Original Article

A Comparison of Orally Administered Misoprostol With Vaginally Administered Misoprostol For Cervical Ripening And Labour Induction

Siddique S[1], Howlader MJ[2], Saha J[3], Begum KS[4]

Abstract

Objective: *To compare efficacy and safety of oral misoprostol over vaginal misoprostol for labour induction.*

Materials and Methods: *This is a cross sectional interventional hospital based comparative study which was carried in the department of Obstetrics and Gynecology in DMCH from 01.07.2008 to 31.12.2008.*

Results: *Almost equal number of patients delivered vaginally spontaneously in both group, there is no association between route of administration and mode of delivery. Nausea,vomiting occurred more in oral group and uterine hypertonicity more in vaginal group.*

Conclusion: *In this study, 50 patients were randomly selected for oral group and 50 patients for vaginal group. There were no significant differences regarding age, duration of pregnancy, Bishop's score and indication of induction of labour.*

Key Words: *Misoprostol, Cervical Ripening, Labour Induction.*

Introduction

Induction of labour is a standard obstetric approach in properly selected patients by which pregnancy is terminated artificially any time after the age of viability. It is an integral part of modern obstetric practice and should be simple, safe, effective and preferably non invasive. Consistency, compliance and configuration of the cervix has a great role in case of success of induction[1]. Success of induction depends on period of gestation (at or near term), case profile (parous woman or in case of premature rupture of the membrane), sensitivity of the uterus and Bishop's scoring[2]. Common indication for induction of labour are prolong pregnancy, chronic hypertension, placental insufficiency, intra uterine death and congenital malformation of fetus[3]. Various mechanical and pharmacological methods have been used to ripen the cervix before induction of labour to increase the success rate[4]. Misoprostol, a synthetic PGE_1, analogue, was initially used to prevent ulcer in people who take NSAIDs including aspirin. It protects stomach lining and decrease stomach acid secretion[5].

Misoprostol is also a promising agent in cervical ripening either by oral route or vaginal route. Some study shows vaginal route was more efficacious compared to oral route. A slightly higher number of patients in the vaginal group had hyper stimulation and neonates required NICU admission[6]. Oral dose offer ease of dosing, avoidance of vaginal examination and potential for high degree of patient satisfaction. It could be potentially reduced over all hospitalization time by permitting administration of the medication in an out patient setting[7]

1. Dr. Sohana Siddique, Associate Professor & HOD, Dept. of Gynaecology and Obstetrics, Khwaja Yunus Ali Medical College & Hospital, Enayetpur, Sirajgonj.
2. Dr. Muhammad Jahangir Howlader, Assistant Professor, Dept. of Orthopaedics, Khwaja Yunus Ali Medical College & Hospital, Enayetpur, Sirajgonj.
3. Dr. Joysree Saha, Assistant Professor, Dept. of Gynaecology & Obstetrics, Popular Medical College & Hospital, Dhaka.
4. Dr. Kazi Shahnaz Begum, Assistant Professor, Dept. of Gynaecology & Obstetrics, MARKS Medical College and Hospital, Dhaka.

Materials and Methods

It was a cross sectional interventional hospital based comparative study which was carried out in the department of Obstetrics and Gynecology in DMCH from 01.07.2008 to 31.12.2008, based on total no of 100 pregnant women who satisfied the inclusion and exclusion criteria that was taken for study group.

Inclusion Criteria:

1. Single live foetus
2. Term pregnancy (37-42 weeks)
3. Intact membrane
4. Bishop's score ≤6
5. Cephalic presentation

Exclusion Criteria:

1. Cephalopelvic disproportion
2. Previous caesarean section or myomectomy
3. Malpresentation
4. Foetal distress
5. Low lying placenta
6. Placenta praevia
7. Ante partum haemorrhage
8. Vaginal infection.

