

Use of Misoprostol for Induction of Labour

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Abstract

Background: To find out safety and efficacy of Misoprostol in induction of labour at term in women with live fetus through vaginal versus sublingual route

Methods: In this cross sectional study, total of 200 pregnant women at term (37-42 week) with live fetus were selected randomly for induction of labour with tab misoprostol. These women were divided in two groups with 100 women in each group. Misoprostol was administered in a dose of 50 microgram (1/4th tab), in group I through vaginal route and in group II through sublingual route. Maximum of three doses were given in 24 hours and resumed on next day if there was no improvement.

Results: Number of doses of misoprostol used for induction of labour was less than two in 68% cases in group I and 78% cases in group II, while more than two doses were used in 32% cases in vaginal group and 22% in sublingual group. Administration to induction interval was less than 12 hours in 60% cases in vaginal group and 80% cases in sublingual group. Total duration of labour was less than 8 hours, seen in more cases of sublingual group than vaginal group i.e. 56% versus 40%. Vaginal delivery was achieved in 60% cases in vaginal group and 70% cases in sublingual group with rate of caesarean section 40% versus 30% respectively. Regarding fetal outcome, fetal distress and meconium stained liquor was seen in 26% and 24% cases in vaginal and sublingual groups respectively, showing no significant difference between two groups. However neonatal intensive care unit (NICU) admissions were more in vaginal group than sublingual group i.e. 30% versus 20%. There were 100% live births in both groups with ENND (early neonatal death) 0% in each group. Maternal outcome was good in both groups. Uterine hyperstimulation was seen in 0% cases in each group while only two cases of fever were seen in sublingual group. There was no case of post partum haemorrhage (PPH) and no maternal death in both groups.

Conclusion: Misoprostol is effective for induction of labour at term with live fetus, more through sublingual than vaginal route. Its safety and efficacy can be further ensured by using lower dosage regimens.

Key words: Misoprostol, Induction of labor, Live fetus, maternal outcome, Fetal outcome

Introduction

Induction of labour is the artificial initiation of

uterine contractions prior to their spontaneous onset leading to progressive dilatation, effacement of the cervix and delivery of the baby. The purpose of induction is to achieve benefit to the health of mother and/or baby, greater than if the pregnancy continues¹. The use of agents to ripen cervix prior to conventional methods of induction is the standard practice. Prostaglandins are most frequently used for ripening the cervix and induction of labour. Extra amniotic prostaglandin E2 gel or vaginal pessary are currently the agents of choice, but are costly^{2,3,4}. A more affordable alternative, is to use misoprostol, for induction of labour. Misoprostol is a synthetic analogue of naturally occurring prostaglandin E1 originally manufactured for treatment of peptic ulcer. Misoprostol is an effective drug for ripening the cervix and induction of labour. Misoprostol tablets can be given orally or vaginally, but is not yet licensed for use in pregnancy. Misoprostol has also shown usefulness in many other obstetrical and gynaecological problems, but nevertheless the company, which holds the patent rights for misoprostol has so far never applied for approval for obstetrics. However the data on optimal regimens and safety are lacking⁵⁻¹⁰.

This study was planned to find out the efficacy and safety of misoprostol in cervical ripening, induction of labour, safe maternal and fetal outcome, vaginal delivery and minimal caesarean section rate.

Patients and Methods

It was a cross sectional comparative study. During a period of one year from Jan 2006 to Dec 2006, total of 200 obstetric cases were selected randomly for induction of labour with misoprostol in Gynae/ Obs. Department Unit 1 Holy Family Hospital Rawalpindi with following selection criteria: Gestation from 37 completed weeks onwards (Term), Pregnancies with live fetus and Bishop score less than 5. Exclusion criteria were Intrauterine deaths (IUD)s, Multiple pregnancies, Non-vertex presentation, Abnormal fetal heart rate, Previous scar and Preterm babies.

Ethical approval for use of misoprostol was obtained from Ethical Committee of the hospital.

Informed consent was taken from all patients included in this study.

We used 50 microgram dose (1/4th tab) of misoprostol in both groups. In group I, the dose was given through vaginal route and in group II through sublingual route. The dose was repeated 06 hourly. Maximum of three doses were given in 24 hours and resumed on next day in case of no improvement. In patients who achieved Bishop score > 7, labour was augmented with syntocinon drip. Fetal heart rate and uterine contractions were monitored at regular intervals. When cervix dilated 3cm, artificial rupture of membranes was done. Uterine hypertonus was defined as single uterine contraction lasting for ≥ 2 min, tachysystole as ≥6 uterine contractions in 10 min, and hyper stimulation as either hypertonus or tachysystole associated with an abnormal fetal heart rate pattern. Data collected through proformas was entered in computer and analyzed using SPSS.

