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RESEARCH ARTICLE

Sublingual vs. vaginal misoprostol for cervical preparation before surgical abortion in the first trimester

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ABSTRACT

Background: Suction evacuation is the most common surgical method of first-trimester pregnancy termination and cervical dilatation is the most critical step. Misoprostol is increasingly being used as a cervical priming agent before suction evacuation although the ideal dosage and route of administration is not yet agreed upon**. Objective**: The present study aimed to compare the efficacy, side effects and acceptability of the sublingual vs. vaginal route of administration of misoprostol**. Methodology**: 120 women seeking first-trimester termination of pregnancy between 6 to 12 weeks of gestation were randomized to receive 400mcg of misoprostol either sublingually or vaginally. Women in the two groups were comparatively evaluated for cervical dilatation before a surgical abortion, operative blood loss, time duration of surgery, adverse effects and overall satisfaction with the route of administration. **Result**: Successful dilatation of more than 8mm was achieved in 41(68.3%) women in the sublingual group and 23(38 %) in the vaginal group ($p<0.01$). The mean cervical dilatation of 8.25 mm for the sublingual group was significantly higher than the 7.4 mm cervical dilation achieved in the vaginal group at two hours. The mean blood loss was 14.5 ml in group I and 14.63 in group II (p 0.32). The mean duration of the procedure was 4.09 minutes in group I and 4.57 minutes in group II (p 0.06). Side effects like nausea, diarrhoea, bleeding per vaginum and pain abdomen were significantly more with the sublingual route. Patient acceptability was high for the sublingual route (88%) as compared to the vaginal route (43%) ($p<0.0001$). **Conclusion:** Sublingual misoprostol is a more effective cervical priming agent as compared to vaginal misoprostol for first-trimester pregnancy termination by suction evacuation. Though side effects are more, they are mild and manageable. It also has good patient acceptability and ease of administration.

Keywords: Cervical ripening, misoprostol, suction evacuation.

According to WHO, 25% of all pregnancies end in induced abortion. This implies that around 56 million induced abortions occur worldwide each year. This includes both safe and unsafe termination of pregnancy [1]. The rate of abortions is higher in developing countries like India. It is estimated that around 25 million unsafe abortions take place each year, almost all in developing countries [2]. It is estimated that 4.7% - 13.2% of maternal deaths can be attributed to unsafe abortion [3].

Surgical abortion by suction evacuation is a safe daycare surgery. Optimal cervical priming before suction evacuation in the shortest time interval, with minimum side effects is desirable. Over the years, many methods of cervical ripening have been proposed. Prostaglandin analogues have a well-established role as cervical priming agents before first-trimester suction evacuation.

In various studies, misoprostol, a synthetic prostaglandin E-1 analogue is found to be a better alternative to the other prostaglandin preparations. Misoprostol can be administered in many routes like sublingual, vaginal, oral, buccal, and rectal. The absorption of misoprostol when given sublingually is as rapid as that observed following oral treatment, and peak plasma levels are reached significantly faster than following vaginal administration [4]. Vaginally

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administered misoprostol results in a slower uptake and fewer side effects compared with sublingual administration [5]. However, in daycare procedures like suction evacuation, a faster effect as seen in the sublingual route is preferred. Ease of administration and privacy issues in crowded government hospitals like ours make oral and sublingual routes of administration more acceptable to the woman than the vaginal route [6].

The ideal route of administration, dose, and dosage time interval of misoprostol for cervical ripening before a surgical abortion is yet to be determined. The current study was undertaken to comparatively evaluate the efficacy and patient acceptability of sublingual vs. vaginal misoprostol 400mcg administered in the hospital two hours before suction evacuation.

Materials and methods

The present study was carried out in the Department of Obstetrics and Gynecology at Dr Baba Saheb Ambedkar Hospital from July 2014 to June 2015. 120 women seeking first-trimester termination of pregnancy in the age group of 20-40 years with a gestational period of 6 to 11 weeks were included in the study

Exclusion criteria - Women with known allergy to misoprostol, previous uterine surgery, haemoglobin less than 9 gm%, lUCD in situ, uterine anomaly, threatened or missed abortion, a chronic medical disorder like hepatic, renal, or cardiac disease, bronchial asthma, or genital infection, and women, in whom suction evacuation got delayed beyond two hours.

A complete history, physical, per abdomen, per speculum, and bimanual pelvic examination was performed and recorded on the performa. The period of gestation was determined by a last menstrual period and confirmed by pelvic examination. Ultrasonography was advised when any discrepancy between the two was found, or if the size of the uterus was difficult to assess.

A written and informed consent for the study was taken and Form I and Form C, as per the MTP act was filled.

Patients were divided by simple randomization, into two groups.

1. Group I: Women received sublingual misoprostol 400 mcg two hours before suction evacuation.

2. Group II: Women received misoprostol 400 mcg vaginally in the posterior fornix two hours before suction evacuation.

The route of administration of misoprostol was known to the patient and the investigator, but the surgeon was blinded. No premedication was given but the woman was told that should they experience pain, analgesics were available. The same clinician performed the suction evacuation to reduce bias.

