the rates in all the fertilized zygotes are about 30-50%.³ There were several options available for the management of miscarriage or early pregnancy loss including medical, surgical, and expectant management.⁴ Medical or expectant management in few cases of miscarriage has numerous benefits. But in many cases who got a large amount of conception material which retained inside the uterus is related to several complications including primary infection as well as excessive blood loss.⁴ Incomplete miscarriage is the major health concern, which must be managed very effectively with a harmless & appropriate method. It is expected that if the post-miscarriage health care facilities are initiated in such a systematic way on all the levels of the health care system, it can decline the maternal morbidity & mortality significantly.⁴

Evacuation & curettage is the most common surgical technique used for a complete evaluation of conception material after an incomplete miscarriage. In this method, the metallic surgical tools are used to evacuate the material from the uterus. This procedure is normally done under general or local anesthesia or heavy sedation. It is a time-consuming procedure and the chances of complications are also high including the incomplete clearing of uterine, major hemorrhages as well as uterine perforation, which increases the requirement of facility of the operation theatre, anesthesia, and skilled staff involved in the surgical procedure.^{5,6}

In contrast to that manual vacuum, aspiration is the extension of vacuum aspiration, which is harmless as well as time and cost-effective as compared to other surgical tools including sharp curettage, also there is less hazard of uterine perforation and can be done on an OPD basis as compared to curettage. Gentle compassionate treatment and assurances are usually satisfactory so it also lessens the cost of hospital and at

the same time ease for both; gynecologists and patients. It is a tool that can significantly reduce the rate of morbidity and mortality among pregnant females. Manual vacuum aspiration uses an aspiration method of the removal of retained conception material from the uterine through the passage of the cervix. Manual vacuum aspiration may also be used for the induced miscarriage in indicated cases like an anomaly or fetal death, also as a therapeutic method after the miscarriage, or also as the method to acquire the sample for the endometrial biopsy. The chances of post-procedural infection are much lower i.e. 0.5% as compared to any other surgical method for the completed evacuation of incomplete miscarriage.⁷

So this study aimed to compare manual vacuum aspiration and evacuation & curettage in females presenting with incomplete miscarriage. Through this study, we confirmed whether manual vacuum aspiration is better than evacuation & curettage & to promote its use routine as previous literature has conflicting results.

Objective: To compare the effectiveness of manual vacuum aspiration versus traditional evacuation & curettage in females presenting with incomplete miscarriage during the first trimester of pregnancy.

Materials and Methods

This Randomized controlled trial was conducted at the emergency section of the Department of Obstetrics and Gynecology, Shalamar Hospital, Lahore for 6 months i.e. June 2016 to December 2016. The sample size of 270 cases, 135 in each group was calculated with 80% power of study, 5% level of significance, and expected percentage of effectiveness i.e. 92% with manual vacuum aspiration and 80% with evacuation & curettage for management of females with incomplete miscarriage.

The patients were selected in the study by applying the Non-Probability consecutive sampling technique. Females of reproductive age groups, presenting with incomplete miscarriage (sudden passage of conception material with endometrial thickening > 30mm, lack of fetal cardiac activity on USG and at gestational age 4-12 weeks) were included while females with induced miscarriage, hypertensive (BP \geq 140/90mmHg), diabetic (BSR > 186mg/dl), anemic (Hb < 10mg/dl), haemodynamically unstable patients (PTT > 20 sec, aPTT > 15sec, platelet count < 15000/ml) were excluded from the study. Then informed consent was taken before enrollment in the study and all the females were informed about the procedure and

randomization in any group as well as the privacy of their data for research purposes.

The demographic profile including their name, age, gestational age was also noted. Then patients were randomly divided into two groups by using the lottery method. In group A, manual vacuum aspiration was applied to the females randomized to this group. For this group, local anesthesia was used. While in group B, evacuation & curettage was applied to the females randomized to this group. For this group, general anesthesia was used. Both procedures were done by a single surgical team with the assistance of the researcher. Then the patient was admitted to gynecology wards and was followed-up there for 12 hours. After 12 hours, females underwent an ultrasonography scan and if there was the complete evacuation of conception material within 12 hours of treatment on ultrasonography then effectiveness was noted. All this information was recorded through proforma.

