



Original Research Article

Dilation and evacuation versus medication abortion at 15–24 weeks of gestation in low-middle income country: A retrospective cohort study^{☆,☆☆}

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ARTICLE INFO

Article history:

Received 8 April 2024

Received in revised form 9 July 2024

Accepted 5 August 2024

Keywords:

Abortion

Dilation and evacuation

Ethiopia

Later abortion

Low-middle income country

ABSTRACT

Objective: To compare the effectiveness and safety of dilation and evacuation (D&E) to that of medication abortion at 15–24 weeks in a low-middle income country.

Study design: We conducted a retrospective cohort on effectiveness and safety of D&E vs medication abortion at 15–24 weeks in an Ethiopian setting over a year (January 1–December 31, 2023). We looked at success (need for additional procedure) of both abortion procedures and their complication rates. Hemorrhage, infection, uterine perforation/rupture, and cervical tear were the complications we compared between the groups (D&E group vs medication abortion group). *P*-value less than 0.05 and Adjusted odds ratio (AOR) with 95% CI were used to present results significance.

Results: A total of 225 abortion cases (162 medication abortion cases and 63 D&E cases) at gestational age of 15–24 weeks were included in the final analysis. The mean gestational age was 18 ± 2.8 weeks in the D&E group compared to 21 ± 3 weeks in the medication abortion group (*p*-value < 0.001). The overall procedure effectiveness between the abortion procedures was similar (95.2% vs 96.9% in the D&E group and medication abortion groups, *p*-value = 0.542). D&E (AOR = 2.92 [95% CI = 0.62–13.69]) was not associated with increased overall complications compared to medication abortion, after controlling for parity, gestational age, and history of prior uterine scar.

Conclusion: We found both abortion methods (D&E and medication abortion) are effective with comparable complication rates.

Implications: D&E and medication abortion are safe and effective methods of abortion for gestations up to 24 weeks even in a low-middle income country (LMIC) setting; as such, greater resources are needed to ensure to increase availability of D&E in order for women to have a choice in their treatment options.

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1. Introduction

Second trimester abortion is a common procedure globally, constituting 10–15% of all induced abortions [1]. Both medication abortion and surgical abortion (dilation and evacuation) are safe and effective methods of abortion in this trimester of pregnancy [2]. In the US, dilation and evacuations (D&E) is more commonly practiced than medication abortion in the second trimester [3].

Level-I evidence supports utilization of medication abortion using the combined regimen (mifepristone–misoprostol) as a safe and an effective method of abortion for mid-trimester abortion [4,5].

In Ethiopia, medication abortion is the most common abortion procedure in the second trimester, that includes our center, St. Paul's Hospital Millennium Medical College. Second trimester D&E has been practiced at this center for the past 7 years, following the launch of family planning fellowship training at the hospital in 2017. The safety of this surgical procedure at our hospital has been documented in a recent retrospective study, which analyzed 242 second-trimester D&E cases and found an overall low rate of complications (8.3%, mostly incomplete abortion) [6]. This study compares the effectiveness and safety of D&E to that of medication abortion at 15–24 weeks in this tertiary center in Ethiopia.

[☆] Conflicts of interest: The authors report no conflicts of interest (financial or non-financial).

^{☆☆} Funding: No fund was received for this study.

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2. Methods

This was a retrospective cohort study on second trimester abortion at 15–24 weeks performed at St. Paul's Hospital Millennium Medical College (Ethiopia) over a year (from January 1 to December 31, 2023). St. Paul's Hospital is a leading teaching hospital in Ethiopia which provides a number of speciality and sub-speciality health services and trainings, including family planning. Currently, it is the only institution that provides family planning fellowship program in Africa. Five family planning sub-specialists have graduated from this fellowship program since its launching in 2017. Second trimester D&E up to 24 weeks has been practiced at this institution as an alternative method of second trimester abortion to second trimester medication abortion based on patients' preferences, and majority of the procedures are handled by family planning fellows.