The women were be randomly divided into 2 groups. One group was be given oral misoprostol where the participants take oral misoprostol 50 µg every 6 hourly. Another group was be vaginal group to whom 50 µg of tab misoprostol was introduce in the posterior fornix every 6 hourly. Cervical scoring was reassured after 4 hours. Collected data were complied, edited, analyzed by simple statistical method. After initial dose (50 microgram), it was repeated every 4 hourly in oral group and every 6 hourly in vaginal group. Decisions were made regarding pain relief, rupture of the membranes and the need of oxytocin augmentation when active labour achieved. In all subjects induction was done with continuous monitoring of uterine contractions and fetal heart rate. If labour progresses, then the subsequent misoprostol was withheld and labour observed.

Main Outcome Measures: The various important parameters that were looked for both groups are:

1. Occurrence of vaginal delivery within 24 hours from the start of induction,which was arbitrarily defined as successful induction.
2. Induction failure, or no vaginal delivery in 24 hours was defined as failure to achieve cervical dilation of ≥4 cm after a trial of oxytocin infusion.

Results

After collection, data were checked for consistency before entry in the SPSS and analysis. The results were presented in tables. The description highlights the main feature. In all there were a total of 100 pregnant women. Among them the total, 50 women were in oral group and 50 were in vaginal group.

Table 1: Table showing demographic characteristics of patients in oral and vaginal groups.

Characteristics	Oral Group (n=50)	Vaginal group (n=50)	Significance (P value)
Age (yr)	23.26 ±418	22.34±0.316	NS (0.218)
Gravidity	1.82±0.92	1.48±0.74	S-.044,t (90)=2.043
Parity	0.74±0.96	0.38±0.67	S-.033,t (98)=2.170
Gestational age (week)	39.93±1.42	40.19±1.38	NS (.355)
Initial Bishop's score	2.1±1.23	1.8±1.12	NS (.207)

Table 2: Table showing induction for induction of labour in the 2 groups.

Indications	Oral Group (n=50)	Vaginal Group (n=50)	Significance (P value)
Post dated	27 (54%)	24 (48%)	NS (.403)
Preeclampsia/eclampsia	9 (18%)	10 (20%)	
Oligohydramnios	2 (4%)	1 (2%)	
IUGR	4 (8%)	6 (12%)	
Pregnancy induced HTN	3 (6%)	-	
Others(less fetal movement, lower abdominal pain)	5 (10%)	9 (18%)	

Indications of labour induction in two groups were different though the difference was not significant statistically. Highest percentage of women was induced for postdated pregnancy. Pre-eclampsia and eclampsia was the second highest cause for induction for labour.

Table 3: Table showing mode of delivery after induction of labour in oral and vaginal groups.

Mode of delivery	Oral Group (n=50)	Vaginal Group (n=50)	Significance (P value)
Parity			*NS (.789)
Nulliparity	27 (54%)	35 (70%)	
Multiparity	23 (46%)	15 (30%)	
Spontaneous vaginal delivery	33 (66%)	32 (64%)	
Forceps			
Ventouse	2 (4%)	1 (2%)	
Caesarean section	15 (30%)	17 (34%)	

Large number of women delivered spontaneously in both groups. Yet the mode of delivery did not vary significantly between two groups. Two women in oral and one woman in vaginal group had ventouse delivery and none of them had forceps delivery.

Table 4: Table showing outcome of labour in oral and vaginal group resulting in spontaneous vaginal delivery.

Indications	Oral Group (n=50)	Vaginal Group (n=50)	Significance (P value)
No of patients who had spontaneous vaginal delivery	33 (66%)	32 (62%)	0.834
Mean inductiom delivery interval (hour)	8.31±6.67	6.61±6.33	.197 (t)
Mean doses (µg)	168±136.19	158±144.41	.722 (t)
No of patients delivered within 24 hours	50 (100%)	49 (98%)	.315
No of patients required oxytocin	3 (6%)	2 (4%)	.766
Mean time of delivery (Hour)			(t)
In nulliparous	13.57	10.47	0.086
In multiparous	10.89	10.12	0.599

Almost equal number of patients delivered vaginally spontaneously in both groups, there is no association between route of administration and mode of delivery. Nausea, vomiting occurred more in oral group and uterine hypertonicity more in vaginal group.