Preoperatively, side effects associated with misoprostol including pain, nausea, vomiting, diarrhoea, giddiness, fever, shivering and vaginal bleeding were recorded.

A suction evacuation was performed under intravenous sedation. Cervical dilatation was measured with Hegar's dilator using sequentially smaller dilators until a dilator entered the internal os easily without resistance and the size of the largest dilator that could be passed into the cervical os without resistance was recorded. In patients with insufficient dilatation serial dilatation was done using Hegar's dilator.

The duration of surgery was measured from the start of dilatation until the end of curettage. Intra-operative fluid loss is measured with a graduated cylinder as the volume of total uterine aspirate, after sieving away the product of conception. The appropriate amount of liquor for that period of gestation was subtracted. Any cervical or uterine injuries were noted. IUCD insertion or sterilization was performed as desired by the patient. Postoperative side effects like nausea, vomiting, vaginal bleeding, fever, dizziness, diarrhoea, bad taste, and shivering were noted. Women were asked to fill out the patient satisfaction questionnaire before discharge. Outcome measures of the study were: Cervical dilatation before suction evacuation, operative blood loss, operative time and pre and post-operative adverse effects related to misoprostol and patient satisfaction. The study had instituted ethical and scientific approval.

The SPSS software package version 15.0 was used for all calculations. The quantitative variables that are normally distributed were analyzed with the one-way ANOVA test and those not followed normal distributions were analyzed with the Kruskal-Wallis test. For comparing quantitative variables between two groups that are normally distributed were analyzed with a t-test and those not following normal distribution were analyzed with the Mann-Whitney test. Chi-square was applied for qualitative outcome variables. P value < 0.05 was considered significant.

Result

The age distribution, gravidity, parity, and number (no) of previous living children and abortions were comparable in both groups. The majority of women in both groups were illiterate and belonged to a lower socio-economic group. The predominant religion reported was Hinduism (table 1).

Successful dilatation was achieved in 41(68.3%) women in Group I and 23(38 %) in Group II and the difference was statistically significant. The mean cervical dilation was 8.25 mm in group I and 7.4 mm in group II and the difference was statistically significant. The mean blood loss was 14.5 ml in group I and 14.63 (±5.15 ml) in group II which was not statistically significant. The mean duration of the procedure was 4.09 minutes in Group I and 4.57 minutes in Group II and the difference was not statistically significant (table 2).

Table 1: Demographic profile of the two groups

Variables	Group I	Group II	P value*
Age in years	28.35±3.72	28.27±4.43	0.98
Gravidity	4.20± 1.16	3.87 ± 0.88	0.18
Parity	2.82 ± 0.75	2.70 ± 0.75	0.47
No living children	2.81 ± 0.751	2.70 ± 0.758	0.61
No previous abortions	0.25 ± 0.748	0.18 ± 0.501	0.44
illiterate	31(51.5%)	39(65%)	0.14
Low socioeconomic status	43(71.7%)	36(58.3%)	0.18
Religion (% of Hindus)	45(75%)	42(70%)	0.54

* t-test and chi-square test

Table 2: Clinical Outcome parameters in the two groups

Parameters	Group I	Group II	P value*
Successful dilatation (No./%)	41(68.3%)	23(38%)	<0.01
Cervical dilation (mm) Mean ± S.D	8.25 ± 1.75	7.4±1.37	<0.01
Blood loss (ml) Mean ± S.D	14.50 ±4.85	14.63 ±5.15	0.909
Duration of procedure (min) Mean ± S.D	4.09 ± 1.45	4.57 ±1.35	0.06

*chi-square test

In group I, 10 (16.7%) had nausea, 3(5%) had vomiting, 7(11.6%) had diarrhoea, 3 (5%) had giddiness, 2 (3.3%) had a fever, 4 (6.7%) had shivering, 11(18.3%) had spotting and 16 (26.7%) had mild pain in the abdomen. In group II, 3 (5%) had nausea, 2(3.3%) had giddiness, 2 (5%) had shivering and 10 (17.5%) had pain in the abdomen. The p-value was statistically significant for nausea, diarrhoea and vaginal bleeding. However, bleeding was mild and none of the women expelled products of conception before evacuation (table 3).

Table 3: Preoperative side effects

Side effects	Group I		Group II		P value*
	No	%	No	%	
Nausea	10	16.7	3	5	0.04
Vomiting	3	5	0	0	0.15
Diarrhoea	7	11.6	1	1.7	<0.01
Giddiness	3	5	2	3.3	0.64
Fever	2	3.3	0	0	0.31
Shivering	4	6.7	3	5	0.89
Bleeding	11	18.3	2	3.3	0.02
Pain	16	26.7	10	17.5	0.28

* chi-square test

In group I, 35 (58.3%) had nausea, 14 (23.4%) had vomiting, 16 (26.7%) had heavy bleeding per vagina and 15 (25%) had moderate to severe pain in the abdomen. In group II, 17 (28.3%) had nausea, 7(11.7%) had vomiting, 1 (1.7%) had shivering, 11 (18.3%) had heavy vaginal bleeding, and 11 (18.3%) had pain in the abdomen. Nausea and pain abdomen were significantly more in group I (table 4).

