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RESEARCH ARTICLE

Comparative Efficacy and Safety of Mifepristone Plus Misoprostol, Cerviprime Plus Misoprostol, and Misoprostol Alone in Mid-Trimester Pregnancy Termination: A Retrospective Observational Study

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ABSTRACT

Background: Mid-trimester abortions, accounting for a significant proportion of abortion-related morbidity and mortality, require effective and safe medical management. While several regimens are available, including Mifepristone plus Misoprostol, Cerviprime plus Misoprostol, and Misoprostol alone, their comparative efficacy and safety remain crucial for optimizing patient outcomes during this critical period of pregnancy termination.

Aim and Objective: To compare the efficacy and safety of three different medical regimens—Mifepristone plus Misoprostol, Cerviprime plus Misoprostol, and Misoprostol alone—for mid-trimester termination of pregnancy.

Materials and Methods: This retrospective observational study was conducted at a tertiary care centre's Department of Obstetrics and Gynecology from May 2014 to June 2015. A total of 45 women between 13 to 20 weeks of gestation who met the inclusion criteria were divided into three groups: Group A received Mifepristone plus Misoprostol, Group B received Cerviprime plus Misoprostol, and Group C received Misoprostol alone. The primary outcomes measured were the induction-abortion interval, the need for oxytocin augmentation, and the rate of complete abortion. Secondary outcomes included side effects such as fever, nausea, vomiting, and diarrhoea.

Results: Group A (Mifepristone plus Misoprostol) had the shortest mean induction-abortion interval of 6.2 hours, compared to 9.4 hours in Group B (Cerviprime plus Misoprostol) and 8.5 hours in Group C (Misoprostol alone). The complete abortion rate was highest in Group A at 93.3%, followed by Group C at 80% and Group B at 66.7%. The need for oxytocin augmentation was lowest in Group A (20%), compared to Group B (33.3%) and Group C (40%). Group B reported the highest incidence of side effects, including fever, nausea, and vomiting.

Conclusion: Mifepristone plus Misoprostol is the most effective and safe regimen for mid-trimester abortion among the methods studied, offering the shortest induction-abortion interval, the highest complete abortion rate, and fewer side effects. Cerviprime plus Misoprostol, while effective, is less practical due to its higher side effect profile and the need for refrigeration. Misoprostol alone, though effective, requires longer induction-abortion intervals and more frequent oxytocin augmentation, making it less favourable compared to the combination regimen.

Keywords: Mid-trimester abortion, Mifepristone, Misoprostol, Cerviprime, Induction-abortion interval, Oxytocin augmentation, Medical abortion safety.

INTRODUCTION:

Abortion is defined as the spontaneous or induced termination of pregnancy before the fetus reaches viability. Unintended pregnancies continue to be a significant public health concern globally, with a large proportion of these pregnancies occurring in the first trimester.[1] However, there remains a subset of women who require termination in the second trimester due to various medical, social, or personal reasons.[2] Second-trimester abortions contribute significantly to maternal morbidity and mortality, making the choice of method critical for patient outcomes.[1, 2]

Globally, over 42 million abortions are performed annually, with 10-15% occurring in the second trimester.[3, 4] These later abortions are responsible for two-thirds of all major abortion-related complications. In India, approximately 15.6 million abortions were reported in 2015, highlighting the scale of the issue within the country.[3-5]

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Several factors contribute to the necessity of second-trimester abortions. These include late diagnosis due to irregular menstrual cycles, unrecognized pregnancies during lactational amenorrhea, detection of fetal anomalies through prenatal screening, and cases of missed abortion. [6] Additionally, certain social and financial conditions, as well as cases involving rape, also necessitate abortion in the later stages of pregnancy.[6, 7]

The methods for second-trimester abortion have evolved significantly over the past few decades. In the 1970s, techniques such as vacuum aspiration, dilatation and curettage, and intra-amniotic injections were commonly used but are now largely obsolete.[8] Currently, the most common regimens include Mifepristone followed by Misoprostol, Cerviprime gel followed by Misoprostol, and Misoprostol alone. These methods vary in their efficacy, safety profiles, and practical considerations, such as cost and storage requirements.[8, 9]

This study aims to evaluate the relative effectiveness and safety of these three regimens in inducing mid-trimester abortions, providing essential insights for optimizing patient care in this high-risk procedure.

