International Journal of Gynaecology and Obstetrics Research
www.gynaecologyjournal.in
E-ISSN: 2663-3612, P-ISSN: 2663-3604
Received: 22-09-2025, Accepted: 21-10-2025, Published: 06-11-2025
Volume 7, Issue 2, 2025, Page No. 33-37

A comparative study of Manual Vaccum Aspiration and medical method of Termination of pregnancy upto 9 weeks in SMS Medical College, Jaipur (Raj.)

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Abstract
Background: Termination of pregnancy during the first trimester can be safely achieved through the Medical Method of Abortion (MTP) or Manual Vacuum Aspiration (MVA). While both methods are effective, comparative data on safety, efficacy, and patient outcomes remain clinically relevant.
Objectives: To compare the safety, efficacy, complications, and success rates of MTP and MVA in women undergoing pregnancy termination up to 9 weeks of gestation.
Methods: This prospective randomized comparative observational study was conducted at SMS Medical College, Jaipur, including 120 women randomized into two groups (MTP = 60, MVA = 60). Baseline demographics, procedural outcomes, post-procedural bleeding, complications, and success rates were analysed. Statistical significance was set at $p < 0.05$.
Results: Both groups were comparable in terms of age, socioeconomic status, literacy, residence, religion, and parity ($p > 0.05$). Complete abortion was achieved in 95% of MTP cases and 100% of MVA cases ($p = 0.243$). Mean bleeding duration was significantly longer in the MTP group (6.77 ± 3.73 days) compared to MVA (4.17 ± 2.57 days, $p = 0.0001$). Complications were more frequent with MTP, with higher rates of pain (66.67% vs. 35.00%), nausea (36.67% vs. 13.33%), and vomiting (23.33% vs. 8.33%) ($p < 0.05$).
Conclusion: Both MTP and MVA are safe and effective methods for first-trimester abortion. However, MVA demonstrated marginally higher success, shorter bleeding duration, and fewer systemic side effects, making it a more suitable option in resource-limited settings. MTP remains an important non-invasive alternative, with method selection best guided by patient preference, clinical suitability, and healthcare accessibility.

Keywords: Manual Vacuum Aspiration (MVA), Medical Method of Abortion (MTP), First Trimester Termination, Efficacy, Safety, Complications, Success Rate, Bleeding Duration

Introduction

Termination of pregnancy in the first trimester is a key aspect of reproductive healthcare, enabling individuals to make informed choices. The two most common methods up to nine weeks are Manual Vacuum Aspiration (MVA) and the Medical Method of Abortion (MMA), both proven safe, effective, and associated with low complication rates when performed under medical guidelines [1]. The choice depends on gestational age, patient preference, eligibility, and access to care. Abortion is recognized as a fundamental reproductive right. The World Health Organization (WHO) affirms that it is safe when conducted with evidence-based practices by trained providers [3]. Globally, most abortions occur in the first trimester, and access to safe services is essential for reducing maternal morbidity and mortality, particularly in low-resource settings where unsafe procedures remain a major health risk [4].

Manual Vacuum Aspiration (MVA) is a minor surgical procedure that uses a handheld aspirator to remove the contents of the uterus. Performed under local anaesthesia, MVA is valued for its short procedural time, high success rate, and immediate completion of pregnancy termination [5]. It is widely practiced in both developed and developing countries, especially where surgical infrastructure is limited but skilled providers are available. Compared to dilation and curettage (D&C), MVA is associated with lower complication rates, less trauma, and no need for general anaesthesia [6].

The Medical Method of Abortion (MMA) relies on pharmacological agents to induce termination. The most common regimen involves mifepristone, which blocks progesterone and halts pregnancy development, followed by misoprostol, which induces uterine contractions and expulsion [7]. MMA has a success rate of over 95% when used correctly [8]. It is particularly valued for being non-invasive, offering privacy, and in many cases allowing self-management at home [9]. However, monitoring is required to confirm complete expulsion, and cases of incomplete abortion may necessitate further doses of misoprostol or surgical evacuation [10].

