Scholars Journal of Applied Medical Sciences (SJAMS) **ISSN 2320-6691 (Online)**
Sch. J. App. Med. Sci., 2017; 5(10F):4227-4233 **ISSN 2347-954X (Print)**

(An International Publisher for Academic and Scientific Resources)
www.saspublishers.com DOI:10.36347/sjams.2017.v05i10.083

A Comparative Study of Oral versus Vaginal 25µg Misoprostol for Cervical Ripening and Induction of Labour in Prelabour Rupture of Membranes

Dr. Karuna Kanta Das[1], Dr. Bivarani Goswami[2], Dr. Abdul Hakim Anchari[3]
[1]Associate Professor, Department of Obstetrics and Gynaecology, Gauhati Medical College and Hospital, (Bhangagarh, Guwahati-781032) Under Srimanta Sankaradeva University of Health Sciences, Guwahati, Assam
[2]Assistant Professor, Department of Obstetrics and Gynaecology, Gauhati Medical College and Hospital, (Bhangagarh, Guwahati-781032) Under Srimanta Sankaradeva University of Health Sciences, Guwahati, Assam
[3]PG Student, Department of Obstetrics and Gynaecology, Gauhati Medical College and Hospital, (Bhangagarh, Guwahati-781032) Under Srimanta Sankaradeva University of Health Sciences, Guwahati, Assam

Original Research Article

***Corresponding author**
Dr. Abdul Hakim Anchari

Article History
Received: 25.10.2017
Accepted: 27.10.2017
Published: 30.10.2017

Abstract: The objective of the study is to compare the safety and efficacy of equivalent doses of orally and vaginally administrated misoprostol in induction of labour in Primigravida at 37-42 weeks of gestation with vertex presentation with prelabour rupture of membranes. 100 patients divided in oral, 50 cases (mean gestational age group 37 weeks 2 days) and vaginal group, 50 cases (mean gestational age group 38 weeks 3 days) received Tab. 25 µg of misoprostol every 4 hourly either orally or digitally administered in the posterior fornix in the vaginal group. Maximum up-to 6 doses in both groups. Primary outcome of the study was induction delivery interval in oral group 22.90 hours and in vaginal group 17.38 hours. The mean BISHOP score for oral and vaginal group was 4.6 and 5.7 respectively after 8 hours of administration of misoprostol. Vaginal group requires less oxytocin augmentation for delivery. APGAR score at 1 minute in oral group was 7.56 and for vagina group was 7.48. NICU admissions are statistically not significant. The mean induction delivery interval was significantly shorter in vaginal group, the cause of which could be longer duration action, no first pass metabolism and direct action of vaginal misoprostol on uterus on cervix. In oral group failed induction was observed in 6% cases, whereas in vaginal group, no induction failure was observed. Vaginal misoprostol is more effective than oral misoprostol for induction of labour.
Keywords: Primigravida, misoprostol, oxytocin

INTRODUCTION

Induced labour is one in which pregnancy is terminated artificially, any time after fetal viability is attained, by a method that aims to secure vaginal delivery. The aim of induction of labour has always been to improve the outcome when it is perceived that allowing the pregnancy to continue in its course, would present some jeopardy to the mother, her baby or both. The risk of induction should never be allowed to exceed the dangers of allowing the pregnancy to continue. The ideal inducing method should be safe for the mother and the fetus, inexpensive, easy, simple to use and reversible. The induction of labour has two components cervical ripening and stimulation of uterine contraction. To achieve dilatation of cervix and delivery of the fetus. It is well recognized that the success of induction of labour which ultimately aims at achieving the vaginal delivery depends to a great extent on the favourability of cervix or its rediness to go into labour. Misoprostol is a synthetic prostaglandin E1 analogue used originally for the prevention and treatment of peptic ulcer caused by the prolonged use of NSAIDs. Its use as a cervical ripener and labor inducer is upcoming and being tried enthusiastically by obstetricians worldwide. With time it has crossed the legal hurdles in Western as well as developing countries including India. It has advantage of being cheap, stable at room temperature and easy to be administered by various routes i.e. vaginal, oral, sublingual or rectal. Absorption by oral route is erratic, at the same time it is more rapid than vaginally administered misoprostol reaching peak serum concentration within 30 minutes compared to one hour with vaginal route. Oral misoprostol is eliminated rapidly (2-3 h) than vaginal ($\geq$ 4h). The success of induction of labour primarily depends on the status of cervix at the time of induction. A prepared/ripe cervix

has far better chance of successful induction of labour than an unripe cervix. A successful induction of labour leads to vaginal delivery of the infant in a good condition, in an acceptable time frame and with minimum maternal discomfort or side effects[3].