In this study we compared abortions by D&E vs medication abortion in patients from 15–24 weeks. We included abortion patients managed with St. Paul's Hospital second trimester abortion protocol - D&E (Fig. 1) and medication abortion (Fig. 2) at 15–24 weeks of gestation with or without induced fetal demise, those with or without congenital anomalies, those with missed abortion, those with prior uterine scar (CS scar), and who are minors (age less than 18). Patients underwent D&E or medication abortion at 15–24 weeks based on their preference, after receiving a thorough counseling on both methods of abortion. We excluded those with molar pregnancy, obstetric emergencies (e.g., preeclampsia/eclampsia), incomplete clinical data, and those who received post-abortion care. Outcomes were effectiveness and complications. Effectiveness was defined as no need for further procedure or intervention. Complications were defined as hemorrhage, incomplete abortion, infection, cervical tear, and uterine perforations. We defined hemorrhage as clinically significant blood loss evidenced with a clinical response such as transfusion or admission, and/or bleeding in excess of 500 mL. We defined infection as new occurrence of chills, fever, sweat, or a foul-smelling vaginal discharge with or without evidence of infection on complete blood count (CBC) profile (elevated white blood cells (WBC) count with left shift) within 24 hours to 3 weeks after completion abortion procedures.

Data were collected by reviewing medical records of patients who had abortion (medication abortion or D&E) during the study

period. No specific sample size calculation was applied. We used a data extraction form prepared in English to extract the data. We employed systemic sampling (in which every three case was selected) to recruit second trimester medication abortion cases while all second trimester D&E cases based on the inclusion and exclusion criteria were included. Ethical clearance was obtained from St. Paul's Hospital Millennium Medical College Institutional Review Board (IRB) and the requirement for obtaining informed consent from the study subjects was waived by this ethics committee. Data were analysed using SPSS version 26. Chi-Squared test, Fisher-exact, and multivariate regression analysis were performed as appropriate. *P*-value less than 0.05 and adjusted odds ratio (AOR) with 95% CI were used to present results significance.

3. Results

After excluding 62 cases due to incomplete data, 225 abortion cases (162 medication abortion and 63 second-trimester D&E) at 15–24 weeks of gestation were included in the final analysis. There was a significant difference in the distribution of gestational age between the abortion methods (Table 1). The mean gestational age was 18 ± 2.8 weeks compared to 21 ± 3 weeks in the medication abortion group (*p*-value < 0.001). Fifty-one (81%) cases in the D&E group were at 15–20 weeks while 48.1% (78/162) were at this gestational age category in the medication abortion group, *p*-value < 0.001. More cases in the D&E group had prior uterine scar than in the medication abortion group (15.9% vs 0.6%, *p*-value < 0.001). There was no difference in the distribution of parity between the groups.

All second trimester D&E were performed on the planned date of procedure without further requirement of additional day of cervical preparation, with mean D&E operation time being 22.5 ± 6.8 minutes. Three patients in the D&E group were complicated by hemorrhage, infection, and cervical tear, respectively, constituting 1.6% each of the total, while there were none of these complications in the medication abortion group. There were three encounters of incomplete abortion in both groups (3/63, 4.8% in the D&E group vs 3/162, 1.9% in the medication abortion group). The overall method effectiveness was similar between the groups (95.2% vs 96.9% in the D&E group and medication abortion groups, respectively, *p*-

