

CERVICAL PRIMING PRIOR TO FIRST TRIMESTER SUCTION EVACUATION: COMPARATIVE STUDYSantoshi Prabhu¹, Veena Aurangabadwalla², Amrita Misri³**HOW TO CITE THIS ARTICLE:**

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ABSTRACT: BACKGROUND: Suction evacuation is widely used method for elective termination of pregnancy in first trimester. The step of mechanical cervical dilatation during this procedure is probably the most critical step. Difficult cervical dilatation may cause incomplete evacuation, cervical laceration, and uterine perforation. Prior cervical priming with pharmacological agents like prostaglandin derivatives although not free from side effects, makes the procedure easier with reduced overall complication rate, and hence recommended in several guidelines. **AIM:** We compared, two prostaglandin derivatives, sublingual Misoprostol (15-deoxy-16hydroxy-16-methylprostaglandinE₁) with intramuscular Carboprost (15-methylProstaglandinF₂α.) for cervical priming prior to suction evacuation in first trimester termination of pregnancy. **SETTINGS AND DESIGN:** Prospective study was conducted at tertiary care institute in Mumbai. **METHODS:** Eighty women requesting pregnancy termination from 6th to 12th weeks gestation were randomized in two groups. Two hours prior to suction evacuation, first group (N=40) received 400 µg of sublingual Misoprostol, while second group (N=40) received 250µg of intramuscular injection Carboprost. Outcomes of both groups were recorded in terms of baseline cervical dilatation, immediate complications, drug induced side effects and patient acceptability by questionnaire. **STATISTICAL ANALYSIS:** Performed by SPSS Inc, Version 15, Continuous variables were compared using ttest/ANOVA. Categorical variables were compared by Chi- Square test or Fisher exact test. Probability value <0.05 was considered statistically significant. **RESULTS:** Mean baseline cervical dilatation prior to suction evacuation was 7.645±/-1.20mm in the Misoprostol group and 7.724±/-0.64mm in the Carboprost group (P>0.05). 42.5% women in Misoprostol group had cervical dilatation >8mm, compared to 17.5% in Carboprost group (P=0.004). The side effects including nausea, vomiting and abdominal cramps were more in Carboprost group as compared to Misoprostol group. No patient had diarrhea in Misoprostol group as against 32.5% in Carboprost group (P<0.0001). There were no complications like incomplete evacuation, cervical lacerations or uterine perforation noted in either group. **CONCLUSION:** Cervical priming prior to suction evacuation results in easier dilatation reducing the incidence of complications. Sublingual Misoprostol appears to be more effective with minimal side effects hence, easily acceptable alternative as compared to intramuscular Carboprost.

KEYWORDS: Suction Evacuation, Cervical Priming, Sublingual Misoprostol, Intramuscular Carboprost, Baseline cervical dilatation.

MESH TERMS: Vacuum curettage, Sublingual Misoprostol, Intramuscular Carboprost.

INTRODUCTION: Surgical evacuation of the uterus is an integral part of obstetric care. In many countries, suction evacuation is the widely used method for elective termination of pregnancy in first trimester. Worldwide, around 28 per 1000 women opt for elective abortions annually. 49% of these

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abortions are unsafe.¹ In India, after liberalization of MTP act 1971; the major life threatening complications associated with illegal abortions have been minimized, although certain procedure related complications like trauma at the time of cervical dilatation need to be taken care of.

Cervical dilatation before suction evacuation is probably the most critical step of the procedure.¹ It is usually accomplished using tapered mechanical dilators, which may cause cervical injury or uterine perforation. Cervical priming prior to cervical dilatation reduces the risks of cervical injury by making the cervix softer and easier to dilate and to a lesser extent, uterine perforation. Over the years, a number of effective methods of cervical priming have become available: osmotic dilators, anti-progesterone and prostaglandins. Of these, prostaglandins remain the most widely used method of cervical priming.

Many of the natural and synthetic analogues of prostaglandins are available. One of the most widely used Prostaglandin synthetic analogue is Carboprost Tromethamine (15-methyl Prostaglandin F_{2α}.) This drug when given intramuscularly for cervical priming, though effective, is associated with too many side effects.^{2,3,4}

Recently, Misoprostol (15-deoxy-16hydroxy-16-methyl, a synthetic analogue of naturally occurring prostaglandin E₁), is used for cervical priming. It is usually used in the management of NSAID induced gastritis. This drug has established a lead for cervical priming in terms of availability, ease of administration, cost and effectiveness. In fact, it appears that both sublingual and vaginal Misoprostol given at dosages of 400µg are effective for cervical priming when administered 2 to 3 hours prior to surgical vacuum aspiration.⁵ Availability of newer safe drugs with possibility of minimizing the side effects motivated us to perform the aforesaid study.

MATERIALS AND METHODS: This prospective randomized study was carried out at one of the teaching hospitals in Mumbai following approval by the institutional Ethics committee over the period of 2years (September 2008 and September 2010). Total Eighty pregnant women requesting pregnancy termination under MTP act 1972 who reported to OPD were included in the study after written informed consent. Pregnancy duration was determined by menstrual history, bimanual examination and confirmed with trans-abdominal ultrasound examination in all cases. Women with acute pelvic inflammatory disease, active cardiac, pulmonary, renal or hepatic disease, bronchial asthma or known hypersensitivity to prostaglandins were excluded from the study.