AIMS AND OBJECTIVES

AIM

The main aim of this study to compare safety and efficacy of equivalent doses of orally and vaginally administrated misoprostol in induction of labour in Primigravida at 37-42 weeks of gestation with vertex presentation with prelabour rupture of membranes

OBJECTIVES

- Induction to delivery interval
- Number of Doses required for delivery
- Need of Oxytocin augmentation for delivery
- Maternal Outcome
- Mode of Delivery
- Maternal Complications
- Foetal Outcome
- Meconium Stained Amniotic Fluid
- NICU Admissions

METHODOLOGY

- Cases for the present study were taken in the Department of Obstetrics & Gynaecology, Gauhati Medical College and Hospital, Guwahati from the period 1st June, 2016 to 31st May, 2017.

Study design

Prospective observational study

Inclusion criteria

Primigravida at 37-42 weeks of gestation with Vertex Presentation with Prelabour Rupture of Membranes.

EXCLUSION CRITERIA

- Multigravida
- Multiple pregnancy
- Pregnancy with medical disorder like heart disease, DM Etc.
- Pregnancy complications like placenta praevia, abruption placentae, IUGR,
- Polyhydramnios, Oligohydramnios etc.
- Case with Contraindications of prostaglandins.

The cases were divided into two groups of 50 each to receive misoprostol 25µg 4th hourly either by intravaginal or oral route. In all patients, the cervical status was assessed by using Bishop Score prior to induction.

After taking written informed consent about the route of administration of drug, mechanism of action of drug side effects of the drug, maternal and fetal complications, and detail history was taken. Baseline investigations were reviewed as per antenatal protocol. Expected dates were confirmed by history and serial (1, 2 and 3 trimester) USG. Clinical examination with per abdominal examination was done to confirm lie, presentation, gestational age and amount of liquor. Vaginal examination was done and BISHOP score was assessed.

The adverse effects like tachysystole, hypertonus and uterine hyperstimulation was watched for. Tachysystole was defined as 6 or more contractions in 10 min for 2 consecutive 10 minutes period. Hypertonous defined as single contraction lasting more than 2 minutes. Uterine hyperstimulation was defined as tachysystole as well as hypertonus uterine contraction associated with fetal tachycardia or bradycardia.

RESULTS

The present study is the analysis of 100 cases of Primigravida at 37-42 weeks of gestation with Vertex presentation with prelabour rupture of membranes admitted and treated in the Department of Obstetrics and Gynaecology, Gauhati Medical College and Hospital, Guwahati, Assam. The maternal outcome was observed and analysed during the period of hospital stay. The fetal outcome of 100 cases of prelabour rupture of membranes was observed and analysed up to the first week of neonatal life. The study covered a tenure of one year from 1st June, 2016 to 31st, May, 2017. The number of patients for the study were 100 divided into 2 group of 50 each either oral or vaginal. Qualitative data are expressed in the form of percentage and quantitative data as mean ± standard deviation, p-value.

Indication for Induction

Primigravida at 37-42 weeks of gestation with Vertex presentation with prelabour rupture of membranes.

Table-1: **showing mean gestational age**

	N	Mean Gestational Week	Min	Max	'F' Value	'p' value
Oral	50	38 w 3 days	37 w 2 days	40 w 6 days	0.992	<0.0001
Vaginal	50	38 w 2 days	38w 2 days	40w 4 days		

Vaginal Group

Mean gestational week for induction of labour was 38 weeks, 3 days

Oral Group

Mean gestational week for induction of labour was 38 weeks, 2 days

Table-2: Number of Doses of Drug Required for Delivery

Dose		Number of Dose				Total
	1	2	3	4	5	
Oral	2	10	24	9	5	50
	4.0%	20.0%	48.0%	18.0%	10.0%	100.0%
Vaginal	14	24	9	3	0	50
	28.0%	48.0%	18.0%	6.0%	0	100.0%