Both Manual Vacuum Aspiration (MVA) and the Medical Method of Abortion (MMA) are highly effective for first-trimester termination, though MVA has a slightly higher success rate (98–99%) compared to MMA (95–97%) [11]. MVA also provides immediate confirmation of completion, whereas MMA occasionally results in incomplete expulsion requiring further intervention [12].

Patient experience differs: MMA offers privacy and avoids surgery, but is associated with heavier, longer bleeding and more cramping. MVA, by contrast, is a short in-clinic procedure (10–15 minutes) with less bleeding and controlled pain under local anaesthesia [14].

Both methods are very safe, MVA carries a minimal risk of uterine perforation or cervical trauma [19], while MMA requires follow-up to detect retained tissue [20]. Accessibility

also varies: MVA depends on trained providers and equipment, whereas MMA can be self-managed with proper counselling, making it valuable in low-resource settings [21]. This study aims to compare both methods in terms of efficacy, complications, and overall success, to support evidence-based clinical guidance and optimize patient centred reproductive care.

Materials and Methods

This hospital-based prospective randomized comparative study was conducted in the Department of Obstetrics and Gynaecology, SMS Medical College and its affiliated hospitals, Jaipur, to evaluate and compare manual vacuum aspiration (MVA) and the medical method of abortion (MMA) for termination of first-trimester pregnancies. The study began in July 2023 after obtaining administrative and ethical clearance, and data collection continued from October 2023 until the target sample size was achieved. A total of 120 pregnant women up to 9 weeks of gestation, who voluntarily sought termination and fulfilled the inclusion criteria, were enrolled after detailed counselling and written informed consent. Participants were randomized into two equal groups of 60 each: Group A received the medical method (200 mg mifepristone orally on Day 1 followed by 800 µg misoprostol vaginally at 48 hours with follow-up after 7–10 days), while Group B underwent manual vacuum aspiration under aseptic precautions with confirmation of procedure completeness by examining aspirated tissue. All Rh-negative women received anti-D immunoglobulin within 72 hours. Women with severe anemia, ectopic or molar pregnancy, uterine anomalies, genital infections, bleeding disorders, asthma, cardiac disease, or known allergy to study drugs were excluded. Procedure-related outcomes, including completeness of abortion, complications (pain, bleeding, fever, nausea, vomiting, incomplete abortion), and need for additional intervention, were assessed. Sample size was determined from prior studies to ensure adequate power, with 60 participants per group considered sufficient. Data were analysed using t-test for continuous variables and chi-square or Fisher's exact test for categorical variables, with $p < 0.05$ considered statistically significant. Ethical approval was obtained from the Institutional Ethics Committee, and confidentiality and patient autonomy were strictly maintained. The study was also guided by the provisions of the Medical Termination of Pregnancy (Amendment) Act, 2021, which expanded access to safe abortion care, revised gestational age limits, and reinforced confidentiality protections.

Results

The baseline demographic characteristics of women in both MTP and MVA groups were comparable. The mean age was 25.88 ± 5.82 years in the MTP group and 27.45 ± 6.15 years in the MVA group ($p = 0.12$). Most women belonged to the upper-middle socioeconomic class, with no significant difference between groups ($p = 0.63$). Religion, literacy, and area of residence were also similar, with Muslims forming the majority and nearly half of participants being illiterate. A higher proportion of women were from rural areas, and multigravida women predominated in both groups. None of these differences were statistically significant ($p > 0.05$), indicating that the groups were well matched for comparison. (Table I)

Table 1: Distribution of Patients by Demographic Characteristics in MTP and MVA Groups (n=120)

