International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Saroha I et al. Int J Reprod Contracept Obstet Gynecol. 2020 Feb;9(2):748-754
www.ijrcog.org

pISSN 2320-1770 | eISSN 2320-1789

DOI: http://dx.doi.org/10.18203/2320-1770.ijrcog20200371

Original Research Article

Comparative study of sublingual versus vaginal misoprostol for induction of labor

Indu Saroha[1], Sita Thakur[2], Ajay Sood[2], Kamal Singh[2]*, Monica Karpa[2], Swarnima Singh[2]

[1]Department of Obstetrics and Gynecology, PGIMER, Chandigarh, Punjab, India
[2]Department of Obstetrics and Gynecology, Dr. RPGMC, Kangra, Himachal Pradesh, India

Received: 12 December 2019
Accepted: 04 January 2020

***Correspondence:**
Dr. Kamal Singh,
E-mail: singh.kamal396@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Induction of labor done, when the benefits to either mother or fetus outweighs those of continuing pregnancy. Pharmacological methods used for induction includes oxytocin, prostaglandin (E_1, E_2) and mifepristone. However the ideal dose, route and frequency of administration of misoprostol are still under investigation. Hence we plan to do a comparative study between sublingual and vaginal misoprostol for inducing labor.
Methods: A prospective randomized interventional study was conducted on seventy pregnant women who met the inclusion criteria. They were explained about the study on admission and were randomized into two groups: Group I (sublingual) and Group II (vaginal). Bishop score at start of induction, number of pelvic examinations, doses required, mode of delivery, induction to delivery interval, duration of different stages of labor and perinatal outcome of the women were recorded followed by statistical analysis.
Results: Patients in both the groups were comparable with respect to demographic data, period of gestation, gravidity and parity. There was no significant difference with regard to number of doses, p/v examinations and number of patients required augmentation. Mean induction to delivery interval, average duration of first, second and third stage was almost comparable. Out of 35 women in each group, 29 women (82.8%) in both groups had normal vaginal delivery, one woman in Group I and three women in Group II had instrumental delivery. Emergency LSCS was done in 5 women (14.28%) in Group I and 3 women (8.57%) in Group II.
Conclusions: Sublingual misoprostol seems as effective as vaginal misoprostol for induction of labor at term. Sublingual route represents a valid alternative to vaginal route with the advantage of convenience of administration. In view of limited sample size, we cannot reach definitive conclusions in regard to the preference of sublingual or vaginal route of misoprostol for induction of labor.

Keywords: Bishop score, Oxytocin, Postdatism, Prostaglandins, Prelabor rupture of membranes, Sublingual, Vaginal

INTRODUCTION

Induction of labor implies stimulation of uterine contractions before spontaneous onset of labor, with or without ruptured membranes.[1] Induction is indicated when the benefits to either mother or fetus outweighs those of continuing pregnancy.[2] In 2006, 22.5% of births were pharmacologically induced in USA, a 50% increase since 1990. In developing countries the rates of induction are generally lower, but in some settings they can be as high as those observed in developed countries.[3] Evidence suggests that this recent escalation stems from increased identification of prenatal risks and post term pregnancy. This concomitant inflation necessitates the development of safe, cost effective and more efficient means of induction. The continuation of a woman's pregnancy requires that her cervix remains closed and rigid and that her uterus quiet and not contracting. Both these

conditions need to be reversed to initiate labor. The ways in which this is achieved are unknown but there is evidence that suggests the fetus itself plays an integral part. From the 2nd century through the end of 17th century numerous non-pharmacological methods have been used for the labor induction including stripping of membranes, amniotomy, trans-cervical catheter, extra-amniotic saline infusion and hygroscopic dilatation of cervix. Recently pharmacological methods have gained importance which includes oxytocin, prostaglandin (E_1, E_2) and mifepristone.

