

MISOPROSTOL USE FOR CERVICAL RIPENING AND INDUCTION OF LABOUR IN A NIGERIAN TEACHING HOSPITAL

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ABSTRACT

Context: Induction of labor is always a challenge to many an obstetrician more so when the cervix is unfavorable.

Objectives: To determine the efficacy and safety of misoprostol in cervical ripening and labour induction.

Materials and Method: A prospective study spanning 2 years and involving 151 patients admitted for cervical ripening and induction of labor at Usmanu Danfodiyo University Teaching Hospital, Sokoto, Nigeria. 50microgram (mcg) of misoprostol was inserted vaginally every 4 hours until cervix became favorable or onset of labor.

Results: Main indications for induction of labour were prolonged pregnancy and hypertensive diseases of pregnancy. An average of 2 insertions of 50mcg tablet was used to achieve cervical ripening in 107 patients (71%) and 80% (120) had spontaneous labor within 10 hours of insertion. The mean insertion-labor interval was 7.86 hours (SD \pm 2.5). The average duration of labour was 9.36 hours (SD \pm 2.9). Vaginal delivery was achieved in 96% of the patients. Uterine hyperstimulation occurred in 9 patients but there was no case of uterine rupture.

Conclusion: Misoprostol was effective and safe in cervical ripening and induction of labor with a vaginal delivery rate of 96%. It should be an essential drug in obstetric practice especially in low resource settings.

Key Words: Misoprostol, cervical ripening, labor induction.

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INTRODUCTION

The success of induction of labour depends on the state of the cervix at the beginning of induction. Induction of labor before the cervix is favourable often results in prolonged labor and or failed induction with attendant increased risk of operative delivery and morbidity¹⁻³. The process of making the cervix favourable for induction of labour is called cervical ripening. Methods employed to ripen the cervix include: laminaria tent, intracervical Foley's balloon catheter, prostaglandin E₂ (Dinoprostone), and until recently prostaglandin E₁ (Misoprostol).

Misoprostol, a synthetic prostaglandin E₁ analogue was originally introduced for the treatment and prevention of peptic ulcer diseases but was also found to have some uterotonic qualities and cervical softening effect⁴. Misoprostol is available in tablet forms and has a shelf life of several years if kept at room temperature and in aluminum blister packs to prevent contact with air. The potential for misoprostol seemed immense, especially in the

developing world where product stability, cost and ease of use is crucial⁵. A Ugandan study on induction of labour in women with intrauterine fetal death found that the average cost of treatment with vaginal misoprostol was less compared with intravenous oxytocin⁶. Tabowei and Oboro also reported that misoprostol, as a pre-induction cervical ripening agent was more effective than intra-cervical catheter⁷. These characteristics should facilitate its use in low-resource settings.

The Usmanu Danfodiyo University Teaching Hospital, Sokoto, a tertiary health institution attends to patients that come directly for medical care aside referrals from primary and secondary health care facilities within and outside the state. The objectives of this study were to assess the efficacy and safety of misoprostol for pre-induction cervical ripening and induction of labor.

MATERIALS AND METHODS

This was a prospective study from September 2003 to August 2005. Misoprostol was formally introduced to the department in July 2003. Prior to this period, the main method of pre-induction cervical ripening in

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the unit was the extra-amniotic use of the balloon of the Foley's catheter⁸. Eligible women for the study were recruited from among patients that needed cervical ripening prior to induction of labour for various obstetric and non-obstetric indications. Patients with premature rupture of membranes with unfavorable cervix were also included in the study. The main exclusion criteria were patients with previous uterine scar, presenting part other than vertex and multiple pregnancies.

The misoprostol used was the 200mcg tablets (Cytotec[®]), which were easily cut into 4 quadrants, and each quartet contained 50mcg. The starting quarter (50mcg) was moistened with sterile water for injection and inserted into the posterior vaginal fornix and this was repeated every 4 hours until sufficient cervical ripening (Bishop score of more than or equal to 8) achieved or onset of uterine contractions and such patients were then transferred to the main labour room where they were monitored on the partograph. Patients with premature rupture of membranes and unripe cervix had misoprostol inserted after sterile speculum had confirmed the diagnosis.