Variable	Categories	MTP (n=60)	MVA (n=60)	P-value
Age Group	<20 Years	9 (15.0%)	11 (18.3%)	0.12
	21–25 Years	27 (45.0%)	6 (10.0%)	
	26–30 Years	6 (10.0%)	17 (28.3%)	
	31–35 Years	12 (20.0%)	7 (11.7%)	
	>35 Years	6 (10.0%)	19 (31.7%)	
	Mean ± SD	25.88 ± 5.82	27.45 ± 6.15	
Socioeconomic Status	Lower Middle	20 (33.3%)	17 (28.3%)	0.63
	Upper Middle	39 (65.0%)	41 (68.3%)	
	Upper Lower	1 (1.7%)	2 (3.3%)	
Religion	Christian	1 (1.7%)	0 (0.0%)	0.37
	Hindu	23 (38.3%)	28 (46.7%)	
	Muslim	36 (60.0%)	32 (53.3%)	
Literacy	Higher Education	1 (1.7%)	1 (1.7%)	0.78
	Secondary Literacy	7 (11.7%)	9 (15.0%)	
	Primary Literacy	25 (41.7%)	20 (33.3%)	
	Illiterate	27 (45.0%)	30 (50.0%)	
Area of Residence	Rural	36 (60.0%)	34 (56.7%)	0.71
	Urban	24 (40.0%)	26 (43.3%)	
Parity	Multigravida	34 (56.7%)	37 (61.7%)	0.57
	Primigravida	26 (43.3%)	23 (38.3%)	

The mean duration of post-procedural bleeding was significantly longer in the MTP group (6.77 ± 3.73 days) compared to the MVA group (4.17 ± 2.57 days). This difference was statistically significant ($p = 0.0001$), indicating that medical termination of pregnancy is associated with a longer bleeding duration than manual vacuum aspiration. (Fig. I)

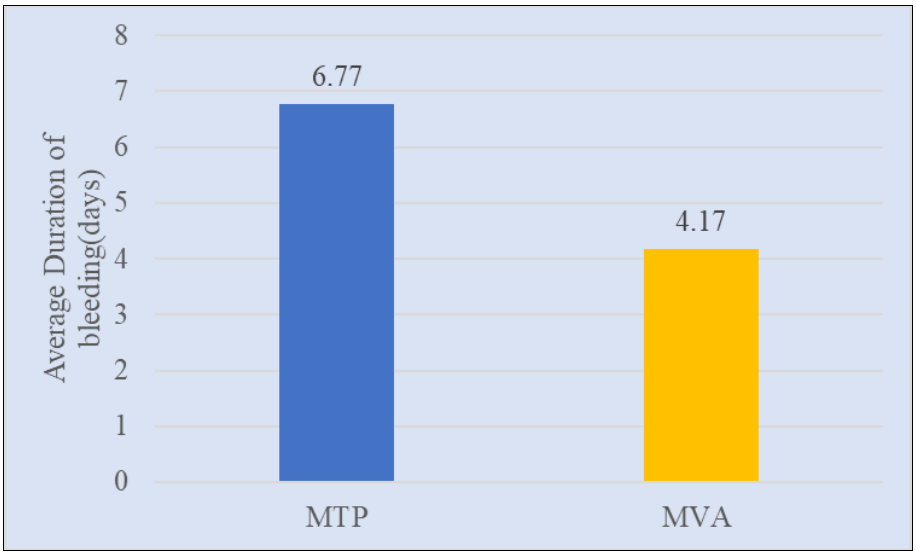

Fig 1: Graphical Comparison of Post-Abortion Bleeding Duration Between Study Groups

The incidence of complications was higher in the MTP group compared to the MVA group. Pain was the most common adverse effect, reported in 66.67% of women undergoing MTP versus 35.00% in the MVA group (p = 0.001). Nausea (36.67% vs. 13.33%) and vomiting (23.33% vs. 8.33%) were also significantly more frequent in the MTP group (p = 0.004 and p = 0.027, respectively). Other complications, including diarrhoea, fever, tiredness, and headache, occurred more often in the MTP group but the differences were not statistically significant (p > 0.05). Overall, MTP was associated with a higher incidence of gastrointestinal and discomfort-related side effects compared to MVA. (Fig. II)

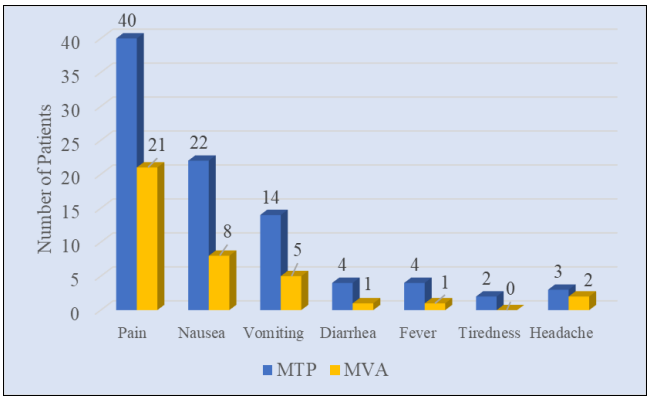

Fig 2: Graphical Comparison of Post-Abortion Complications Between MTP and MVA Groups