Prostaglandins were used clinically to induce labor in late 1960's with subsequent administration of various formulations of prostaglandins like PGE1 tablets and PGE2 gel. Misoprostol is a synthetic prostaglandin E1 methyl ester that stimulates myometrial contractions in pregnant uterus by binding to EP_2 and EP_3 prostanoid receptors. The use of misoprostol for induction of labor with live fetus was 1st described in 1992 in the pioneering study by Margulies et al.[4] In 2000, Searle GD and company notified physicians that misoprostol is not approved for labor induction. Despite this American college of obstetricians and gynecologists (2000) quickly reaffirmed its recommendation for use because of proven safety and efficacy.[5] It can be used orally, vaginally and sublingually. However the ideal dose, route and frequency of administration are still under investigation. Vaginal misoprostol appears to be more effective than the equivalent dosage administered orally but is associated with a higher risk of uterine hyper stimulation both without and with fetal heart rate (FHR) changes. The sublingual route could thus be expected to be more effective than vaginal misoprostol, and by avoiding a direct effect on the cervix, it might reduce the risk of uterine hyper stimulation. Utilization of sublingual misoprostol for labor induction has not been reported in literature prior to 2001.[6] Sublingual misoprostol has an additional advantage of easier administration, greater freedom of position after insertion and avoidance of repeated vaginal examinations.

Despite of large body of literature on the subject, there are very few randomized control trials comparing sublingual misoprostol with vaginal misoprostol for induction of labor. So there is a need for further investigation regarding the efficacy and safety of the two routes of misoprostol administration for induction of labor. Hence we plan to do a comparative study between sublingual and vaginal misoprostol for inducing labor.

METHODS

A prospective randomized interventional study was conducted in the department of obstetrics and gynecology, Dr. Rajendra Prasad Government Medical College, Kangra at Tanda (Himachal Pradesh) after taking approval of Protocol Review and Institutional Ethics committee from June 2014 to May 2015. A total of seventy women, who met the inclusion criteria were recruited into the study. Women > 18 years of age, singleton pregnancy, vertex presentation, gestational age 37-42 weeks with Bishop's score < 6, AFI >5 and Reactive NST were included for study. Exclusion criteria includes any contra-indications to vaginal delivery, previous scarred uterus, severe IUGR, severe oligohydramnios, severe PET, eclampsia, grand multipara, intrauterine fetal death, fetal congenital malformation, and known hypersensitivity to prostaglandins.

Women who met the inclusion criteria were randomized into two groups: Group I (sublingual) and Group II (vaginal) by a computer generated randomization table. The randomization sequence was kept in a sealed opaque envelope to be opened by the investigator after enrollment of woman into the study. Clinical details including demographic data, presenting complaints, previous obstetrics and menstrual history of subjects were noted. A thorough clinical examination including general physical examination, systemic examination, per abdomen, per speculum and pelvic examination was done. Subjects were investigated, Non-stress test and amniotic fluid index (AFI) were done. At time of induction, Bishop's score was assigned.

The women in group I were given tablet misoprostol 25 mcg sublingually, while in group II induction was done by vaginal insertion of tablet misoprostol 25 mcg. Repeated doses were given every 4 hours for a maximum of 5 doses. Women receiving vaginal misoprostol were asked to lie down in supine position for half an hour after drug administration. Repeat dosing was withheld at labor onset or entry into active phase (cervical dilatation of 3 cm or more). Once Misoprostol was stopped, membranes were ruptured artificially and labor augmentation with intravenous oxytocin was done if necessary after 4-6 hours of last dose of misoprostol. Active stage of labor was monitored parto-graphically. Following outcomes were recorded:

Primary outcome

- Number of women delivered vaginally.

Secondary outcomes

- Time interval from initiation of induction to entry into active phase of labor
- Time taken from onset of labor to delivery
- Doses of misoprostol required
- Number of women with bishop score 6 or > 6 after 5 doses
- Mode of delivery
- Number of subjects requiring oxytocin
- Number of subjects developing hyper stimulation
- Number of women with failed induction
- Number of subjects requiring cesarean section
- Perinatal outcomes.

Statistical analysis

The statistical difference between two groups were compared using appropriate statistical tests. The p value of < 0.05 was considered as statistically significant.

RESULTS

The average age of the patients in two Group I was 25.10±3.58 years and in Group II was 25.21±3.56 (p > 0.05). Similarly the mean BMI in sublingual group was 23.02±2.64 and in vaginal group was 23±3.40 which is comparable in both groups. Among both groups there was no difference in respect to gravidity and parity with mean gravidity 1.51±0.91 and 1.49±0.78 (p = 0.89) respectively. The mean POG at induction in group I, 39.42±1.11 and in group II was 39.80±1.05 (p > 0.05) (Table 1).

