ORAL VERSUS VAGINAL MISOPROSTOL FOR INDUCTION OF LABOUR AT TERM

KHADIJA BANO, MAHJABEEN, SHEREEN ZULFIQAR BHUTTA

ABSTRACT

Objective — *To compare the safety and efficacy of misoprostol through oral and vaginal routes for induction of labor at term.*

Study design — *Cross-sectional comparative study.*

Place & Duration of study — *Department of Gynecology and Obstetrics, Ward-9, Jinnah Postgraduate Medical Centre Karachi, from October 2004 to March 2005.*

Patients and Methods — *Two hundred term patients meeting inclusion criteria for induction of labour were selected using non-probability convenient sampling technique. They were allocated to two groups to receive misoprostol 50 micrograms (µg) either by vaginal or oral routes. The dose was repeated at an interval of 4 hours till Bishop score improved or need arose for intervention. Results were analyzed through software SPSS version 10.0.*

Results — *Mean induction-delivery (I-D) interval were similar in both groups; vaginal (9.09 ±3.4 hours) and oral (9.81±4.43 hours p=0.33). Oxytocin augmentation and analgesia requirement were also not statistically significant (p=0.5). Only one patient had uterine hyper stimulation in the vaginal group. There was no significant difference between the groups with regard to caesarean section rate, maternal complications like post partum haemorrhage (PPH) and neonatal outcome.*

Conclusions — *Oral misoprostol has the potential to induce labour as safely and effectively as its vaginal analogue.*

Key words — *Misoprostol, Efficacy, Labor.*

INTRODUCTION:

The search for an ideal agent, timing and dosage interval to convert an unfavorable cervix to one receptive to delivery is an ongoing process. Prostaglandin oestradiol PGE_2 is an agent that has been shown to have utility in promoting cervical ripening and labour initiation. Recently, investigators have shown the use of alternative prostaglandin PGE_1 - misoprostol for cervix ripening and induction of labour (IOL).[1,2] It is a prostaglandin E_1 analogue, which was introduced as the treatment of gastric ulcer, but later on FDA approved a new label for the use of misoprostol during pregnancy.[3] It has been used for many years for the first and second trimester pregnancy terminations and induction of labour, because it acts as uterotonic and softens the cervix by increasing proteoglycan content. Misoprostol is an effective, economic and safe method for IOL in patients with eclampsia even with unfavorable Bishop score.[4,5]

Although vaginal application of misoprostol has been validated as a reasonable means of induction, there is patient resistance to digital examination necessary for placement of the agent. We designed this study to compare the safety and effectiveness of oral with vaginal misoprostol for induction of labor.

Correspondence:
Dr. Khadija Bano
Department of Gynecology and Obstetrics
Jinnah Postgraduate Medical Centre
Karachi-75510
jpmc622003@yahoo.com

PATIENTS AND METHODS:

This study included the patients admitted through emergency or outpatient department with indications for induction of labour at term (37-42 weeks). After taking history clinical examination was done and using non-probability convenient sampling 200 patients were selected for using 50µg of misoprostol (100 in each group). A preliminary admission CTG was done to assess fetal condition.

Inclusion criteria were women with singleton pregnancy, vertex presentation and gestational age greater than 37 and up to 42 weeks, Bishop score less than 5 and a reactive foetal cardiac activity .Women with intrauterine death, foetal abnormality with hydrocephalic baby and anencephaly were also included in the study. Multiple gestations scarred uterus, malpresentation, fetal distress and with other contraindications to prostaglandins use were also excluded.

Women who met the inclusion criteria were selected and a well informed written consent was obtained for every participant. Demographic data of the patients including age, parity, reason for induction, induction – delivery time interval, maternal and fetal side effects and mode of delivery were recorded. Initially 1/4th (50µg) of misoprostol were given orally or vaginally in women requiring IOL and poor Bishop score. Further doses were repeated 4hourly and up to maximum of 150 µg misoprostol was given or need arose for intervention. Patients were monitored for uterine contractions, hyper stimulation, nausea, vomiting, diarrhea, fever, vaginal bleeding and other untoward side effects. Partogragh was maintained. CTG was done before induction and after each insertion of misoprostol and then intermittently during labour. Requirement for augmentation of labour with oxytocin in either group was also recorded.

The data was entered and analyzed through software program SPSS version 10.0. The mean ID interval was compared by t-test. Complications due to different routes of administration were analyzed by their percentages and compared by Chi-square test of proportions.

RESULTS:

There was no significant difference in terms of maternal age, parity, gestational age and initial Bishop scores (table I & II). Mean Bishop score in the vaginal group was 2.42 and 2.54 in the oral group. Maximum three doses were given; mean dosage was 1.44 in the vaginal and 1.53 in the oral group (table I). Delivery time was similar for the vaginal and oral arms (9.09 hours versus 9.08 hours, p=0.33).

In terms of efficacy, 95 patients in the vaginal and 93 in the oral group needed augmentation of labour with oxytocin p= 0.5 (non significant). Analgesia was required in only three patients who were primigravida in oral group (table III). Caesarean delivery rate was similar for the vaginal and oral arms p=0.67. Main indications for intervention were foetal distress and non-progress of labour. Uterine hyper stimulation was observed in only one case of vaginal group which also had abnormal CTG. There was no statistical difference in neonatal outcome. Postpartum hemorrhage was not observed in any case.