Materials and Methods

This retrospective observational study was conducted in the Department of Obstetrics and Gynecology at Index Medical College, Hospital and Research Centre, Indore, between May 2012 and June 2013. The primary objective of the study was to compare the effectiveness and safety of three different medical regimens for mid-trimester abortion: Mifepristone plus Misoprostol, Cerviprime plus Misoprostol, and Misoprostol alone.

Study Population

The study included women who presented to Index Medical College and Research center for termination of pregnancy between 13 and 20 weeks of gestation. A total of 50 women were initially considered for inclusion in the study, but after applying the inclusion and exclusion criteria, 45 were included in the final analysis.

Inclusion Criteria

- Women with a gestational age between 13 and 20 weeks.
- Singleton pregnancies.
- Women who met the indications for medical termination of pregnancy (MTP) as per the MTP Act of India.

Exclusion Criteria

- Grand multipara (women who have given birth five or more times).
- Women who had taken MTP pills outside the hospital or had self-prescribed medication.
- Hemoglobin levels less than 8 g/dL.
- Women with known cases of heart disease, bronchial asthma, coagulation disorders, or any hypersensitivity to prostaglandins.
- Women with a history of previous cesarean section.
- Women on long-term corticosteroid therapy.

Group Allocation

The 45 women included in the study were divided into three groups based on the medical regimen they received for the termination of pregnancy:

- **Group A (Mifepristone + Misoprostol):** Women in this group received 200 mg of oral Mifepristone. After 48 hours, they were administered 400 µg of Misoprostol per vaginally. This dose was repeated every 6 hours, up to a maximum of three doses.
- **Group B (Cerviprime + Misoprostol):** Women in this group received 0.5 mg of prostaglandin E2 gel (Cerviprime) intra-cervically. After 6 hours, they were administered 400 µg of Misoprostol per vaginally, with the dose repeated every 6 hours, up to a maximum of three doses.
- **Group C (Misoprostol Alone):** Women in this group received 400 µg of Misoprostol per vaginally, with the dose repeated every 6 hours, up to a maximum of three doses.

Procedures and Interventions

- **Oxytocin Augmentation:** If required, an injection of oxytocin infusion was administered as a tocolytic agent to aid in uterine contractions and complete the abortion process.
- **Post-Abortion Management:** After the delivery of the abortus and placenta, an injection of 10 IU oxytocin was administered intramuscularly to prevent excessive bleeding. Prophylactic antibiotics were also given to reduce the risk of post-abortion infection.

Outcome Measures

- **Primary Outcome:** The primary outcome was the successful termination of pregnancy, defined as a

complete abortion within 18 hours of the first dose of Misoprostol.

- **Secondary Outcomes:** Secondary outcomes included the induction-abortion interval (the time from the administration of the first dose of Misoprostol to the complete abortion), the need for oxytocin augmentation, and the incidence of side effects such as fever, nausea, vomiting, diarrhoea, rigours, excessive bleeding, and the need for surgical intervention (check curettage).

Data Collection and Analysis

Data were collected retrospectively from patient records, including demographic details, gestational age, parity, the regimen used, induction-abortion interval, and any complications or side effects observed. The data were then analyzed to compare the effectiveness and safety profiles of the three regimens. Statistical analysis was performed using appropriate methods to assess the significance of differences between groups.