At the time of start of induction Bishop score was less than six with the (p > 0.77). The average number of doses of misoprostol required in sublingual group was 2.2±1.29 and in vaginal group was 2.4±1.11 (p > 0.89). Mean Bishop Score at the end of induction was similar (mean 8.13) in both groups (p = 0.79). In sublingual group 23 (65.71%) compared to 20 (57.14%) in vaginal group required labor augmentation with oxytocin (p = 0.45). No significant difference amongst various indications for induction of labor between the two groups (p > 0.05). Postdatism was the most common indication in both the groups (42.8% women in sublingual group and 45.7% women in vaginal group) followed by Pre-labor rupture of membranes (PROM). More number of women were induced for PROM in sublingual group (31.2%) as compared to 17.1% women in vaginal group (p > 0.05). Rest of the indications were like Intra-hepatic cholestasis of pregnancy, mild IUGR and gestational hypertension and oligohydramnios which accounted for nearly 31.4% inductions (Table 2).

In both the groups, interval between induction and onset of active labor was comparable with mean interval in sublingual group was 8.57±5.21 hours as compared to 9.74±5.40 hours in vaginal group (p = 0.36. Majority of women (85.7% and 77.43%) had onset of labor within 12 hours of induction (p > 0.05) (Table 3).

Table 1: Mean of baseline characteristics, Bishop score at induction, doses of misoprostol and augmentation requited.

Demographic data	Group I	Group II	p-value	Significance
Age	25.10±3.58	25.21±3.56	p = 0.30	NS
Residence R/U	85.71/14.28	94.28/5.71	p = 0.74	NS
BMI	23±2.64	23±3.04		NS
Clinical data				
Gravidity	1.51±0.91	1.49±0.78	0.89	NS
Parity	1.25±0.50	1.25±.61	0.65	NS
POG	39.42±1.11	39.80±1.05		NS
Bishop score at induction	4.49±0.76	4.44±0.79	0.77	
At completion	8.13±1.35	8.13±1.33	0.79	
Doses of misoprostol required	2.21±1.29	2.4±1.11	0.89	NS
Augmentation required	65.71	57.14	0.45	NS

Table 2: Indication for induction.

Indication	Group 1		Group 2		p-value	Significance
Post date	15	42.85	16	45.71	0.81	NS
PROM	11	31.42	6	17.14	0.16	NS
ICP	2	5.71	5	14.28	0.23	NS
IUGR	4	11.42	2	5.71	0.39	NS
Gestational HTN	2	5.71	5	14.28	0.23	NS
Oligohydramnios	1	2.85	1	2.85	1	NS

With respect to delivery, 54.28% women in Group I and 48.57% women in Group II delivered within 12 hours after starting induction. Mean induction to delivery interval was 13.20±7.56 hours in Group I and 14.35±6.68 hours in group II (p = 0.67). Average duration of ROM in sublingual was 8.31±7.26 hours as compared to 6.78±3.34 hours in vaginal group (p-value of < 0.05). More than 3/4th of the women in both groups (77.1% and 94.2%) delivered within 12 hours of ruptured

membranes. Before giving next dose per vaginum examination was done with average number of p/v examinations in sublingual group were 3.45±1.70 and 3.05±1.37 in vaginal group (p > 0.28). The average duration of first stage of labor was 4.73±2.59 hours and 4.82±2.47 hours (p = 0.89) respectively. The average duration of second stage in sublingual and vaginal group was 26.82±16.03 and 27±18.50 minutes (p = 0.58) and of third stage was 6.02±2.29 minutes and 5.77±2.75 minutes, respectively (p = 0.67).

Table 3: Labour characteristics.

	GR I	GR II	p-value	Significance
Induction - active phase interval	8.87±5.21	9.74±5.40	0.36	NS
Induction- delivery interval	13.20±7.56	14.35±6.68	0.67	NS
DROM	8.31±7.26	6.78±3.37	<0.05	Significant
No of P/V examination done	3.45±1.70	3.05±1.37	0.28	NS
Duration:				
1st stage (active phase) in hours	4.75±2.59	4.82±2.47	0.89	NS
2nd stage in minutes	26.82±16.03	27±18.50	0.58	NS
3rd stage in minutes	6.02±2.29	5.77±2.7	0.67	NS
Mode of delivery				
Vaginal normal	82.85	82.85	1	NS
Vaginal operative	2.85	8.57	0.30	NS
Caesarean section	14.28	8.57	0.45	NS

Table 4: According to perinatal outcomes.