Table 2: Comparison of Success Rates Between MTP and MVA Procedures

Success rate	No. of Patients (%)	
	MTP	MVA
Complete	57(95.00)	60(100.00)
Incomplete	3(5.00)	0
Total	60	60
P-Value	0.243	

Complete abortion was achieved in 95% of MTP cases and 100% of MVA cases, with the difference not reaching statistical significance (p = 0.243). A small proportion (5%) of incomplete abortions occurred in the MTP group, requiring additional intervention. (Table. II)

Discussion

This prospective randomized comparative observational study was conducted in the Department of Obstetrics and Gynecology at SMS Medical College, Jaipur, to evaluate the safety, efficacy, and patient outcomes of Medical Pregnancy Termination (MTP) and Manual Vacuum Aspiration (MVA) up to 9 weeks of gestation. Random allocation minimized selection bias and enhanced the reliability of the results.

Sociodemographic Characteristics

The mean age of participants was 25.88 ± 5.82 years in the MTP group and 27.45 ± 6.15 years in the MVA group, with a combined mean of 26.67 ± 5.98 years, similar to previous studies by Garhwal *et al.* [25] and Dutta *et al* [17]. Younger women (<25 years) more frequently chose MTP, while those above 30 years opted for MVA, though the difference was not significant (p = 0.12). Socioeconomic analysis showed that most women belonged to the upper-middle class, with no significant variation between groups (p = 0.63). This reflects the hospital's patient pool and the role of government schemes like JSSY, Chiranjeevi Yojana, and Ayushman Bharat in improving access to maternal health services.

Religious distribution revealed that Muslims formed the majority, followed by Hindus, and a small proportion of Christians. No statistically significant difference in method preference was observed between groups (p = 0.37), consistent with studies by Begum *et al.* [18], Kumar *et al.* [19], and Srivastava *et al* [20], who noted that clinical eligibility and gestational age were the primary determinants rather than religious affiliation.

Educational status showed that most women were illiterate or had only primary-level education. Despite this, education did not significantly influence method preference (p = 0.78). Similar findings were reported by Begum *et al.* [18], Rani *et al.* [21], and Das *et al.* [22], who noted that structured counseling and provider guidance often outweigh literacy levels in determining abortion choices.

Most participants were from rural areas (MTP: 60%, MVA: 56.67%), with no significant rural–urban difference (p = 0.71). This supports earlier findings by Kumar *et al.* [19], Banerjee *et al.* [23], and Sundaram *et al.* [24], highlighting that decentralization and community-based distribution of medical abortion services reduce disparities between rural and urban populations.

Parity distribution showed that multigravida women were predominant in both groups (MTP: 56.67%, MVA: 61.67%), with no significant difference (p = 0.57). However, Garhwal *et al*. [25] reported that nulliparous women were more likely to opt for medical abortion, reflecting a preference for less invasive procedures in certain populations.

Gestational Age and Procedural Outcomes

Gestational age was similar between groups, with most procedures performed at 7–8 weeks, and no significant difference observed (p = 0.86). Our findings align with Garhwal *et al*. [25], Nayak R *et al*. [26], Shuchita K *et al*. [27], and Platais I *et al*. [28], all of whom reported that most abortions occurred between 6–8 weeks of gestation.

Complete abortion rates were slightly higher in the MVA group (100%) compared to the MTP group (95%), though the difference was not significant (p = 0.243). Similar results were reported by Garhwal *et al*. [25], Nayak RG *et al*. [26], Vinita D *et al*. [29], Zhang J *et al*. [30], and Rorbye C *et al*. [31], confirming both methods as highly effective, with MVA demonstrating marginally higher success.

Complications and Side Effects

Post-procedural bleeding was significantly longer in the MTP group (6.77 ± 3.73 days) compared to the MVA group (4.17 ± 2.57 days, p = 0.0001). This is consistent with Garhwal *et al*. [25] and Davis A *et al*. [29], who reported longer bleeding durations with medical abortion due to slower expulsion of products of conception.