Data analysis: The data was entered and analyzed using SPSS v.21. The quantitative variable like age and gestational age was presented as mean and standard deviation. Qualitative variables like effectiveness were presented as frequency and percentage. The frequency was also calculated for parity. Both groups were compared for effectiveness by using the chi-square test. P-value ≤ 0.05 was taken as significant.

Results

The mean age of the patients randomized to the manual vacuum aspiration group was 29.68 ± 7.11 years and the mean age of the patients randomized to the evacuation & curettage group was 30.05 ± 6.29 years. The mean gestational age of the patients randomized to the manual vacuum aspiration group was 8.22 ± 2.75 weeks and the mean gestational age of the patients randomized to the evacuation & curettage group was 7.90 ± 2.89 weeks. Out of 270 cases, 42 were primigravida [manual vacuum aspiration=25, evacuation & curettage=17], 69 were primiparous [manual vacuum aspiration=31, evacuation & curettage=38], 159 were multiparous [manual vacuum aspiration=79, evacuation & curettage=80]. (Table 1) The effectiveness was succeeded in 248 patients, out of which 130 had manual vacuum aspiration and 118 had evacuation & curettage. A statistically significant difference was found between both groups for effectiveness i.e. p-value=0.008. (Table 2)

Table 1: Baseline characteristics of females

Characteristics	Manual Vacuum Aspiration	Evacuation & curettage
n	135	135
Age (years)	29.68 ± 7.11	30.05 ± 6.29
Gestational age (weeks)	8.22 ± 2.75	7.90 ± 2.89
Primigravida	25	17
Primiparous	31	38
Multiparous	79	80
BMI	23.65 ± 11.27	25.96 ± 10.64

Table 2: Effectiveness of both procedures

		Manual Vacuum Aspiration	Evacuation & curettage	Total
Effectiveness	Yes	130 (96.3%)	118 (87.4%)	248 (91.9%)
	No	5 (3.7%)	17 (2.6%)	22 (8.1%)
Total		135	135	270

p-value = 0.008 (Significant)

Discussion

Miscarriage or early pregnancy loss is a major health concern all over the world. It can occur in about 15 - 20% of all pregnancies.⁸ In the developing countries including Pakistan, the complications of miscarriage s or miscarriages are the cause of maternal mortality i.e. in about 10 - 12% cases.⁹ From 8th to 13th week of gestation or pregnancy, the hazard of occurring a miscarriage is about 2% every week, which drops to 1% after 14 weeks while reduces further slowly during 14 to 20 weeks of gestation.¹⁰ The hazard of early miscarriage s or miscarriages rises as age increases for both life partners.¹⁰⁻¹³

As supported by several researchers, emptying a uterine after a pregnancy loss can be accomplished by using a manual vacuum aspiration in early phases can be an alternative for evacuation & curettage. Manual vacuum aspiration has several advantages including no or less requirement of general anaesthesia by applying analgesics or para-cervical blocks, fewer complications, shorter duration of hospital stay, the

decrease in costs of treatment of hospital and patient as well as less utilization of resources.^{14,15}

In our study, the mean value of the gestational age of manual vacuum aspiration group patients was 8.22 ± 2.75 weeks and in evacuation & curettage group patients was 7.90 ± 2.89 weeks. In this study, the effectiveness was observed in 248 (91.85%) females, out of which 130 females were from the manual vacuum aspiration group and 118 were from the evacuation & curettage group. Statistically, manual vacuum aspiration showed significantly more effective as compared to evacuation & curettage procedure in the management of incomplete miscarriage i.e. p-value = 0.008.

Fonseca et al. examined thirty females who presented with incomplete miscarriage in the first trimester. The females were randomly divided into 2 equal groups i.e. manual vacuum aspiration and evacuation & curettage. It was concluded based on findings that females who got treatment with manual vacuum aspiration required 77% less duration for hospital stay while consuming 41% fewer resources of the hospital as compared to females who underwent evacuation & curettage.¹⁶ It has been reported that manual vacuum aspiration and evacuation & curettage have equal efficacy incomplete evacuation of conception material i.e. 99%.¹⁷ In a local study it was reported that with manual vacuum aspiration, effectiveness was achieved in 96% cases, while with evacuation & curettage effectiveness was achieved in 98% cases. The difference was reported to be insignificant ($P > 0.001$).¹⁸ But in one study it was reported that with manual vacuum aspiration, effectiveness was achieved in 92% cases, while with evacuation & curettage effectiveness was achieved in 80% cases and the difference was reported to be significant ($P < 0.01$).¹¹ One more study concluded that the manual vacuum aspiration has similar effectiveness as conventional evacuation & curettage have of successful management of pregnancy loss in the early trimester, while manual vacuum aspiration also requires less time consumption, shorter duration of hospital stay, and also very cost-effective. General anesthesia is also not required as well as the complication rate is also very less as compared to evacuation & curettage.¹⁹