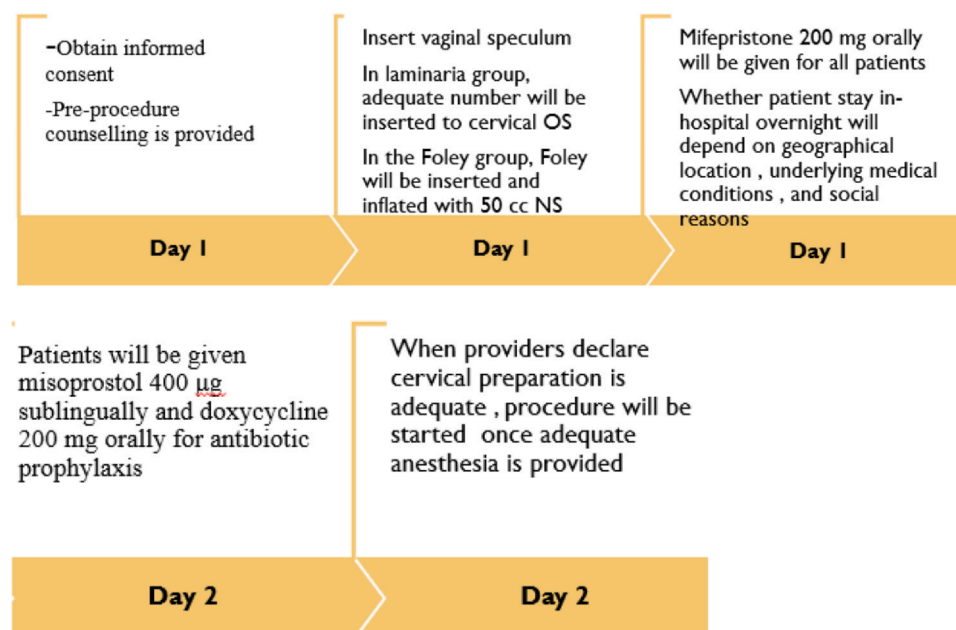
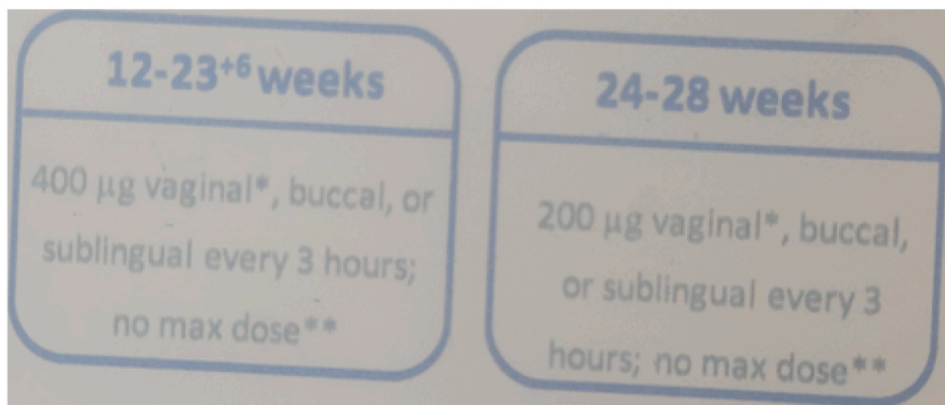


Fig. 1. St. Paul's Hospital second trimester dilation and evacuation (D&E) protocol.

A. Combined regimes (Mifepristone 200 mg orally given 1-2 days prior to initiation of misoprostol)



B. Medical regimen for women with prior uterine scar

Gestational age	Number of prior uterine scar	
	One prior uterine scar	Two or more prior uterine scar
< 20 weeks	Misoprostol 400 µg V/S/B* every 3 hours	Misoprostol 200 µg V/S/B* every 3 hours
20-24 weeks	Misoprostol 400 µg loading dose followed by 200 µg V/S/B* every 3 hours	Misoprostol 200 µg loading dose followed by 100 µg V/S/B* every 3 hours
24-28 weeks	Misoprostol 200 µg loading dose followed by 100 µg V/S/B* every 3 hours	Misoprostol 100 µg loading dose followed by 50 µg V/S/B* every 3 hours