Results

Demographic Characteristics

A total of 45 women who met the inclusion criteria were included in the study. These women were divided into three equal groups based on the medical regimen used for mid-trimester abortion. Group A consisted of women who received Mifepristone plus Misoprostol, Group B received Cerviprime plus Misoprostol, and Group C received Misoprostol alone. The age distribution of the women across the three groups was relatively similar, with the majority of participants falling within the 26-30 years age range. Specifically, in Group A, the mean age of the women was 27 years, while in Group B, it was slightly higher at 29.2 years, and in Group C, it was 28.3 years.

Table 1: Age Distribution of Women

Age (Years)	Group A	Group B	Group C
12-25	5	5	4
26-30	7	6	7
31-35	2	3	2
> 35	1	1	2

Gestational Age

The mean gestational age at the time of the abortion was comparable across all three groups. For Group A, the mean gestational age was 17.4 weeks with a standard deviation (SD) of 2.5 weeks, while in Group B, it was 17.8 weeks (SD = 2.5 weeks), and in Group C, it was 17.1 weeks (SD = 2.5 weeks). Most women in all three groups were within the 13-18 weeks gestational age range, with only a few women having a gestational age of 19-20 weeks.

Table 2: Gestational Age Distribution

Gestational Age (Weeks)	Group A	Group B	Group C
13-15	6	6	7
16-18	5	6	6
19-20	4	3	2

Induction-Abortion Interval

The induction-abortion interval, which is the time from the administration of the first dose of Misoprostol to the complete abortion, was found to vary across the three groups. Group A, which received Mifepristone followed by Misoprostol, had the shortest mean induction-abortion interval of 6.2 hours. In this group, 60% of the women successfully aborted within 1-6 hours. In contrast, Group B, which received Cerviprime plus Misoprostol, had a longer mean induction-abortion interval of 9.4 hours. Group C, where only Misoprostol was used, had a mean induction-abortion interval of 8.5 hours. These results suggest that the pre-treatment with Mifepristone in Group A contributed to a faster induction-abortion process compared to the other regimens.

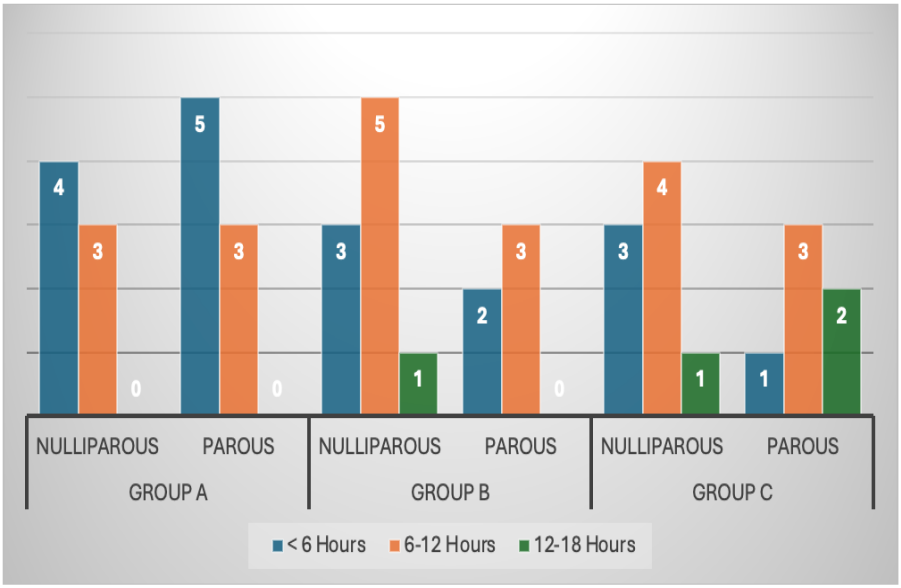

Figure 1: Induction-Abortion Interval

Parity and Induction-Abortion Interval

Further analysis was conducted to assess the relationship between parity (whether the women had previously given birth) and the induction-abortion interval. The data showed that the induction-abortion interval was generally shorter in parous women (those who had given birth before) across all groups. In Group A, parous women had a slightly shorter induction-abortion interval compared to nulliparous women (those who had never given birth), reinforcing the idea that prior pregnancies might influence the effectiveness of the abortion process.