A pre-procedure Hemoglobin estimation, ABO and Rh typing and routine urine examination was performed. Women requesting pregnancy termination up to the 12th week were admitted in the morning of the day of procedure. They were randomly selected by using opaque sealed envelope in Group I who received 400 µg of sublingual Misoprostol or Group II, which received an intramuscular injection of 250 µg of Carboprost, by a nurse, 2 hours prior to suction evacuation. Both these drugs are approved by DCGI (Drug Controller General of India) for use in cervical priming. Suction evacuation was performed in all the women by the same surgeon to reduce the individual variability.

The side effects associated with Misoprostol and Carboprost including nausea, vomiting, abdominal pain, cramps and diarrhea were recorded. The procedures were done under intravenous analgesia. The amount of baseline cervical dilatation before performing suction evacuation was measured using Hegar's dilators. The dilators were passed through the cervix in descending order starting with size 12. The largest Hegar's dilator passing through the internal os without resistance was regarded as the baseline dilatation achieved and if additional mechanical dilatation of cervix required was also noted. If the cervix had a dilatation appropriate or more for that period of

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gestation, no further dilatation was performed. Electric suction evacuation was done using appropriate size of Karman's cannula. This was followed by check curettage. All women in both groups had the procedure performed while under general anesthetic agent. The completeness of the procedure was ensured by the gritty feel of the uterus against the instrument and the appearance of bubbles in the cannula. Any cervical or uterine injuries ranging from superficial cervical laceration to an ascending cervical tear, uterine perforation or injury to any other intra-abdominal organs were noted.

A prophylactic dose of 250IU (50µg) Rh D immunoglobulin was offered to all Rh D negative women with Rh positive partners, who had no preformed anti-D to ensure adequate protection.

The primary outcome recorded was baseline cervical dilatation. Intraoperative complications and incidences of nausea, vomiting, abdominal pain /cramp and diarrhea were noted as secondary outcome. Patient acceptability was assessed by questionnaire completed at the time of discharge from the hospital.

Data were entered on a personal computer-held data base and were analyzed with the Statistical Package for Social Sciences (SPSSInc, Version15). Continuous variables were compared using the ttest/ANOVA. Categorical variables were compared using the Chi-Square test or Fisher exact test. Confidence intervals were used where appropriate, and statistical significance was defined as a probability value<0.05.

RESULTS:

- Eighty women were recruited for this study of cervical priming before suction evacuation and randomized into two equal groups, one in which sublingual Misoprostol 400µg was used (n=40) and the other in which intramuscular Carboprost 250µg was used (n=40). There were no differences in the baseline characteristics between the two groups. (Table1).

Characteristics	Misoprostol Group (n=40)	Carboprost Group (n=40)	P value
Age in years (Mean)	29.2	30.25	0.39
Parity (Mean)	1.43	1.35	0.63
Previous vaginal deliveries, n (%)	30 (81.1)	34 (89.5)	0.26
Previous abortions, n (%)	16 (40)	17 (42.50)	0.82
Gestational age in week (Median range)	8.878	8.674	0.39
Pulse Beats/min (Mean)	82.5	83.35	0.37
Systolic BP in mm of Hg (Mean)	115.2	114.4	0.70
Diastolic BP in mm of Hg (Mean)	76.15	76.4	0.86

Table 1: Baseline Characteristics of the Two Groups

Comment: There were no differences in baseline characteristics of both the groups.

- Mean baseline cervical dilatation prior to suction evacuation was 7.645+/-1.20 mm in the Misoprostol group and 7.724+/-0.64 mm in the Carboprost group (P>0.05). (Table2).

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Drug Used	Mean	N	Std. Deviation
Misoprostol	7.645	38	1.2076
Carboprost	7.724	38	0.6441
Total	7.684	76	0.9621

Table 2: Mean Baseline Cervical Dilatation in the Two Groups

Comment: There was no significant difference in Mean Baseline Cervical Dilatation in both the groups. ($P > 0.05$).

- In the sublingual Misoprostol group, 17 women (42.5%) had cervical dilatation > 8 mm, compared with 7 women (17.5%) in the Carboprost group at the time of evaluation ($P = 0.004$). Two patients in both the groups had an open os. (Table 3).

Up to dilator no.	Misoprostol Group	Carboprost Group
4	1	0
5	1	0
5.5	1	0
6	3	2
6.5	3	3
7	1	3
7.5	4	4
8	9	21
8.5	11	5
9	4	-
Os open	2	2
Total	40	40

Table 3: Baseline Cervical Dilatation in millimeters (Using Hegar's dilators in descending orders) the Two Groups

Comment: Baseline Cervical Dilatation > 8 mm was seen in 17 cases of Misoprostol V/S 7 of Carboprost ($P = 0.004$).