DISCUSSION:

Misoprostol is being increasingly used for induction of labour since last few years because of its low-cost and effectiveness due to its stability at room temperature. There have been different published reports of misoprostol use, through different routes (oral, vaginal and rectal) and in varying doses (25 µg to 200 µg). Higher incidence of tachysystole is reported with higher doses.[2]

Table-I: Age, Gestational Age, Dose of Misoprostol in Two Routes For Induction of Labour

	Route	No.	Mean	Standard deviation	t-value	p-value
Age (years)	Vaginal	100	27.4	4.31	0.82	0.41 n.s
	Oral	100	26.53	4.44		
Gestational age (weeks)	Vaginal	100	38.96	2.04	0.81	0.41 n.s
	Oral	100	39.18	1.77		
No. of dosage (µ)	Vaginal	100	1.44	0.66	0.95	0.34 n.s
	Oral	100	1.53	0.69		

Table-II: Bishop Score And Induction To Delivery Interval

	Route	No.	Mean	Standard deviation	t-value	p-value
Bishop score	Vaginal	100	2.42	.69	-1.175	.241
	Oral	100	2.54	.74		
Induction to delivery time (hours)	Vaginal	56	9.09	3.407	-.978	.330
	Oral	59	9.81	4.435		

	Route		Chi-square	p-value
	Vaginal	Oral		
Oxytocin augmentation	95	93	0.4	0.5 (n.s.)

Table-III: Safety Parameters In Two Routes of Misoprostol

Parameters	Vaginal route	Oral route	Chi-square	p-value
Uterine hyperstimulation	1	0	1.0	0.31 (n.s)
Foetal distress	33	28	1.0	0.55 (n.s)
CTG changes	18	16	1.0	0.73 (n.s)
Meconium stained liquor	17	25	1.0	0.15 (n.s)

Table: IV
Mode of Delivery in Two Routes of Misoprostol

Mode of Delivery	Route	
	Vaginal	Oral
Spontaneous vaginal delivery	51	57
Caesarean section	42	41
Instrumental delivery	7	2

In this study same dosage regimens of 50µg at 4 hourly interval was used for both oral and vaginal arms for labour induction. The oral route was as effective as vaginal in terms of I-D interval, number of doses required. This is comparable to study results by Windrim who reported 50g oral Misoprostol being as effective as vaginal use.[6] Several others researchers have found that initial 50µg oral misoprostol is less effective and associated with longer I-D interval presumably because of " first-pass effects".[7,8]

Mean number of dose was also same in both arms of this study, although previous work have shown that vaginal misoprostol was efficacious than oral route in equivalent doses.[9,10] This is because of greater bioavailability of vaginal misoprostol, although this also has led to greater uterine hyper stimulation leading to non-reassuring foetal heart rate.[10] Need for oxytocin augmentation was slightly more in the vaginal arm but the difference in two was not statistically significant. This also reflects that uterine contractility was not exaggerated at this dosage regimen and misoprostol can be used safely orally. In contrast, another study conducted by Shetty et al reported more oxytocin augmentation with oral use.[11] In this study uterine hyper stimulation was observed in one patient in the vaginal group and none in the oral.[12] In contrast, Carl reported that out of 503 women with oral (200µg) and 501 with vaginal (50µg) route, efficacy of misoprostol was the same but frequency of uterine contractility and intervention was more with oral route.[13]

CONCLUSIONS:

Oral misoprostol appears to be a valid addition to the induction therapeutic armamentarium. However, as misoprostol tablets are commercially available in 200µg formulation and we used it after cutting the tablets into four pieces; this may have resulted in variable amount of active drug being delivered. It is needed that low dose tablets should be commercially available and further large trials should be done with this regimen to define its optimal effect.

REFERENCES:

1. Hossain N, Soomro N. Use of misoprostol for cervical ripening and induction of labor. Med Channel 2000;6:36-8

2. Agarwal N, Gupta A, Kiplani A. Six hourly vaginal misoprostol versus intracervical dinoprostone for cervical ripening and labor induction . J Obstet Gynaecol Res 2003;29:147-51

3. Jwarah E, Greenhalf JO. Rupture of uterus after 800 microgram misoprostol given vaginally for termination of pregnancy. Br J Obstet Gynaecol 2000;107:807

4. Sahin HG, Sahin HA, Kocer M. Induction of labour in toxemia with misoprostol. Acta Obstet Gynecol Scand 2002;82:252-57.

5. Nahar S, Begum S, Yasnur S. Use of misoprostol in induction of labor in unfavorable cervix in eclampsia. Pak J Med Sci 2004; 20:181-5.

6. Windrim R, Bennett K, Mundle W, Young D. Oral administration of misoprostol for labour induction :a randomized controlled trial. Obstet Gynecol 1977; 89:92-7.

7. Hall R, Duarte-Gardea M, Harles F. Oral versus vaginal misoprostol for labour induction .Obstet Gynecol 2002;99:1044-8.

8. Shetty A, Danielian P, Templeton A. A comparison of oral and vaginal misoprostol tablets in induction of labor at term. Br J Obstet Gynecol 2001;108:238-43.

9. Rasheed R, Ahsan A, Younus S, Raza F. Oral versus vaginal misoprostol for labor induction. J Pak Med Assoc 2007; 57:404-7.

10. Adair Cd, Weeks JW, Barrilleaux S, Edwards M, Burlison K, Lewis DF. Oral or vaginal misoprostol administration for induction of labor: a randomized, double blind trial. Obstet Gynecol 1998;92: 810-13.

11. Shetty A, Livingstone I, Acharya S, Rice P, Danielian P, Templeton A. Oral misoprostol (100 microg) versus vaginal misoprostol (25 microg) in term labor induction. A randomized comparison. Acta Obstet Gynecol Scand 2003 ;82:1103-06.

12. Abbasi RZ, Sirichand P, Rizvi S. Safety and efficacy of oral versus vaginal misoprostol for induction of labor at term. J Coll Physicians Surg Pakistan 2008;18:625-29.

13. Carlan SJ, Bouldins S. Safety and efficacy of misoprostol orally and vaginally. Obstet Gynecol 2001;98 :107-12.