A study by Salam et al.,²⁰ demonstrated that the efficacy of manual vacuum aspiration was observed in 98.6% of females while the efficacy of evacuation & curettage was observed to be 88.5%. The mean gestational age at the time of procedure was 66.1 ± 8.96 days in the manual vacuum aspiration group while 64.35 ± 11.03 days in the evacuation & curettage

group. In one more study which was conducted by Khani et al, it was observed that the operative time was significantly shorter in the manual vacuum aspiration group as compared to evacuation & curettage as well as the females had also less blood loss after manual vacuum aspiration as compared to evacuation & curettage.²¹ Several other randomized trials also showed the efficacy of manual vacuum aspiration as 95 - 100%.^{22,23}

One more study revealed that manual vacuum aspiration is the most successful (99%) way for the management of females presenting with elective as well as spontaneous miscarriages. The efficacy of manual vacuum aspiration is also comparable to that of electric vacuum aspiration.²⁴ A study conducted by Das et al.,²⁵ on one hundred and forty-six females who underwent surgical procedure for the management of early pregnancy loss, partial miscarriage, retained conception product after a full-term pregnancy. Out of these 146 females, 77% of females were planned to undergo the manual vacuum aspiration procedure. The efficacy of manual vacuum aspiration was achieved in 88.18% of cases. The incomplete uterine evacuation was observed in 9.82% of females, while 1.8% of females develop major blood loss and then they were shifted to the Operation Theater for an emergency procedure.

Data from one cohort study, done on 115 females who had pregnancy loss in the early trimester, underwent a procedure that was done in an outpatient setting i.e. manual vacuum aspiration. The outcome showed very few complications including redo aspiration in 3% cases and 2% cases post-procedure infection occurred.²⁶ On the other hand in a local study it was reported that with manual vacuum aspiration, effectiveness was achieved in 96% cases, while with evacuation & curettage effectiveness was achieved in 98% cases. The difference was reported to be insignificant ($P > 0.001$).¹⁸

Conclusion

It has been proved in our study the manual vacuum aspiration significantly more effective as compared to traditional evacuation and curettage in the management of incomplete miscarriage during the first trimester of pregnancy.

References

1. Saad AF, Rahman M, Costantine MM, Saade GR. Blunt versus sharp uterine incision expansion during low transverse cesarean