Outcome measure	Group 1 (sublingual)		Group 2 (vaginal)		p-value	Significance
	N = 35	%	N = 35	%		
Live birth	35	100	35	100		NS
Avg birth wt	2.9±0.5		3.0±0.4		> 0.05	NS
Ante/intra partum fetal distress	6	17.14	7	20	0.75	NS
NICU admission for < 24 hours	2	5.71	5	14.28	0.39	NS
NICU admission > 24 hours	4	11.42	2	5.71	0.39	NS
Mean Apgar score						
At 1 min	7.54±0.78		7.68±1.07		0.53	NS
At 5 min	9.45±0.88		9.62±0.87		0.42	NS
Apgar score < 7 at 5 minutes	6	17.14	7	20	0.55	NS
Mean hospital stay	3.68±1.79		3.65±1.37		0.74	NS

Out of 35 women in each group, 29 women (82.8%) in both groups had normal vaginal delivery. One woman in Group I and three women in Group II had instrumental delivery. Emergency cesarean section was done in 5 women (14.28%) in sublingual group and 3 women (8.57%) in vaginal group (p = 0.45) Table 3. In Group I, 5.71% and 14.28% women in Group II experienced nausea and vomiting. Hyper stimulation was noted in 8.57% women in vaginal group and 5.71% women in sublingual group suggesting more number of women in vaginal group experienced maternal side effects (p > 0.05).

Meconium passage was seen in four neonates (11.42%) in sublingual Group I as compared to two (5.71%) in Group II. Non-reassuring fetal heart rate was noted in two (5.71%) in Group I and five (14.28%) Group II (p = 0.23). The average birth weight of neonates (p > 0.05) and NIC admission (p = 0.39) were comparable in both groups. The mean Apgar score at 1 minute was 7.54±0.78 in sublingual group and 7.68±1.07 in vaginal group. The mean hospital stay in women in sublingual and vaginal group was 3.68±1.79 days and 3.65±1.37 days respectively (p > 0.05). The mean pre-delivery and post-delivery hemoglobin in Group I and in Group II was 10.89±1.94 gm%, 10.70±1.41 gm% and 10.72±1.28 gm%, 10.36±1.26 g% respectively (p > 0.05).

DISCUSSION

The onset of spontaneous labor is a robust and effective mechanism which is proceeded by the maturation of several fetal systems, and should be given every opportunity to operate on its own. We should only induce labor when we are sure that we can do better. Misoprostol is a synthetic Prostaglandin E1 analogue used in cervical ripening and labor induction at term in developed as well as developing countries. It is a low cost product, easily

available, affordable and stable at room temperature. It can be used orally, vaginally and sublingually for labor induction. Oral and sublingual misoprostol have a rapid onset of action. Sublingual and vaginal misoprostol may perhaps be compared as both have mucosal uptake, have prolonged activity and possess a greater bioavailability.

The various antenatal characteristics were taken into account like maternal age, weight, BMI, booking status, gravidity and parity of women in both the groups were comparable. In present study the mean age of the women in Group 1 was 25.10±3.58 and in Group II was 25.21±3.56 (p = 0.30) comparable to studies by Calisken et al, Bartusevicius et al, Zahran et al, and Tayyba et al.[7-10] Similarly, the mean BMI of women in sublingual group was 23.02±2.64 and in vaginal group it was 23±3.4 (p = 0.74) comparable to study by Bartusevicius et al was 25±5.8 in sublingual group and 24±5.9 in vaginal group.[8] (Table 5). The mean parity in the study was 1.25±0.5 in sublingual group and 1.25±0.6 in vaginal group. which is coparable to; Bartusevicius et al, Nassar et al and Ayati et al.[9-12]

Table 5: Comparison of mean age, BMI and parity.