Patients that had not achieved adequate cervical ripening or that had not gone into spontaneous labour after four quadrants (total dose of 200mcg) were re-evaluated. A few required additional doses to achieve the desired effect. For those that did not go into spontaneous labor following cervical ripening, oxytocin drip was started not earlier than 6 hours of misoprostol placement. Each patient's progress in labor was monitored closely and the outcomes were entered into the study pro forma.

RESULTS

151 patients that met the set criteria were recruited into the study. 48% (73) were primigravidae, 28% (42) were para 1-2, and 14% (21) were para 3-4 while 10% (15) were grand multiparae. The indications for the induction of labor are shown in Table 1.

Table 1: Indications for Induction of Labour

INDICATION	No	%
Postdatism	60	40
Pre-eclampsia	57	38
*PROM	15	10
*IUFD	15	10
Others	4	2
Total	151	100

*PROM = Premature Rupture of Membranes

*IUFD = Intra-uterine Fetal Death

Prolonged pregnancy and pre-eclampsia accounted for Most of the cases (78%) of cervical ripening and labor induction.

The gestational age ranged from 28 weeks to 42 weeks and the mean gestational age was 39.6 (SD+2.3) weeks. The mean Bishop's score at first insertion was 3.

The range of insertion of the 50mcg tablets was 1-5 with a mean of 2 insertions. 46% of the patients achieved favorable cervical dilatation after 4 hours of insertion and after the second placement 71% (107) had favorable cervix. 80% of the patients progressed to active phase labor. Only 16% (40) of patients who went into spontaneous labour required oxytocin augmentation.

The mean insertion-labour interval was 7.86 hours (SD ± 2.5). The mean duration of labour was 9.34 hours and 96% of the patients had vaginal delivery. Most of the cases of PROM were among those that went into active labor within 4 hours of first insertion and all but 2 had vaginal delivery. Five patients had emergency caesarean section done on account of fetal distress, failure to progress due to cephalo-pelvic disproportion or mal-position. Uterine hyperstimulation occurred in 9 patients but there was no uterine rupture. All the fetuses that were alive before the onset of cervical ripening except 4 had 5-minute Apgar scores greater than or equal to 7. There was one case of fresh stillbirth but no maternal death.

DISCUSSION

In this study we used low dose (50mcg) misoprostol, four-hourly for cervical ripening and induction of labor with 96% successful vaginal delivery rate. This vaginal delivery rate is higher than the 82% previously reported from the unit when Foley's catheter was the only means of ripening the unfavorable cervix⁽⁹⁾. The mean duration of labour of 9.34 hours (SD ± 3.2) is comparable to the 10.2 (SD ± 3.8) hours reported from Ghana⁽¹⁰⁾ that used the same dose of 50mcg at 4hourly intervals. It is however higher than the 7.1 (SD ± 3.3) hours in the study by Tabowei and Oboro⁽⁷⁾.

The induction-labor interval of 7.86 hours was significantly lower than 22.7 hours ($p < 0.05$) reported by Tabowei and Oboro in which 25mcg tablets were used. This is in support of the meta-analysis that found a shorter interval to vaginal delivery with the 50mcg doses when compared with the 25mcg doses⁽¹¹⁾. Two other studies that indirectly compared the 25mcg with 50mcg doses found shorter intervals for vaginal delivery in the 50mcg group⁽¹²⁾.

⁽¹³⁾The other attraction for the 50mcg regimen is the

ease with which the 200mcg tablet can be broken into 4 quartets in contrast to breaking it into 8 parts of 25mcg each. You might need a special instrument to get exactly 25mcg from the 200mcg tablet! There were no clinical evidence of puerperal sepsis in any of the cases of PROM that had misoprostol in this study, rather the onset and duration of labour was relatively fast. Most of these cases of PROM required only a single insertion to go into active phase of labour. Kwawukume and Ayertey reported similar findings ⁽⁹⁾. It could be considered an advantage especially that such a short labor might reduce the chances of infection.

Most of the cases of uterine hyperstimulation that were recorded in this study were amongst the early patients recruited and it coincided with the period when the tablets were not made wet before placement. We also observed very early in the study that it was not unusual to feel part of the previous tablet in the posterior fornix at the time of insertion of the next dose, which was not the situation when the tablet was made wet with water before placement. Hence, we reverted to wetting the tablet before placement like the Ugandan study ⁽⁶⁾. We postulate that the synergetic effect of a previous tablet that was not completely absorbed from the vaginal fornix and the newly inserted tablet might predispose to uterine hyperstimulation, if contractions were to start soon after the new placement. A randomized trial using wet and non-wet tablets is however required to confirm this hypothesis.