Table 5: Table showing indication of Caesarean delivery after induction of labour in 2 groups.

Indication	Oral Group (n=50)	Vaginal Group (n=50)	Significance (P value)
No.of patient delivery by caesarean section	15 (30%)	17 (34%)	
Failed trial	3	4	NS (.644)
Uterine hypertonicity	10	9	
Nausea,vomiting	----------	2	
Uncontrolled PET	2	1	
Tachysystole	----------	1	

Indication of caesarean section was nearly comparable in two groups for the indication of failed trial and fetal distress.uterine hypertonicity occurred in vaginal groups only.

Table 6: Table showing neonatal outcome in oral and vaginal group:

Outcome measures	Oral group n=50	Vaginal group n=50	Significance (P value)
Apgar score			NS (3.65)
In 1 minute	8.58	8.70	NS (1.56)
In 5 minutes	10	9.92	
Birth weight	292±.39	288±.35	NS (.536)
Meconeum passed	1	-	
Admission to ICU	1	2	
Neonatal infection	-	-	
Perinatal loss	-	-	

None of the groups suffered from neonatal infections. Apgar score at one minute as well as five minutes was good in two groups. None of the babies died.

Discussion

The need to ripe the cervix prior to induction of labour has become a reality in our lives as obstetrician. Analysis of the United States birth statistics shows 10% of all inductions required cervical ripening. The purpose of study was to highlight a simple method for ripening of cervix that may be suitable for an obstetrical unit, where a number of patients are referred for induction of labour. The study was designed to compare the efficacy of oral with vaginal misoprostol for induction of labour at term. In this study, 100 patients were studied by simple randomization. 50 in each group demographic and obstetric characteristics were compared between 2 groups. The indication of labour induction did not vary between 2 groups and this is correlated with other studies. Most women were induced due to post dated pregnancy. Eclampsia or Preeclampsis and Intra uterine growth restriction were next common causes. In a similar type of study by Hall et al[10], it was seen that the main induction indication was post dated pregnancy. Time interval between starting of induction eas less in vaginal group, through difference was not significant. This correlate with the study findings of Toppozada et al[8] (9.93. ±3.68 vs. 7.15±4.39). Other study results conducted by Carlan S J[5], How[11] and Fisher et al[12] showed that time required for vaginal group were significantly lower also. Parity and gravidity were significantly different in the 2 groups (P 0.033 and P 0.044).

This result is similar to the study finding of Hall et al[10] where parity was also different P(0.04). Pregnant women inthis study were selected at random. Therefore the finding does not make any deviation in result of the study. Mean gestational age of women in this study also comparable with gestational age of women in the study groups of Toppozada[8] (39.93±1.42wks vs 40.19±1.38 and 40.85±1.57 vs 40.30±1.87). Mean dose requirement was similar in vaginal and oral group(168±136.in oral[9] group vs 158±144.41). This finding is consistent with the findings of studies done by Hall et al[10] and Carlan SJ et al[5]. But the results of differs in vaginal administration were less in number than oral groups. In the present study same dose schedule was used for oral as well as vaginal group and it was 50 µg 6 hourly. Failed induction occurred in both groups though nearly equal in % (in oral 6% and in vaginal 8 %). Initial Bishop's score found in this study (2.1±1.23oral group vs 1.8±1.12) also correlated with the initial Bishop's scoreof the study done by Toppazada et al[8] (1.85 ±1.38 oral vs 2.25±1.68 vaginal). Spontaneous vaginal delivery occurred in 66% oral vs 64% in vaginal group in this study. Whereas these were 73% vs 77% and 70% vs 70%in Toppozada et al[8] and Hall et al[10] studies.