- Majority of cases (48%) required 2 doses in Vaginal Group
- Majority of cases (48%) required 3 doses in Oral Group

Table-3: Response to Drug in terms of Bishop Score

		N	Mean	SD	Min.	Max.	't' value	'p' value
Pre Induction Bishop	Oral	50	4.3	0.966	1	5	1.368	0.245
	Vaginal	50	3.3	1.326	1	5		
6 Hours Bishop Score	Oral	50	6.2	1.0	2	6	10.276	0.002
	Vaginal	50	5.7	1.744	3	7		

For Vaginal group

Mean bishop score was 5.70 after 8 hours.

For oral group

Mean bishop score was 4.60 after 8 hours.

Table-4: Requirement of Augmentation with Oxytocin

Dose	Augmentation with Oxytocin		Total
	Yes	No	
Oral	30	20	50
	60.0%	40.0%	100.0%
Vaginal	16	34	50
	32.0%	68.0%	100.0%

For Oral Group

- 30 cases (60%) required augmentation

For Vaginal Group

- 16 cases (32%) required augmentation with Oxytocin
- Rest 34 cases (68%) did not require any augmentation

Table-5: Induction to Delivery Interval

N		Mean Induction to delivery Interval (Hrs.)	SD	Min.	Max.	't' value	'p' value
Oral	50	22.90	4.062	10	28	42.603	<0.001
Vaginal	50	17.38	4.389	8	26		

Induction to Delivery Interval

In oral group

Mean induction to vaginal delivery interval was 22.90 hours

In vaginal group

Mean induction to vaginal delivery interval was 17.38 hours

Failed Induction

The incidence of failed induction was 6% (3cases), reported in oral group only

Table-6: Mode of Delivery

Dose	Mode of Delivery				Total
	Normal	Caesarean Section	Forceps	Vacuum	
Oral	34	6	2	8	50
	68.0%	12.0%	4.0%	16.0%	100.0%
Vaginal	38	4	1	7	50
	76.0%	8.0%	2.0%	14.0%	100.0%

Mode of delivery

For oral group
68% (34 cases) proceeded for normal delivery
12% (6 cases) required LSCS intervention

For vaginal group
76% (38 cases) proceeded for normal delivery
8% (cases) required LSCS intervention

Liquor Characteristic

For Oral group
80% (40 cases) exhibited clear liquor
8% (4 cases) exhibited thick MSAF

For Vaginal group
76% (38 cases) exhibited clear liquor
8% (4 cases) exhibited thick MSAF

Table-9: Maternal Complication

			Maternal Complication			
Dose	Diarrhoea	Fever	TachySystole	Uterine hyperstimulation	No Complication	Total
Oral	3 (6.0%)	1(2.0%)	0 (.0%)	1 (2.0%)	45 (90.0%)	50 (100.0%)
Vaginal	0 (.0%)	2 (4.0%)	2 (4.0%)	2 (4.0%)	44 (88.0%)	50 (100.0%)

Maternal Complication

For Oral group
90% (45 cases) encountered no maternal complication

For Vaginal group
88% (44 cases) encountered no maternal complication

Table-10: APGAR score at 1 and 5 minutes

		N	Mean	Std. Deviation	Minimum	Maximum	'F' value	'p' value
APGAR at 1 min	Oral	50	7.56	1.013	4	8	0.159	0.691
	Vaginal	50	7.48	.995	5	8		
APGAR at 5 min	Oral	50	8.70	.735	6	9	0.081	0.776
	Vaginal	50	8.74	.664	7	9		

APGAR score

APGAR score of the neonate was recorded at 1 minute and 5 minutes after birth

For Oral Group

- Mean 1 minute score was 7.56
- Mean 5 minutes score was 8.70

For Vaginal Group

- Mean 1 minute score was 7.48
- Mean 5 minutes score was 8.74

Table-11: Neonatal Complications

Dose	Neonatal Complication		Total
	NICU Admission	No Complication	
Oral	4	46	50
	8.0%	92.0%	100.0%
Vaginal	5	45	50
	10.0%	90.0%	100.0%

For Oral Group

- 8% (4 cases) of neonates required NICU admission due to neonatal complication.