- delivery: a metaanalysis. *Am J Obstet Gynecol* 2014;211(6):684. e1-. e11. DOI: 10.1016/j.ajog.2014.06.050.
2. Ascioglu O, Gungorduk K, Ascioglu BB, Yildirim G, Gungorduk OC, Cemal A. Unintended extension of the lower segment uterine incision at cesarean delivery: a randomized comparison of sharp versus blunt techniques. *Am J Perinatol* 2014;31(10):837-44. DOI: 10.1055/s-0033-1361934.
 3. Horsager R, Roberts SW, Rogers VL, Santiago-Muñoz PC, Worley KC, Hoffman BL. *Williams obstetrics, study guide*: McGraw Hill Professional; 2014.
 4. Briscoe KE, Haas DM. Developing a core outcome set for cesarean delivery maternal infectious morbidity outcomes. *Am J Perinatol* 2020;37(04):436-52. DOI: 10.1055/s-0039-1681095.
 5. Er P, Na IJR. The outcomes of extending uterine incision transversely or cephalocaudally in patients with previous cesarean section: a prospective randomized controlled study. *Offic Pub Perinat Med Found* 2017;25(1):1-5. DOI: 10.2399/prn.17.0251001
 6. Bligard KH, Durst JK, Stout MJ, Martin S, Cahill AG, Macones GA, et al. Risk factors and maternal morbidity associated with unintentional hysterotomy extension at the time of cesarean delivery. *Am J Perinatol* 2019;36(10):1054-9. DOI: 10.1055/s-0038-1676112
 7. Wikipedia. Vacuum aspiration. 2016 [cited 2016]; Available from: https://en.wikipedia.org/wiki/Vacuum_aspiration.
 8. Dugas C, Slane VH. Miscarriage. Online: NCBBI; 2020 [cited 2020]; Available from: <https://www.ncbi.nlm.nih.gov/books/NBK532992/>.
 9. Shaikh Z, Abbassi RM, Rizwan N, Abbasi S. Morbidity and mortality due to unsafe abortion in Pakistan. *Int J Gynecol Obstet* 2010;110(1):47-9. DOI: 10.1016/j.ijgo.2010.01.028.
 10. Ammon Avalos L, Galindo C, Li DK. A systematic review to calculate background miscarriage rates using life table analysis. *Birth Defects Res Part A: Clin Mol Teratol* 2012;94(6):417-23. DOI: 10.1002/bdra.23014.
 11. Giakoumelou S, Wheelhouse N, Cuschieri K, Entrican G, Howie SE, Horne AW. The role of infection in miscarriage. *Hum Reprod Update* 2016;22(1):116-33. DOI: 10.1093/humupd/dmv041.
 12. Nguyen BT, Chang EJ, Bendikson KA. Advanced paternal age and the risk of spontaneous abortion: an analysis of the combined 2011–2013 and 2013–2015 National Survey of Family Growth. *Am J Obstet Gynecol* 2019; 221(5):476. e1-. e7. DOI: 10.1016/j.ajog.2019.05.028.
 13. Hurley EG, DeFranco EA. Influence of paternal age on perinatal outcomes. *Am J Obstet Gynecol* 2017;217(5):566. e1-. e6. DOI: 10.1016/j.ajog.2017.07.034.
 14. Schreiber CA, Creinin MD, Atrio J, Sonalkar S, Ratcliffe SJ, Barnhart KT. Mifepristone pretreatment for the medical management of early pregnancy loss. *New Engl J Med* 2018;378(23):2161-70. DOI: 10.1056/NEJMoa1715726.
 15. Colleselli V, Nell T, Bartosik T, Brunner C, Ciresa-Koenig A, Wildt L, et al. Marked improvement in the success rate of medical management of early pregnancy failure following the implementation of a novel institutional protocol and treatment guidelines: a follow-up study. *Arch Gynecol Obstet* 2016;294(6):1265-72. DOI: 10.1007/s00404-016-4179-6.
 16. 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 Pub* 1997;31(5):472-8. DOI: 10.1590/s0034-89101997000600005.
 17. Farooq F, Javed L, Mumtaz A, Naveed N. Comparison of manual vacuum aspiration, and Dilatation and curettage in the treatment of early Pregnancy failure. *J Ayub Med Coll Abbottabad* 2011;23(3):28-31. PMID: 23272429
 18. El Ghafar MA. Comparative study of dilatation and curettage, manual and electric vacuum aspiration as methods of treatment of early abortion in Beni Suef, Egypt. *Int Res J Med Medical Sci* 2013; 1(1):43-50.
 19. 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. *Hypertension* 2011;1:2. PMID: 21375164
 20. Salam R, Neelofer R, Naserullah P. Comparative Study of Manual Vacuum Aspiration and Dilatation & Evacuation for the Surgical Management of Early Miscarriages: A Randomized Controlled Trial. *P J M H S* 2016;10(1):183-5.
 21. Khani B, Karami N, Khodakarami N, Solgi T. Comparison of Incomplete Abortion Treatment between Manual Vacuum Aspiration and Curettage. *J Isfahan Med School* 2010;27(102).
 22. Say L, Brahmi D, Kulier R, Campana A, Gülmezoglu AM. Medical versus surgical methods for first trimester termination of pregnancy. *The Cochrane Library* 2002. DOI: 10.1002/14651858.CD003037.
 23. Greenslade F, Benson J, Winkler J, Henderson V, Wolf M, Leonard A. Summary of clinical and programmatic experience with manual vacuum aspiration. *IPAS Adv Abortion Care* 1993;3(2):1-4. DOI:10.2307/2137992
 24. Grimes DA, Schulz KF, Cates WJ. Prevention of uterine perforation during curettage abortion. *JAMA* 1984;251(16):2108-11. PMID: 6708260
 25. Das CM, Srichand P, Khurshheed F, Shaikh F. Assessment of efficacy and safety of Manual Vacuum Aspiration (MVA). *JLUMHS* 2010;9(03):130.
 26. Dalton VK, Harris L, Weisman CS, 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. DOI: 10.1097/01.AOG.0000223206.64144.68.