*V-vaginal, S-sublingual, B- buccal

C. Management of failed medication abortion

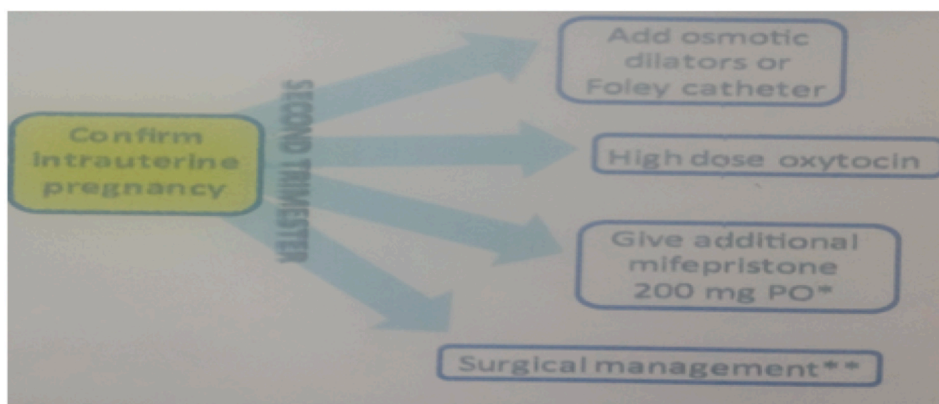


Fig. 2. St. Paul’s Hospital safe second trimester medication abortion protocol.

Table 1
Comparison of second trimester D&E procedures with second trimester medication abortion procedures at 15–24 weeks in Ethiopia, 2023

Variable	Category	Abortion method				p-value
		D&E (N=63)		Medication abortion (N=162)		
		n	%	n	%	
Maternal age (years)	Mean	25 ± 5.4		23 ± 4.6		<0.001
Gestational age (weeks)	Mean	18 ± 2.8		21 ± 3		<0.001
	≤20	51	81.0	78	48.1	
	21–24	12	19.0	84	51.9	
Parity	Nulliparous	36	57.1	112	69.1	0.089
	Parous	27	42.9	50	30.9	
Have prior uterine scar	No	53	84.1	161	99.4	<0.001
	Yes	10	15.9	1	0.6	

D&E, dilation and evacuation.

Table 2
Second trimester safe abortion procedures outcomes in Ethiopia, 2023

Outcome	Category	D&E		Medication abortion		p-value
		n	%	n	%	
Complications	Overall	6	9.5	5	3.1	0.044
	Incomplete abortion	3	4.8	3	1.9	
	Infection	1	1.6	0	0	
	Hemorrhage	1	1.6	0	0	
	Cervical laceration	1	1.6	0	0	
	Failed abortion method	0		1	1.2	
Method effectiveness	Overall	60	95.2	157	96.9	0.542

D&E, dilation and evacuation.

Table 3
Factors associated with second trimester abortion complications in Ethiopia, 2023

Variable	Category	AOR (95% CI)
Maternal Age	≤18 years	1.98 (0.35–11.15)
	19+ years	ref
Gestational Age	≤20 weeks	ref
	21+ weeks	1.66 (0.41–6.57)
Parity	Nulliparous	1.06 (0.22–4.99)
	Parous	ref
Have prior uterine scar	No	ref
	Yes	6.05 (0.87–41.66)
Abortion method	D&E	2.92 (0.62–13.69)
	Medication Abortion	ref

AOR, adjusted odds ratio; D&E, dilation and evacuation; ref, reference.

value = 0.542). The overall complication rate was 9.5% in the D&E group which is higher than 3.1% in the medication abortion group, p -value = 0.044 (Table 2). However, after controlling for parity, gestational age, and history of prior uterine scar (Table 3), D&E (AOR = 2.92 [95% CI = 0.62–13.69]) was not associated with increased overall complications compared to medication abortion.

4. Discussion

In this study, D&E and medication abortion performed at 15–24 weeks had comparable effectiveness and safety. Both procedures had above 95% effectiveness with few complications, mainly incomplete abortion, with no association between specific abortion method and abortion complications.