Study	Average gestational age		Bishops score	
	Sublingual	**Vaginal**	**Sublingual**	**Vaginal**
Bartusevicius et al[8]	41±0.9	40±1.1	4.1±1.0	4.1±1.0
Nassar et al[11]	39.5±1.6	39.2±1.4	2.6±1.6	3.0±1.7
Ayati et al[12]	39.7±1.8	39.8±1.4	3.4±1.6	2.7±1.3
Zahran et al[9]	40.5±2.0	40.7±1.8	2.2±1.2	2.4±1.2
Fakhir et al[13]	39.5±1.0	39.5±1.1	1.9±1.0	1.7±1.1
Present study	39.4±1.1	39.8±1.0	4.4±0.7	4.4±0.7

Table 6: Comparison of gestational age and Bishop score at start of induction.

Study	Average gestational age		Bishops score	
	sublingual	**Vaginal**	**Sublingual**	**Vaginal**
Bartusevicius et al[8]	41±0.9	40±1.1	4.1±1.0	4.1±1.0
Nassar et al[11]	39.5±1.6	39.2±1.4	2.6±1.6	3.0±1.7
Ayati et al[12]	39.7±1.8	39.8±1.4	3.4±1.6	2.7±1.3
Zahran et al[9]	40.5±2.0	40.7±1.8	2.2±1.2	2.4±1.2
Fakhir et al[13]	39.5±1.0	39.5±1.1	1.9±1.0	1.7±1.1
Present study	39.4±1.1	39.8±1.0	4.4±0.7	4.4±0.7

Table 7: Comparison of various modes of delivery in study group.

Study (in percentage)	Spontaneous vaginal delivery		P-value	Instrumental delivery		p-value	Cesarean section		p-value
	S/l	**Vag**		**S/l**	**Vag**		**S/l**	**Vag**	
Calisken et al[7]	78.8	81.3	NS	2.5	1.3	NS	18.8	17.5	NS
Bartusevicius et al[8]	76	77	NS	7.1	2.9	NS	17	20	NS
Nassar et al[11]	58.8	57.7	NS	5.9	14.1	NS	35.3	28.2	NS
Ayati et al[12]	84.8	90	NS	1.1	0	NS	14.1	10	NS
Zahran et al[9]	70.4	66.7	NS	-	-	-	29.6	33.3	NS
Fakhir et al[13]	66.7	68.4	NS	15.8	12.3	NS	17.5	19.3	NS
Tayyba et al[10]	76	77	NS	7.1	2.9	NS	17	20	NS
Prabha et al[14]	62	58	NS	10	6	NS	28	36	NS
Present study	82.8	82.8	NS	2.8	8.5	NS	14.2	8.5	NS

The average gestational age at the time of induction of labor in our study was 39.4±1.1 weeks in sublingual group and 39.8±1.0 weeks in vaginal group (p = 0.16), similar studies by Nassar et al, Ayati et al and Fakhir et al (Table 6).[11-13] However, in the study conducted by Bartusevicius et al and Zahran et al, the average gestational age was (41±0.9 weeks and 40±1.1weeks) and (40.5±2 weeks and 40.7±1.8 weeks) respectively, slightly higher than our study.[8,9]

The average bishop score at start of induction was 4.49±0.76 in sublingual group and 4.44±0.79 in vaginal group comparable to Bartusevicius et al, 4.1±1.0 but higher than the study by Calisken et al, Ayati et al, and

Fakhir et al.[7,8,12,13] Average doses of misoprostol required were 2.2±1.2 and 4±1.1 similarly to study by Ayati et al.[12] The requirement of oxytocin for augmentation was 23 women (65.7%) in Group I and 20 (57.14%) in Group II, Bartusevicius et al, Fakhir et al, and Tayyba et al, the requirement of oxytocin was nearly 50-60% in both sublingual and vaginal group.[8,13,10]

Table 8: Comparison of induction-delivery interval in study groups.

Study	Induction-delivery interval in sublingual group (in hours)	Induction-delivery interval in vaginal group (in hours)	p-value	Significance
Calisken et al[7]	11.8±7.0	12.4±6.3	> 0.05	NS
Bartusevicius et al[8]	15.0±3.7	16.7±4.1	0.03	Significant
Nassar et al[11]	11.6±5.3	11.5±5.1	0.9	NS
Ayati et al[12]	11.6±6.7	11.0±3.4	0.61	NS
Zahran et al[9]	17.2±3.9	17.8±3.5	> 0.05	NS
Fakhir et al[13]	10.4	11.7	0.46	NS
Present study	13.2±7.5	14.3±6.6	0.67	NS

Table 9: Comparison of maternal and fetal side-effects.