- The side effects including nausea (30%/17.5%), vomiting (27.5%/2.5%), and abdominal cramps (42.5%/20%) were more in Carboprost group as compared to Misoprostol group respectively. No patient had diarrhea in Misoprostol group as against 32.5% in Carboprost ($P < 0.0001$) (Table 4).

Side Effects (%)	Misoprostol Group (n=40)	Carboprost Group (n=40)	P value
Nausea	17.5	30	0.189
Vomiting	2.5	27.5	0.002
Abdominal cramps	20	42.5	0.0299
Diarrhea	0	32.5	< 0.0001

Table 4: Side Effects of the Two Groups

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Comment: Side effects like vomiting, abdominal cramps and diarrhea were significantly more in Carboprost group compared to Misoprostol($P < 0.05$).

- There were no complications like incomplete evacuation, cervical lacerations or uterine perforation noted in either group.

DISCUSSION: Although suction evacuation is a rapid and relatively safe method for the termination of pregnancy in the first trimester, the frequency of complications increases with increasing pregnancy duration.⁶ Some of these complications e.g. cervical injury and uterine perforation are directly related to the mechanical dilatation necessary for the procedure,⁷ where as other complications e.g. haemorrhage and incomplete evacuation of pregnancy material may be due to insufficient or difficult dilatation. However these complications can be avoided by a method that allows a natural and slow dilatation of the cervix.

The use of laminaria tent for gradual dilation of the cervix has been practiced for years but is not without any drawbacks.⁸ The insertion and removal is not always easy, and complications such as displacement of the tent inside the uterus and perforation of uterus may occur.⁹

Recently, Misoprostol has become a more popular priming cervical agent than the other prostaglandin analogues. Its advantages are few systemic side effects, availability, ease of administration, stability at room temperature and lower cost. Misoprostol can be administered orally, vaginally, rectally and sublingually. Several studies have compared the efficacy of the oral, sublingual and vaginal routes of administration of Misoprostol for cervical priming prior to surgical abortion.^{10,11}

Although vaginal administration has been found to be more effective than oral administration; most women try to avoid it because of the inconvenience and invasion of privacy.¹² Our study shows sublingual Misoprostol to be as effective as intramuscular Carboprost for cervical priming prior to surgical abortion up to 8 weeks. For longer gestations requiring greater cervical dilatation (≥ 8), sublingual Misoprostol was found to be more effective than intramuscular Carboprost (P value-0.004).

The sublingual route of administration uses the most vascular area of the buccal cavity and avoids the first pass effect through the liver. It avoids the uncomfortable vaginal administration or intramuscular injection and being water soluble, the Misoprostol tablets can be dissolved under the tongue within 15-20 minutes, resulting in faster onset of action and more reliable absorption of the drug. Sublingual Misoprostol has the advantage of being more convenient to administer and may be more suitable for day surgery.¹³

In one case in the sublingual Misoprostol group, where the priming interval got extended to 4 hours, complete expulsion of an intact gestational sac was found with minimal bleeding and no adverse effects. Although priming intervals of 3 to 4 hours have shown to be more effective than shorter priming intervals, use of 400 μ g misoprostol with a minimal evacuation time interval of three hours still appears the optimal dosage and evacuation time for cervical priming before first trimester termination of pregnancy,¹⁴ More recent study by Mathur M et al compared 75 patients each of direct suction evacuation with prior cervical priming with 400 μ g of sublingual Misoprostol three hours prior to procedure. They concluded sublingual Misoprostol causes adequate cervical dilatation and facilitates surgical abortion by reducing blood loss, operative time and complication rate significantly.¹⁵

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Achieving the optimal priming intervals can be a practical problem, even under strict study settings as most surgical abortions are performed on day case operating lists with women admitted just before surgery. The sublingual route may allow women to take Misoprostol at home before hospital admission and help achieve optimal priming intervals before surgical abortion.

In our study, the side effects including nausea (30%/17.5%), vomiting (27.5%/2.5%), abdominal cramps (42.5%/20%) and diarrhea (32.5%/0%) were more in Carboprost group as compared to Misoprostol group. A study by Mathur M et al found incidence of nausea and vomiting (24%), lower abdominal pain(15%) and no incidence of diarrhea in 75women in whom 400µg sublingual misoprostol was used 3 hours prior.¹⁵ In our study no patient had diarrhea in Misoprostol group as against 32.5% in Carboprost (P<0.0001). There were no complications like incomplete evacuation, cervical lacerations or uterine perforation noted in either of our group. Hence, due to less and tolerable side effects and more convenient route of administration Misoprostol was more acceptable by patients when compared to Carboprost.

OUR EXPERIENCE: At the end of the study, we have followed the protocol of 2tablets of sublingual Misoprostol (200µg each), 2 hours prior to first trimester suction evacuation in next 616 patients in last 4 years (October2010-September2014) with results consistent with our study. Additionally, it was safely used even in cases with history of bronchial asthma where Carboprost was contraindicated.

CONCLUSION: Sublingual Misoprostol is more effective for longer gestations requiring more dilatation, safer and more acceptable alternative due to less severe side effects to intramuscular Carboprost for cervical priming prior to first trimester suction evacuation.

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