The percentage of CS was less in case of oral group (30%) than vaginal group (34%), this was not significant. This result is similar to the result of other studies[9,10,11,12]. Caesarean section rate was 3-4 times higher in case of nulliparous women (40.74% in oral group vs 42.86% in vaginal group) than multiparous women (17.39% in oral group vs 13.33 % in vaginal group).

Uterine hypertonicity occurred in vaginal group only in present study, in 4% case. In some studies it was found that uterine hyperstimulation or tacysystole were more in case of vaginal administration (Fisher et al[12] and Carian S J et al[5]). Some researchers found less uterine hyperstimulation in oral group (How HY et al[11]) while others mentioned that there was no difference between the routes of administration with respect to rates of hyperstimulation. Hyperstimulation in case of vaginal group may be due to higher dose. Higher rates of Caesarean section in this group though not statistically significant may also be due to higher dose. Maternal outcome was uneventful except for nausea and vomiting which occurred more in oral than vaginal group (20% and 10% in oral and vaginal group respectively). This result is consistent with the findings of Toppozada et al[8] (20% and 10% in oral and vaginal group respectively). Neonatal outcomes including APGAR scores, birth weight and admission to ICU did not show a significant difference. Another observation during this study period worthwhile to mention that oral administration of the tablets were quite acceptable to the patients while a few patients expressed theit dissatisfac tion during vaginal administration.

Conclusion

Misoprostol is not free from side effects. It may causes nausea, vomiting to life threatening events. In our study there was no significant differences between route of admistration, mode of delivery & complications. Close monitoring and immediate appropriate management of complications are to be considered mandatory during induction with Misoprostol where facility of emergency caesarean section is possible. Long term well designed clinical trial with a bigger sample size should be carried out to assess the safety, efficacy and acceptability of this new induction method.

References

1. Trofatter KF ,Browers D, stanby RN, Gall A , Killam AP.Pre induction cervical ripening with prostaglandin E 2 gel.AM J Obstet Gynecol 1985; 153:268-71

2. D.C. Dutta. Induction of labour- Textbook of Obstetric including perinatology and contraception.5th edition Calcutta: New central book agency (P) 2001.

3. Ozan H , Gurkan U ,Volkan Y, Melike O,Hana FK,Mephpara T.Misoprostol in labour production.J obst gynaecol Res 2001;27:17-20.

4. Yuen PM,Pang MYY, Chung CT and Chang A.Cervical ripening before induction of labour in patients with and unfavourable cervix;a comparative randomized study ot the atad ripening device, PGE2 vaginal pessary and PGE2 intracervical gel, Aust Nz J Obstet gynecol. 1996; 36:291-5.

5. Carlan SJ, Bouldin S, Blust D,O Brien WF safety and efficacy of misoprostol orally and vaginally; A randomized trial Obstet Gynecol 2001 july'98 (1) 107-12.

6. Rasheed R, Alam AA,Younus S, Raza F.Oral versus vaginal misoprostol for labour, induction.Dept. of Obs and Gynae; Kharadar General Hospital,Karachi 2007;August, 57(8):404-7

7. Calder AA , Embrey MP and Tait-T ripening of the cervix with extra amniotic PGE2 in visos gel before induction of labour Br.Obstet Gynaecol 1997; 84:264-8.

8. Toppozada MK, Anwar MY,Hasan HA, Gazaerly WS et al. Oral or vaginal misoprostol for induction of labour. Int J Gynaecol Obstet 1997;56:135-9.

9. Alfirevic Z Oral misoprostol for induction of labour;the Cochrane library issue 2 2002.

10. Hall R,Gardea MD and Harlass F.Oral versus vaginal misoprostol for induction of labour. Jun:99:1044-1048.

11. How HY, Leaseburge L.Khoury JC,Siddiqui TA,Spinnato JA,Sibai ,B M.AM J Obstet Gynaecol.2001 Oct;185(4);911-5

12. Fisher S A,Mackenzie Vp ,Davis GA. Oral or vaginal misoprostol for induction of labour ,a double blinded randomized controlled trial.