Efficacy of misoprostol was judged by change of Bishop score, vaginal delivery rate in 24 hours, doses of misoprostol needed to induce delivery, caesarean section rate, fetal distress, maternal side effects and fetal outcome parameters.

Results

The results showed that in group I, there were 48 primigravidae and 52 multigravida. In group II, there were 54 primigravidae and 46 multigravida (table 1). The average age was 25±5 years. Number of doses used for induction of labour in group I(vaginal) were <2 in 68% cases and >2 in 32% cases. In group II (sublingual), < 2 doses were used in 78% cases and >2 doses in 22% cases (Table 1). Administration to induction interval in group I was <12 hours in 60% cases and >12hours in 22% cases with failed induction seen in 18%cases.while in group II administration to induction interval was <12 hours in 80% cases and >12hours in only 08% cases with failed induction seen in 12% cases(Table 2). Total duration of labour was less than 08 hours in 40% cases of vaginal group and 56% cases of sublingual group.Vaginal delivery was achieved in 60% of vaginal group and 70% cases of sublingual group.(Table 3).

Regarding fetal outcome ,fetal distress with meconium stained liquor was seen in 26% cases of vaginal group and 24% cases of sublingual group, showing no significant difference between two groups. The live birth rate was 100% in both groups. Although admissions in NICU were 18% in group I and 20% in group II, there were only 02 ENND in each group(Table 4).

Regarding maternal out come uterine hyperstimulation was seen in 02% cases in each group. There was no case of fever in group I, while it was seen in 02 cases in group II .There was no case of PPH and no maternal death in both groups

Table 1: Comparison of Obstetrical Findings

Obstetrical findings	Vaginal group(I)	Sublingual group (II)
Number of primigravida	48	54
Number of multigravida	52	46
Less than two doses used	68%	78%
More than two doses used	32%	22%

Table2: Administration To Induction Interval

Duration in hours	Vaginal group I	Sublingual group II
Less than 12	60%	80%
More than 12	22%	08%
Failed induction	18%	12%

Table 3: Comparison of Mode Of Delivery

Mode of delivery	Vaginal group(1)	Sublingual group (II)
Vaginal Delivery	60 %	70%
Caesarean Section	40 %	30%
Fetal Distress	32 %	12 %
Failed Induction	8 %	28 %

Table 4: Comparison of Fetal Out Come

Fetal out come	Vaginal group(1)	Sublingual group (ii)
Fetal distress	26 %	24 %
Meconium Passage	26 %	24 %
Still birth	0 %	0 %
* NICU Admission	18 %	20 %

* NICU: Neonatal Intensive Care Unit

Discussion

Pakistan is an underdeveloped country with low socio-economic condition. In different hospitals in

this country, prostaglandins are used for ripening and dilatation of cervix. Our study shows that a synthetic prostaglandin analogue misoprostol is effective for induction of labour. Neto et al in 1987 in Brazil presented their first report on misoprostol induced vaginal delivery¹¹⁻¹⁴. Since then many studies have suggested that per vaginal use of misoprostol is helpful for labour induction in unfavourable cervix. More than 45 randomised trials including more than 5400 women have found vaginal misoprostol to be more effective than oxytocin or vaginal prostaglandin E2 at effecting vaginal delivery within 24 hours¹⁵⁻¹⁷.

Our study shows that misoprostol is more effective when given by sublingual route than vaginal route. Similar results were found by Nahar that sublingual route reduced number of doses needed to induce labour. More women in vaginal group did not achieve vaginal delivery within 24 hours (38% versus 30%). More women in the sublingual group achieved vaginal delivery within 08 hours of randomization (56%) compared with 40% in the vaginal group. The caesarean section (LSCS) rate was lower in sublingual group (30%) compared with 40% in the vaginal group. However, Kelly and Alisa found same rate of C-section in both groups^{18,19}. The reason may be the different dosage regime in these studies.

Regarding fetal distress, there was no significant difference between two groups in our study (26% versus 24%). It can be further reduced by reducing dose of administration of misoprostol.

An interesting result of our study is that there was no still birth and only 02 ENND in each group. The cause of ENND found was hypothermia in one case. In other case, it was associated with uterine hyperstimulation. This again addresses the need of evaluating safe dosage regime of misoprostol. Maternal outcome was good in both groups. Uterine hyperstimulation was seen in 02% cases in each group.