Study (in percentage)	G/I side effects and hyperpyrexia		Hyper stimulation syndrome		Meconium passage		NRFHR	
	S/l	Vag	S/l	Vag	S/l	Vag	S/l	Vag
Calisken et al[7]	-	-	5	1.3	11.3	6.3	-	-
Feitosa et al[15]	12	13	-	-	16	13	13	9
Nassar et al[11]	12.8	13.8	8.2	9.4	-	-	12.9	17.6
Ayati et al[12]	12	10	0	0	5.5	6	-	-
Zahran et al[9]	16.3	15.4	6.7	10.4	13.8	16.3	7.9	6
Hissane et al[16]	12	13	8	7	12	17	12	17
Fakhir et al[13]	9.5	14	3.5	11.1	-	-	-	-
Prabha et al[14]	-	-	5	1.3	14	24	-	-
Present study	5.71	14.28	5.71	8.57	11.42	5.71	5.71	14.28

In sublingual group, 85.6% women and 91.3% women in vaginal group had vaginal delivery (p > 0.05) with slightly higher incidence of instrumental delivery in vaginal group (8.57%) as compared to sublingual group (2.81%) (Table 7). Calisken et al, Bartusevicius et al, Ayati et al and Tayyba et al, similar number of women had vaginal delivery with misoprostol.[7,8,10,12]

The average induction to delivery interval in our study was 13.20±7.56 hours in Group I and 14.35±6.68 hours in Group II comparable to study by Calisken et al, Nassar et al and Ayati et al, (p > 0.05).[7,8,12] The average no of P/V examinations done in the sublingual and vaginal group were 2.46±1.29 and 2.50±1.27 in vaginal group) respectively, similar to study by Nassar et al (Table 8, 9).[11] The maternal side effects like nausea, vomiting and hyper stimulation syndrome occurred more in vaginal group as compared to the sublingual group (22.6% versus 11.4%) with similarly result by Nassar et al and Fakhir et al.[11,13] Though in majority of the studies including our study, more maternal side effects were noted with vaginal misoprostol as compared to sublingual misoprostol but the difference was not statistically significant (p > 0.05). Higher incidence of meconium passage was noted with sublingual misoprostol as compared to the vaginal group (p > 0.05) and similar by Calisken et al and Feitosa et al.[7,15] Whereas, more number of women in vaginal group as compared to the sublingual group had abnormal fetal heart changes (p > 0.05), Non-reassuring fetal heart rate was observed in 5.7% women in sublingual group and 14.2% women in vaginal group.[11,16] More number of newborns in Group I had low Apgar score of less than 7 at 5 minutes (5.7%) as compared to babies born to women in Group II (2.8%) while, Zahran et al and Fakhir et al had slightly higher number of babies in vaginal group with low 5 minute Apgar score.[9,13] Seven neonates (20%) in vaginal group as compared to six neonates (17.1%) born to sublingual group were admitted to NICU (p > 0.05), similar by Fakhir et al and Prabha et al.[13,14]

Because plasma levels of misoprostol and the area under the curve are significantly greater when the same dose is administered sublingually rather than vaginally, the sublingual route could be expected to be more effective. The expectations however were not confirmed by the observations made in our study. No difference was found between sublingual and vaginal groups in relation to the number of doses required, induction to delivery interval and mode of delivery. There was no significant difference

in the maternal and fetal side-effects and perinatal outcomes though meconium passage was noted more in sublingual group and maternal side effects were more in vaginal group. It was noted that the sublingual misoprostol is as safe as vaginal misoprostol in term pregnancies but more studies with larger sample size are recommended to confirm or negate this possibility.