For Vaginal Group

- 10% (5 cases) of neonates required NICU admission due to neonatal complication

DISCUSSION

The present study is an analysis of the maternal and fetal outcome in 100 cases of misoprostol in induction in primigravida at 37-42 weeks of gestation with vertex presentation with prelabour rupture of membranes in the Gauhati Medical College and Hospital, Guwahati, Assam. In the present study, majority of cases were booked 81%, 62% cases were seen from the rural area and 38% from the urban area. Age and gestational age were compatible. Statistical analysis shows that difference in the mean gestational age was statistically insignificant (p=0.322).

Before induction of labour, cervical scoring was done by Bishop's score and for both the groups, next cervical scoring was done after 8 hours. Before administrating next dose of misoprostol, PV examination was done. Mean pre-induction bishop score for Oral group was 2.82 ± 1.466. For vaginal group, the mean value was 3.14 ± 1.262 which was statistically insignificant (p = 2.45). After 8 hours, the bishop score for oral group had a mean of 4.6 ± 1.714 and for vaginal group, the mean was 5.7 ± 1.717, which was statistically significant (p = 0.002). It indicates that the improvement in cervical score was significantly more in vaginal group as compared to the oral group after the first dose.

In the present study, it was found that 30(60%) cases in oral group and 16 (32%) cases in vaginal group required augmentation with Oxytocin. The difference was statistically significant (p = 0.005) indicating that oral administration of Misoprostol for induction of labour requires additional methods of labour augmentation, such as Oxytocin drips. The findings were consistent with the previous studies; Stephanie A. *et al.* [50], Sheikher C. *et al.*[33].

Induction to Vaginal Delivery Interval, the induction to delivery interval is one of the primary outcomes of the present study. In Oral group, the mean interval was 22.90 hours and the same in vaginal group was 17.38 hours. The difference is statistically significant (p < 0.001) and the findings were more or less same with the previous study Sheikher C. *et al.* [33], and Pratima Mittal *et al.*[40], indicating that vaginal route of administration leads to lesser induction to delivery interval as compared to the oral route.

In the present study, 3 cases (6%) in oral group failed to proceed to active labour, while there was no failure of induction in the vaginal group, though the difference was statistically insignificant (p = 0.079). it was consistence with the previous studies Shetty *et al.* and Sheikher C *et al.*[33].

In the oral group, 34 cases (68%) proceeded for unassisted vaginal delivery. Another 10 cases required assistance in terms vacuum and forceps. Of these, 8 (16%) required vacuum extraction and remaining 2(4%) required Forceps delivery.

In vaginal group, 38 (76%) cases proceeded to unassisted vaginal delivery and 8 (16%) cases required assistance in terms of vacuum and forceps. Majority of the assisted vaginal deliveries were meant to cut short the second stage of labour as these cases had Meconium stained liquor. The findings of Abbasi R.M. *et al.*[32], and Sheikher C. *et al.*[33], were in accordance with those of present study.

In oral group, a total of 6 cases (12%) required emergency LSCS and previous study show similar trend. Failed induction was the main reason for LSCS in oral group. There was no failure of induction observed in the vaginal group.

In the present study, in oral group, 80% of the cases had clear liquor. Of the remaining 10 cases (20%), 6 (12%) had thin Meconium Stained Amniotic Fluid (MSAF) and 4 (8%) had thick Meconium Stained Amniotic Fluid (MSAF). The findings of the present study is more less similar with the previous studies Shetty A. *et al.*[23] Stephanie *et al.*[31].

In the present study, 10% cases developed some kind of maternal complication in oral group and 12% cases were experienced maternal complications in vaginal group. The findings are same pattern and are consistent with the previous studies.

APGAR score in oral group, only 1 case resulted in APGAR score < 6 at 5 minutes and the vaginal group did not have any such case. These differences were statistically insignificant (p = 0.315). The findings of Khatri R. *et al.*[32], and Sheikher C. *et al*,[33] are similar with the present study.