Complications were also more common in the MTP group. Pain (66.67% vs. 35.00%, p = 0.001), nausea (36.67% vs. 13.33%, p = 0.004), and vomiting (23.33% vs. 8.33%, p = 0.027) were significantly higher with MTP. Similar findings were observed by Garhwal *et al*. [25], Nayak RG *et al*. [26], and Vinita D *et al*. [29]. Other symptoms like diarrhea, fever, and tiredness were more frequent in MTP but not statistically significant.

Clinical Implications

Both MTP and MVA are safe and effective for first-trimester termination. However, MVA showed advantages, including shorter bleeding duration, fewer systemic side effects, and slightly higher success rates. These findings suggest that MVA may be more suitable in resource-limited settings where follow-up care is difficult, while MTP remains a valuable non-invasive alternative when proper monitoring and support are available.

Overall, these results reinforce existing evidence that ensuring availability of both methods, coupled with proper counselling, empowers women to make informed reproductive choices and supports patient-centered care.

Study	Success Rate – Medical Abortion (%)	Success Rate – MVA (%)	Remarks
Present Study	95.65%	97.82%	4.34% of medical abortions required surgical curettage; 2 MVA cases needed re-curettage
Garhwal *et al*. [25]	95.65%	97.82%	Matches present findings; confirms high efficacy of both methods
Nayak RG *et al*. [26]	97.6%	100%	MVA showed slightly higher success
Vinita D *et al*. [29]	96.67%	96.91%	Comparable efficacy in both groups
Zhang J *et al*. [30]	84%	97%	Surgical method more effective
Rorbye C *et al*. [31]	94.1%	97.7%	MVA demonstrated higher success

Conclusion

Both manual vacuum aspiration (MVA) and the medical method of abortion are safe and effective for pregnancies up to 9 weeks. MVA demonstrated a slightly higher success rate and fewer complications, with less pain and discomfort compared to medical abortion. Although both methods remain viable, MVA may offer advantages in terms of completeness and patient comfort. Ultimately, the choice should be guided by patient preference, clinical suitability, and resource availability.

References

1. World Health Organization. Abortion care guideline. Geneva: WHO, 2022.
2. Kapp N, Whyte P, Tang J, et al. A review of evidence for safe abortion care. Contraception,2018:97(5):377-90.
3. Sedgh G, Bearak J, Singh S, et al. Abortion incidence between 1990 and 2014. Lancet,2016:388(10041):258-67.
4. Cleland K, Creinin MD, Nucatola D, et al. Significant adverse events and outcomes after medical abortion. Obstet Gynecol,2013:121(1):166-71.
5. Blumenthal PD, Voedisch A, Gemzell-Danielsson K. Strategies to prevent unsafe abortion. Int J Gynaecol Obstet,2014:125(2):190-4.
6. Winikoff B, Dzuba IG, Chong E, et al. Extending outpatient medical abortion services. Obstet Gynecol,2012:120(5):1070-6.
7. Goldstone P, Michelson J, Williamson E. Early medical abortion using low-dose mifepristone and buccal misoprostol. Contraception,2012:86(1):74-80.
8. Grossman D, White K, Harris L, et al. Continuing pregnancy after mifepristone and misoprostol. Obstet Gynecol,2015:126(1):47-55.
9. Fiala C, Cameron S. Home use of mifepristone for medical abortion. Best Pract Res Clin Obstet Gynaecol,2020:63:41-52.
10. Tedesco RP, Souza ASR, Borges L, et al. Comparison of misoprostol and manual vacuum aspiration for the treatment of early pregnancy failure: a randomized clinical trial. J Perinat Med. 2011;39(1):103-9.
11. Lohr PA, Fjerstad M, Desilva U, Lyus R. Abortion. BMJ Clin Evid,2014:2014:1407.
12. Kopp Kallner H, Gomperts R, Salomonsson E, et al. The efficacy, safety and acceptability of medical termination of pregnancy provided by standard care by general practitioners and by telemedicine: a non-inferiority randomized controlled trial. BJOG,2015:122(4):510-7.
13. Paul M, Lichtenberg ES, Borgatta L, et al., editors. Management of Unintended and Abnormal Pregnancy: Comprehensive Abortion Care. 1st ed. Chichester, UK: Wiley-Blackwell, 2009.
14. Goyal V. Uterine perforation and abortion. Curr Opin Obstet Gynecol,2009:21(4):337-41.