Cochrane review 2004 by Alfircnic showed that vaginal route is associated with more risk of hyperstimulation¹⁸. Our study shows that maternal side effects like fever was more in sublingual group. The reason may be the more systemic side effects seen with this route. Other studies also found that vaginal misoprostol is well tolerated with less systemic side effects^{19,20}.

Conclusion

Misoprostol is effective for induction of labour at term with live fetus, more through sublingual route than vaginal route. Its safety and efficacy can be further ensured by using lower dosage regimes. More

studies are required to determine safe and optimal dosage of misoprostol for induction of labour.

References

1. Nahar S, Yasnur S. Use of misoprostol for induction of labour in unfavorable cervix in Eclampsia. *Pak J Med Sci* 2004; 20 : 181-85.
2. Deborah A, Wing M, Margaret M, Jones D, Ann Rahall M, Murphy T et al. A Comparison of misoprostol and PEG2 gel for pre induction cervical ripening and labour induction. *Am J Obstet Gynecol* 1995; 172:1804-10.
3. Varaklis K, Gumina R, Stubblefield PG. Randomized controlled trial of vaginal misoprostol and intracervical prostaglandin E2 gel for induction of labour at term. *Obstet Gynecol* 1995; 86: 541-64.
4. Harms K, Nguyen C, Toy EC, Baker B. Intravaginal misoprostol versus cervidil for cervical ripening in term pregnancies. *Obstet Gynecol* 2001; 97(4 suppl 1): 36.
5. Keirse MJNC. Prostaglandins cervical ripening: meta-analysis of worldwide clinical experience. *J Reprod Med* 1993; 38: 89-100.
6. Wing DA, Rahall A, Jones MM, Goodwin TM, Paul RH. Misoprostol: an effective agent for cervical ripening and labour induction. *Am J Obstet Gynecol* 1995; 172: 1811-16.
7. Valle GO, Sanchez-Ramos Z, Jordan CW, Gaudier F, Delke-I Use of misoprostol to expedite delivery in severe pre eclampsia remote from term. *J Matern-Fetal Med* 1996; 5(1): 39-40.
8. Sahin HA, Surucer R, Guvercinci M. A study of intravaginal misoprostol for induction of labour in toxemia of pregnancy. *Inter J Gynecol Obstetric* 2001; 75:3-9.
9. Mariani-Neloc, Leao EJ, Barelo EM, Kenj G, De Aquino MM. Use of misoprostol for labour induction in stillbirth. *Rev Paul Med* 1987; 105: 325-28.
10. Alisa B, Goldberg M, Deborah A, Wing D. Induction of labour. The misoprostol controversy. *Journal of Midwifery and Women's Health* 2003; 48(4): 244-48.
11. Sanchez Ramose L, Kaunitz AM, Wears RL, Delk I, Gandier FL. Misoprostol for cervical ripening and labour induction; A meta analysis. *Obstet Gynaecol* 1997; 89: 633-42.
12. Hakam O, Gurcam U, Nolkam Y. Misoprostol in labour induction. *J Obstet Gynaecol Res*, 2001; 27(1): 17-20.
13. Carlan SJ, Blust D, O'Brien WF. Sublingual versus intravaginal misoprostol administration for cervical ripening. *Am J Obstet Gynecol* 2002; 186: 229-33.
14. Ngai SW, Lin KL. Vaginal misoprostol compared with sublingual misoprostol in termination of pregnancy. *J Obstet Gynecol* 1997; 90 : 735-38.
15. Dickinson JE, Evans SF. A comparison of sublingual misoprostol with vaginal misoprostol administration in pregnancy termination. *J Obstet Gynecol* 2003; 101 ; 1294-99.
16. Kelly B, Shelly C. Misoprostol for women health. *J Obstet Gynecol* 2002; 99:316-32.
17. Alisa G, Philip D. Misoprostol and pregnancy. *N Engl J Med* 2001; 344 :38-47.
18. Alfircnic Z. Oral misoprostol for induction of labour (Cochrane Review). In: *The Cochrane library*, Issue 4, 2004. Chichester, UK: John Wiley and Sons Ltd.
19. Deborah A, Koker V. Randomized controlled trial of 50 microgram of misoprostol for induction of labour at term. *Arch Gynecol Obstet* 2001; 263(3):28-30.

20. Ghidni R, Richard H . A comparison of differing dosing regimens of vaginally administered misoprostol for labour induction. Am J Obstet Gynecol 1996; 175(1):158-64.