Today, there is convincing line of evidence from cohort and randomized controlled studies on the safety and effectiveness of D&E for second trimester abortion [7], and should be provided to women as an option with comparable safety and effectiveness to that of medication abortion, that includes for those pregnant women with congenital anomalies and missed abortion [8,9]. It is stated that D&E has two prerequisites: an open cervix and an open mind. The uneven geographical availability of D&E today implies that the latter prerequisite is the more difficult to achieve [10]. Medication abortion continues to be the most common second trimester abortion method in low-middle income countries (LMICs), including in Ethiopia, which is contrary to the situation in some high-income countries, for instance D&E constitutes more than 95% second trimester abortion procedures in United States [11]. This is largely due to the fact that D&E is not readily available as an abortion method across these LMICs. For example, in Ethiopia, D&E at advanced gestational age 15–24 weeks is exclusively provided in our center (St. Paul's Hospital Millennium Medical college) and we receive high number of abortion clients referred for this surgical procedure from other centers within Ethiopia.

The present study found above 95% effectiveness of both abortion methods-D&E and medication abortion at gestational age of 15–24 weeks. These results are similar to findings of a previous similar study done in Ethiopia which demonstrated no difference in safety between surgical and medical methods of abortion at 13–20 weeks.

The composite complication rate was not significantly different among medical and surgical abortion patients (15% vs 10%; $p = 0.52$) with nine (4.1%) in the medical arm required additional intervention to complete the abortion, while none of the surgical abortion patients required additional intervention [12]. Contrary to the results of our study, a study done in Nepal in which 75 second-trimester medication abortion cases were compared with 66 similar cases that underwent D&E found superior results of D&E over medication abortion in terms of effectiveness and safety (20% vs 6% overall complications and 13% vs 0% incomplete abortions in medication abortion and D&E groups, respectively, $p < 0.001$) [13]. Likewise, another study from South Africa, which compared 220 women undergoing second-trimester D&E to 84 women undergoing second trimester medication abortion found second trimester D&E was more effective (99.5% vs 50.0% of cases completed on-site without unplanned surgical procedure in the D&E case and medication abortion cases respectively, $p < 0.001$) than medication abortion [14].

The higher rates of incomplete abortion in the previous studies may be explained by the different medication abortion protocol utilized in those studies (Misoprostol dosing frequency 400 mcg orally every four hours in the study from South Africa and misoprostol 400 mcg vaginally or sublingually every 4 hours in that from Nepal). Thus, the very low rate of incomplete abortion (3/162, 1.9%) associated with medication abortion in our study is of a notable importance, as it indicates this high effectiveness of our medication abortion protocol for later abortion, which may be adopted for practice in other LMICs.

Strengths of our study include our study setting being in a low-middle income country, where second trimester D&E procedures are not routinely provided as an alternative method of second trimester abortion to women seeking abortion care at an advanced gestation 15–24 weeks. The other strength is the use of the most recently recommended and more effective medication abortion regimen in our study, which is different from the regimens utilized in previous studies. The main limitations of the study are lack of analysis of total hospital stay and patient acceptability of the abortion methods, which are due to the retrospective nature of the study. Including all cases of medication abortion without systemic sampling would have given our study a larger sample size with stronger results.

In summary, our study supports that in low-middle income settings, both D&E procedures and medication abortion up to 24 weeks of gestation can be provided with similar effectiveness and safety. Greater resources are required to ensure to increase availability of D&E in order for women to have a choice in their treatment options in these settings.

Ethical consideration

Formal Ethical clearance letter was obtained St. Paul's Hospital Millennium Medical College. The ethical clearance did not require us to obtain informed consent from the study subjects in the quantitative component of this study.

Author contributions

A.F.S. contributed conception and development of the study design. A.F.S., Z.B., and A.N. contributed data collection and data analysis. A.F.S., Z.B., and A.N. contributed data interpretation and manuscript write up. The final manuscript was edited by A.F.S. All authors critically revised the article for intellectual content. All authors reviewed the final manuscript and approved its submission.

Declaration of Competing Interest

None.

Acknowledgments

The authors would like to acknowledge the department of Obstetrics and Gynecology at St Paul's Hospital Millennium Medical College (Ethiopia).

Data availability statement

All data generated or analyzed during this study are included in this published article.

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