15. Upadhyay UD, Desai S, Zlidar V, et al. Incidence of emergency department visits and complications after abortion. Obstet Gynecol,2015:125(1):175-83.
16. Davis A, Hendlish SK, Westhoff C, Frederick MM, Zhang J, Gilles JM, et al. Bleeding patterns after medical and surgical abortion. Obstet Gynecol,2007:110(4):814–21.
17. Dutta BK, Samanta S. A comparative study between manual vacuum aspiration and electrical suction in first trimester MTP. The New Indian Journal of OBGYN,2018:4(2):154 – 57.
18. Begum S, Ahmed S, Das A. A comparative study of medical and surgical abortion up to 9 weeks of gestation. J Evid Based Med Healthc,2020:7(26):1226–9.
19. Kumar R, Sinha S, Roy S. Comparative evaluation of manual vacuum aspiration and medical abortion in early pregnancy termination. Int J Reprod Contracept Obstet Gynecol,2018:7(3):880–4.
20. Srivastava R, Gupta S, Bhatia P. Study of demographic profile and abortion-seeking behaviour among women attending a tertiary care hospital in North India. J Family Med Prim Care,2017:6(2):343–7.
21. Altijani N, Carson C, Choudhury SS, Rani A, Sarma UC, Knight M, et al. Stillbirth among women in nine states in India: rate and risk factors in study of 886,505 women from the annual health survey. BMJ Open,2018:8:022583.
22. Das R, Barman S, Bora B. Medical abortion versus manual vacuum aspiration: A comparative study of efficacy and complications in first trimester termination of pregnancy. Int J Reprod Contracept Obstet Gynecol,2017:6(5):1825–8.
23. Banerjee SK, Andersen KL, Warvadekar J, Pearson E. Effectiveness of a behavior change communication intervention to improve knowledge and perceptions about abortion and increase social support for women seeking abortion services in Bihar and Jharkhand, India. Glob Health Sci Pract,2013:1(3):311–20.
24. Sundaram A, Vlassoff M, Singh S, Onda T. Benefits of meeting the contraceptive needs of Indian women. Guttmacher Institute, 2014.
25. Maheshwari M, Garhwal S, Ishran R, Sharma R, Keswani P, Vyas AK. Comparative study of dyslipidemia in type II diabetes mellitus patients with and without associated hypothyroidism. Int J Acad Med Pharm,2023:5(4):333–6.
26. Nayak RG, Patil YS, Patil SK, NK. A comparison of manual vacuum aspiration with medical method of abortion in termination of pregnancy up to 9 weeks of gestational age. Int J Recent Trends Sci Technol,2015:13(3):490–4.
27. Shuchita M, Shveta K, Batya E, Suresh U. Simplifying medical abortion: home administration of misoprostol. J Obstet Gynaecol India,2008:58(5):410–6.
28. Platais I, Tsereteli T, Grebennikova G, Lotarevich T, Winikoff B. Prospective study of home use of mifepristone and misoprostol for medical abortion up to 10 weeks of pregnancy in Kazakhstan. Int J Gynaecol Obstet,2016:134(3):268–71.
29. Das V, Jain S, Gupta HP, Agarwal A, Sujata, Pandey A, et al. Evaluation of newer methods of early pregnancy termination up to 9 weeks of gestational age. Int J Reprod Contracept Obstet Gynecol,2017:6(9):3813–7.
30. Zhang J, Gilles JM, Barnhart K, Creinin MD, Westhoff C, Frederick MM, et al. A comparison of medical management with misoprostol and surgical management for early pregnancy failure. N Engl J Med,2005:353(8):761–9.
31. Rørbye C, Nørgaard M, Nilas L. Medical versus surgical abortion: comparing satisfaction and potential confounders in a partly randomized study. Hum Reprod,2005:20(3):834–8.