Table 3: Parity and Induction-Abortion Interval

Duration (Hours)	Nulliparous	Parous
< 6	10	8
6-12	14	9
12-18	2	2

These results indicate that the choice of regimen and the parity of the woman can significantly impact the effectiveness and timing of the mid-trimester abortion process. The findings suggest that the Mifepristone plus Misoprostol regimen (Group A) is the most effective in reducing the induction-abortion interval, particularly in women who have had previous pregnancies.

Oxytocin Augmentation

The requirement for oxytocin augmentation during the abortion process varied across the three groups. In Group A, which received Mifepristone plus Misoprostol, oxytocin augmentation was required in only 3 out of 15 women (20%), while the majority (80%) did not need additional oxytocin. In contrast, Group B, which received Cerviprime plus Misoprostol, had a higher requirement for oxytocin, with 5 out of 15 women (33.3%) needing augmentation. Group C, which received Misoprostol alone, had the highest need for oxytocin augmentation, with 6 out of 15 women (40%) requiring this intervention. These findings suggest that the Mifepristone pre-treatment in Group A was more effective in preparing the cervix and inducing uterine contractions, thus reducing the need for additional oxytocin.

Table 4: Oxytocin Augmentation

Oxytocin Augmentation	Group A	Group B	Group C
Required	3	5	6
Not Required	12	10	9

Distribution of Cases as per Type of Abortion

The effectiveness of the three regimens was further assessed by examining the type of abortion achieved—complete, incomplete, or failed. In Group A, 14 out of 15 women (93.3%) had a complete abortion, with only 1 woman (6.7%) experiencing an incomplete abortion that required further surgical intervention. There were no cases of failed abortion in Group A. In Group B, 10 out of 15 women (66.7%) had a complete abortion, while 4 women (26.7%) had incomplete abortions and 1 woman (6.7%) experienced a failed abortion. Group C had a complete abortion rate of 80% (12 out of 15 women), with 2 women (13.3%) having incomplete abortions and 1 woman (6.7%) experiencing a failed abortion. These results highlight that the Mifepristone plus Misoprostol regimen (Group A) had the highest rate of complete abortions, making it the most effective regimen among the three.

Table 5: Distribution of Cases as per Type of Abortion

Type of Abortion	Group A	Group B	Group C
Complete Abortion	14	10	12
Incomplete Abortion	1	4	2
Failed Abortion	0	1	1

Discussion

This study aimed to compare the efficacy and safety profiles of three different regimens for medical termination of pregnancy in the mid-trimester: Mifepristone plus Misoprostol, Cerviprime plus Misoprostol, and Misoprostol alone. The results demonstrated that while all three regimens are effective, significant differences exist in terms of the induction-abortion interval, the need for oxytocin augmentation, and the rate of complete abortion.

The Mifepristone plus Misoprostol regimen (Group A) was found to have the shortest induction-abortion interval, with a mean of 6.2 hours, compared to 9.4 hours for Cerviprime plus Misoprostol (Group B) and 8.5 hours for Misoprostol alone (Group C). These findings align with previous studies, such as those by Bygdeman and Swahn [10], which highlight the role of Mifepristone in effectively blocking progesterone receptors, thereby priming the cervix and increasing the sensitivity of the uterus to Misoprostol-induced contractions. This mechanism likely accounts for the faster induction-abortion interval observed in Group A, making it a more efficient regimen for mid-trimester abortion.

In terms of the complete abortion rate, Group A also outperformed the other regimens, with a 93.3% success rate. This is consistent with findings from different studies, such as the one conducted by Farah Naz Mabud et al.[11], which also reported a high success rate with the combined use of Mifepristone and Misoprostol for mid-trimester abortions. The reduced need for oxytocin augmentation in Group A further supports the superiority of this regimen. Only 20% of women in Group A required oxytocin, compared to 33.3% in Group B and 40% in Group C. The need for oxytocin augmentation is an important consideration, as it can increase the complexity of the procedure and the risk of adverse outcomes.