CONCLUSION

Different routes of misoprostol administration for labor induction necessitate carefully balancing the benefits (shorter induction to delivery interval) against the risk (uterine hyper stimulation, adverse maternal and neonatal outcomes). No significant difference was found between sublingual and vaginal administration of misoprostol in relation to the number of doses required, induction to delivery interval and mode of delivery. There was no significant difference in the maternal, fetal side-effects and perinatal outcomes although slightly more number of women in vaginal group experienced maternal side effects including hyper stimulation while sublingual route was associated with more meconium passage. It was concluded that sublingual misoprostol seems as effective as vaginal misoprostol for induction of labor at term. Sublingual route represents a valid alternative to vaginal route with the advantage of convenience of administration with greater freedom of position. However, it appears to offer no additional clinical advantage over the vaginal route. In view of limited sample size of our study, study cannot reach definitive conclusions in regard to the preference of sublingual or vaginal route of misoprostol administration for induction of labor.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Cunningham FG, Leveno KJ, Bloom SL, Hauth JC, Rouse DJ, Spong CY. Pregnancy Hypertension. In: Cunningham FG, Leveno KJ, Bloom SL, Hauth JC, Rouse DJ, Spong CY Eds., Williams Obstetrics, 23rd Edition, McGraw-Hill, New York; 2010:706-756.
2. Ramos SL. Induction of labour. Obstet Gynecol Clin North Am. 2005;32:181-200.
3. WHO. Recommendations for induction of labor. Geneva: World Health Organization; 2011.
4. Margulies M, Campos PG, Voto LS. Misoprostol to induce labour. Lancet. 1992;339:64.
5. American college of obstetricians and gynecologists. Response to Searle's drug warning on misoprostol. ACOG Committee Opinion. 2000;248:1-20.
6. Jana N, Arora N, Biswas SC. Misoprostol in cervical ripening and Induction of labour. In: Barik S, Dutta S, Gupta K. Misoprostol in obstetrics and gynecology. 7th Ed. New Delhi: Jaypee Brothers; 2005:70-80.
7. Caliskan E, Bodur H, Ozeren S, Corakci A, Ozkan S, Yucesoy I. Misoprostol 50 mcg sublingually versus vaginally for labor induction at term. Gynecol Obstet Invest. 2005;59:155-61.
8. Bartusevicius A, Barcaite E, Krikstolaitis R, Gintautas V, Nadisauskiene R. Sublingual compared with vaginal misoprostol for labour induction at term: a randomized control trial. Br J Obstet Gynaecol. 2006;113:1431-7.
9. Zahran KM, Shahin AY, Abdellah MS, Elsayh KI. Sublingual versus vaginal misoprostol for induction of labour at term: a randomized prospective placebo-controlled study. J Obstet Gynaecol Res. 2009;35:1054-60.
10. Tayyba A, Mehreen N. Comparison between Sublingual and Vaginal n misoprostol for Labor induction at term. Available at: http://pjmhsonline.com/octdec2013/comparison_between_sublingual.htm . Accessed 11 August 2019.
11. Nassar A, Awwad J, Khalil A, Abu MA, Mehio G, Usta I. A randomized comparision of patient satisfaction with vaginal and sublingual misoprostol for induction of labour at term. Br J Obstet Gynaecol. 2007;114:1215-21.
12. Ayati S, Vahidroodsari F, Farshidi F, Shahabian M, Afzal, Aghaee M. Vaginal versus Sublingual misoprostol for labour induction at term and post term: a randomized prospective study. Iran J Pharma Res. 2008;10:149.
13. Fakhir B, Aboulfalah A, Asmouki H, Soummani A. Sublingual versus vaginal misoprostol for labor induction at term: a prospective randomized trial. Sci Postprint. 2009;1(1):e00003.
14. Prabha S, Kulkarni VG, Kulkarni JV, Sreekantha, Yogesh B. The Study of Comparison of sublingual versus vaginal 25 microgram of misoprostol in the induction of labour at term. Int J Pharm Bio Sci. 2014;5(1):1-13.
15. Wolf FEL, Sampaio ZS, Alencar CA Jr, Amorim MMR, Passini R Jr. Sublingual versus vaginal misoprostol for induction of labour. Int J Gynaecol Obstet. 2006;94:91-5.
16. Hissane M, Karroumi M, Mikou F, Ghazli M, Matar N. Misoprostol sublingually versus vaginally for labor induction at term: a randomized study. Res Obst Gynecol. 2012;1(3):27-9.

Cite this article as: Saroha I, Thakur S, Sood A, Singh K, Karpa M, Singh S. Comparative study of sublingual versus vaginal misoprostol for induction of labor. Int J Reprod Contracept Obstet Gynecol 2020;9:748-54.