Table 4: Post-operative side effects

Side effects	Group I		Group II		P value*
	No	%	No	%	
Nausea	35	58.3	17	28.3	0.01
Vomiting	14	23.4	7	11.7	0.15
Shivering	1	1.7	1	1.7	0.31
Heavy Bleeding	16	26.7	11	18.3	0.30
Pain	15	25	11	18.3	0.04

* chi-square test

Of the women in the sublingual group 49 (81.6%) were satisfied with the priming method used, 2 (3.3%) women did not comment and 9(15%) were dissatisfied. In the vaginal group, 26 (42.4%) were satisfied, 7(11.6%) did not comment and 33(45%) were dissatisfied (p<0.0001). 45(75%) women in the sublingual group would use the sublingual priming agent again if they had an abortion compared to 19(31.6%) in the vaginal group (p<0.001). 42 women in the sublingual group would recommend it to a friend.

Discussion

Suction evacuation is a commonly used method for first-trimester abortion and is one of the most common surgical procedures performed worldwide. Cervical dilatation before suction evacuation is probably the most critical step in the first-trimester termination of pregnancy. To avoid tissue damage and other unwanted effects, the dilatation procedure must be carried out with considerable caution. Adequate dilatation decreases pain and the duration of surgery and increases operative ease. Misoprostol, an orally active prostaglandin E1 analogue with the additional advantage of easy availability, ease of administration, lower cost, stability at room temperature, and fewer side effects is an effective cervical priming agent. More evidence from large randomized studies is needed to add to best practice guidelines regarding the optimal dose, time interval, and route of administration of misoprostol for pre-abortion cervical priming.

In the present comparative study of sublingual with vaginal misoprostol for cervical priming before first-trimester suction evacuation, 41(68.3%) of the 60 women who received 400 microgram misoprostol sublingually achieved successful cervical dilatation of 8 mm, compared to 23(37%) of the 60 women who received 400 microgram misoprostol vaginally. The mean cervical dilatation of 8.25 mm for the sublingual group was significantly higher than the 7.4 mm cervical dilation achieved in the vaginal group. Saav et al [7], Tang et al [8] and Vimla et al [9] found that sublingual misoprostol produced significantly greater cervical dilatation than vaginal misoprostol, a finding similar

to our study. However, in some other studies, no statistically significant difference was found in the cervical dilatation with the two routes [10-12]. The difference in mean intra-operative blood loss and the duration of the procedure in the two groups was not statistically significant in the present study. This was similar to the findings of Calliskan et al [10] and Carbonell et al [13]. In contrast, the average time required for the procedure was significantly less in some of the previous studies [9, 14]. All preoperative side effects nausea, vomiting, diarrhoea, fever, shivering, bleeding and pain were higher in the sublingual group and the difference was statistically significant in cases of nausea (17% vs 5%), diarrhoea (12% vs 2%) and bleeding per vaginum (18% vs 3%). Postoperative side effects like nausea (58% vs 28%) and moderate to heavy pain in the abdomen (25% vs 11%) were significantly higher in the sublingual group in comparison to the vaginal group. Tang et al [8] noted that side effects experienced by the women like nausea (20% vs.16.7%), dizziness (9% vs. 5%), spotting (30% vs 18.3%), and abdominal pain (55% vs.26.7%) were significantly higher in their sublingual group.

In the study by Parveen et al [12] abdominal pain was observed in all three groups while vaginal bleeding was more in the vaginal, loose motion in the oral and nausea, and vomiting with gastrointestinal adverse effects were more in the oral and sublingual groups. Saav et al [7] found that sublingual administration was associated with a higher incidence of abdominal pain before surgery compared with vaginal administration ($p = 0.001$). Saxena et al[14] found that sublingual administration reduced the time duration of surgery ($p < 0.001$) compared to the vaginal group without increasing the side effects which was not corroborated in the present study.

Patient acceptability was high for the sublingual route (88%) as compared to the vaginal route (43%) probably because it avoids cumbersome vaginal examination. This was corroborated in the study by Saxena et al [14] who reported higher patient acceptability for the sublingual route than the vaginal route (94% versus 36%).

Study limitations - The sublingual route of administration is a newer, more effective route for misoprostol administration as compared to the vaginal route though it has more side effects. However, a larger randomized controlled trial is required to validate the findings of the present study and to formulate treatment guidelines.

Conclusion

Sublingual misoprostol is a more effective cervical priming agent as compared to vaginal misoprostol for first-trimester pregnancy termination by suction evacuation. Though side effects are more, they are mild and manageable. It also has good patient acceptability and ease of administration.

Conflict of interest: None. **Disclaimer:** Nil.

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