The side effect profile also varied between the groups. Group B had a higher incidence of side effects such as fever, nausea, vomiting, and diarrhoea, which may be attributed to the combined use of Cerviprime and Misoprostol. This finding is consistent with previous literature, such as the study by Tanwar et al.[12], which highlighted the side effect burden associated with Cerviprime due to its dual mechanism of action. On the other hand, Group A had fewer side effects, suggesting that the Mifepristone plus Misoprostol regimen offers higher efficacy and a better safety profile.

The findings of this study also reflect broader trends observed in the literature. According to the Guttmacher Institute and other sources, the second trimester remains a critical period for abortion, accounting for a significant proportion of abortion-related morbidity and mortality globally.[4, 5, 8-12] The effectiveness and safety of the methods used in this period are therefore of paramount importance. The present study contributes to this body of knowledge by confirming that Mifepristone plus Misoprostol is the most effective and safe regimen among those studied, reinforcing its status as the preferred choice for mid-trimester abortions.

Conclusion

This study supports the use of Mifepristone plus Misoprostol as the most effective regimen for mid-trimester abortions. It offers a shorter induction-abortion interval, higher rates of complete abortion, and fewer side effects compared to Cerviprime plus Misoprostol and Misoprostol alone. These findings are consistent with existing literature and highlight the importance of

choosing the appropriate regimen based on clinical efficacy, safety, and practical considerations.

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):5-14.
2. Weeks A, Danielsson KG. Spontaneous miscarriage in the first trimester. BMJ. 2006 May 27;332(7552): 1223-4. doi: 10.1136/bmj.332.7552.1223.
3. Facts on Induced Abortion Worldwide. The Guttmacher Institute, New York, NY, USA; 2007.
4. Singh S, Prada E, Mirembe F, Kiggundu C. The incidence of induced abortion in Uganda. International Family Planning Perspectives. 2005;:183–191.
5. Gemzell-Danielsson K, Lalitkumar S. Second trimester medical abortion with mifepristone-misoprostol and misoprostol alone: a review of methods and management. Reprod Health Matters. 2008 May;16(31 Suppl):162-72. doi: 10.1016/S0968-8080(08)31371-8.
6. Wildschut H, Both MI, Medema S, Thomee E, Wildhagen MF, Kapp N. Medical methods for mid-trimester termination of pregnancy. Cochrane Database Syst Rev. 2011 Jan 19;2011(1):CD005216. doi: 10.1002/14651858.CD005216.pub2.
7. Lawson KL, Pierson RA. Maternal decisions regarding prenatal diagnosis: rational choices or sensible decisions? J Obstet Gynaecol Can. 2007 Mar;29(3):240-246. doi: 10.1016/S1701-2163(16)32412-4.
8. Gipson J, Koenig M, Hindin M. The Effects of Unintended Pregnancy on Infant, Child, and Parental Health: A Review of the Literature. *Studies in Family Planning*. 2008;39(1):18–38.
9. Kulier R, Fekih A, Hofmeyr GJ, Campana A. Surgical methods for first trimester termination of pregnancy. Cochrane Database Syst Rev. 2001;2001(4). Doi: 10.1002/14651858.CD002900.
10. Bygdeman M, Swahn ML. Progesterone receptor blockage effect on uterine contractility and early pregnancy. Contraception. 1985;32:45-51.
11. Joensuu-Manninen H, Kuvaja P, Talvensaari-Mattila A. Clinical efficacy of mifepristone and misoprostol in second trimester pregnancy termination. Acta Obstetricia Et Gynecologica Scandinavica. 2010;89(12):1552-1556. doi:10.3109/00016349.2010.513427
12. Lin CJ, Chien SC, Chen CP. The use of misoprostol in termination of second-trimester pregnancy. Taiwanese Journal of Obstetrics and Gynecology. 2011;50(3):275-282. doi:10.1016/j.tjog.2011.07.003