There has been considerable concern about the association between misoprostol induction and previous uterine scars ^(14, 15). Some workers have found the use of misoprostol to be a significant risk factor for uterine rupture in women attempting vaginal birth after Caesarean section ^(16, 17). The concern is even more serious in settings where resources for monitoring patients are limited. Even though during the study period, there was a case of a previous uterine scar that had misoprostol with successful vaginal delivery while awaiting an elective caesarean section ⁽¹⁸⁾, we would caution against its use in the presence of uterine scar until compelling evidence is made available.

In conclusion, we found misoprostol effective and safe for cervical ripening and labor induction. There is need for a well-controlled study to determine the effect of wetting the tablet before placement especially as it relates to the complication of uterine hyperstimulation.

REFERENCES

1. **Bishop EH.** Pelvic scoring for elective induction. *Obstet Gynaecol.* 1964; 24: 266-268.
2. **Macdonald D.** Surgical induction of labour. *Am J Obstet Gynecol.* 1970; 107: 908.
3. **Brindley BA, Sokol RJ.** Induction and augmentation of labour: Basis and methods for current practice. *Obstet Gynecol Surv.* 1988; 43: 730-743.
4. **Blanchard K, Clark SC.** Misoprostol for women's health: A review. *Obstetrics & Gynaecology.* 2002; 99(2): 316-332.
5. **Weeks A.** Clarifying the role of misoprostol in obstetrics. *African Health Sciences.* 2001; 1 (2): 52-54.
6. **Nakintu N.** A Comparative study of vaginal misoprostol and intravenous oxytocin for induction of labour in women with intrauterine fetal death in Mulago Hospital. *African Health Sciences.* 2001; 1(2): 55-59.
7. **Tabowei TO, Oboro VO.** Low-dose misoprostol versus intracervical balloon catheter for pre-induction cervical ripening. *East African Med J.* 2003; 80(2): 91-94.
8. **Ekele BA, Isah AY.** Cervical ripening: How long can the Foley catheter safely remain in the cervical canal? *Afr J Reprod Health* 2002; 6(3): 98-102.
9. **Ekele BA, Oyetunji JA.** Induction of labour at Usmanu Danfodiyo University Teaching Hospital, Sokoto. *Trop J Obstet Gynaecol.* 2002; 19(2): 74-77.
10. **Kwawukume EY, Ayertey RP.** The use of misoprostol for induction of labour in a low-resource setting. *Trop J Obstet Gynaecol.* 2002; 19(2): 78-81.
11. **Sanchez-Ramos, Kaunitz AM, Delke I.** Labour induction with 25ug versus 50ug intra-vaginal misoprostol: a systematic review. *Obstetrics & Gynaecology.* 2002; 99(1): 45-151.
12. **Wing DA, Jones MM, Rahall A, et al.** A comparison of misoprostol and prostaglandin E2 gel for pre-induction cervical ripening and labour induction. *Am J Obstet Gynecol* 1995; 172: 1804-1810.

- 13 **Wing DA, Rahall A, Jones MM, et al.** Misoprostol: An effective agent for cervical ripening and labour induction. *Am J Obstet Gynecol* 1995; 172: 1811-1816.
- 14 **Thompson AJ.** Elective induction of labour. Why, when and why? *The Obstetrician and Gynaecologist*. 1999; 1: 20-25.
- 15 **Wing DA.** Labour induction with misoprostol. *Am J Obstet Gynecol*. 1999; 181: 339-345.
- 16 **O'Brien-Abel N.** Uterine rupture during VBAC trial of labour: risk factors and fetal response. *J Midwifery Women's Health*. 2003; 48: 249.
- 17 **Plaut MM, Schwartz ML, Lubarsky SL.** Uterine rupture associated with the use of misoprostol in the gravid patient with a previous caesarean section. *Am J Obstet Gynecol*. 1999; 180: 1535.
- 18 **Airede LR, Ukwu AE.** Self-medication with vaginal misoprostol in a term pregnancy: case report. *Trop J Obstet Gynaecol* 2006; 23(1): 83-84.