In the present study, 4 cases (8%) developed neonatal complications. Of these, 3 required NICU admission for respiratory distress and 1 for Meconium stained condition and similar with the previous studies Stephan *et al.*[40], Wing A.D. *et al.*[41].

CONCLUSION

From the present study it can be concluded that the vaginal misoprostol is more effective in comparison to oral misoprostol for induction of labour when administered in similar dosage of 25µg. The vaginal

route requires laser dosage, the induction delivery interval and the incidence of failed induction is also less in this group. With respect to the neonatal outcome no significant statistical difference was noted in either of the groups.

REFERENCE

1. Tenore JL. Method of Cervical Ripening and Induction of Labour. Journal of American Academy of Family Physicians. 2003 May.
2. Cunningham FG, Leveno KJ, Bloom SL, Hoth JC, Rouse DJ, Sponge CY. Williams Obstetrics. 23rd Ed. Mc. Graw Hill; 2010. Chapter 22, Labour Induction; p500-508
3. Arias F, Daftary SN, Bhide AG. Practical Guide to High Risk Pregnancy and Delivery. 3rd Ed. Elsevier; 2008. Chapter 15, Abnormal Labour and Delivery; p373-390
4. Dutta DC. Textbook of Obstetric. 6th Ed. Central; 2004. Chapter 34, Induction of Labour; p520-526
5. Mishra R, Ian Donald's Practical Obstetrics Problems. 6th Ed. BI Publications; 2007; Chapter 25, Induction of Labour; p489-502
6. Arias F, Daftary SN, Bhide AG. Practical Guide to High Risk Pregnancy and Delivery. 3rd Ed. Elsevier; 2008. Chapter 11, Prolonged Pregnancy; p285-286
7. Keirse MJ. Natural prostaglandins for induction of labor and preinduction cervical ripening. Clinical obstetrics and gynecology. 2006 Sep 1;49(3):609-26.
8. Dale HH. On some physiological actions of ergot. J Physiol. 1906; 34: 163– 206
9. Bell WB. The pituitary body. BMJ. 1909; 2 : 1609–13
10. Page EW. Response of human pregnant uterus to pitocin tannate in oil. Proc Soc Exp Biol. 1943; 52 : 195–7
12. Theobald GW. The use of posterior pituitary extracts in physiological amounts in obstetrics. BMJ. 1948; 11 : 123–7
14. Karim SM, Trussell RR, Patel RC, Hillier K. Response of pregnant human uterus to prostaglandin-F2α-induction of labour. Br Med J. 1968 Dec 7;4(5631):621-3.
15. Morrow JD, Roberts LJ. Lipid-derived autacoids: eicosanoids and platelet-activating factor. Hardman JG, Limbird LE, Gilman AG-Goodman & Gilman's The Pharmacological Basis of Therapeutics. New York, McGraw-Hill. 2001:669-85.
16. Eliasson R. Studies on PG occurrence, formation and biological actions. Acta Physiol. 1959; 46(158) : 1-73
17. Karin V. Proceedings of National Academy of Science of USA. 2001 Aug
18. Collins PW. Medicinal Research Reviews. 1990; 10(2) : 149-172pp
19. Cunningham FG, Leveno KJ, Bloom SL, Hoth JC, Rouse DJ, Sponge CY. Williams Obstetrics. 23rd Ed. McGrawHill; 2010. Chapter 6, Parturition; p150-165
20. Carlan SJ, Bouldin S, O'Brien WF. Extemporaneous preparation of misoprostol gel for cervical ripening: a randomized trial. Obstetrics & Gynecology. 1997 Dec 1;90(6):911-5.
21. Hingorani BN. Randomized clinical trial with oral PGE2 tablets and intravenous oxytocin for induction of labour. J Obstet Gynaecol India. 1988; 38 : 659
22. Lewis JH. Summary of the 29th Meeting of the Gastrointestinal Drugs Advisory Committee, Food and Drug Adminstration. Am J Gastroenterol. 1985 June; 80 : 743-745
22. Rabe T, Basse H, Thuro H, Kiesel L, Runnebaum B. Effect of the PGE1 methyl analog misoprostol on the pregnant uterus in the first trimester. Geburtshilfe und Frauenheilkunde. 1987 May;47(5):324-31.
23. Toppazada MK, Anwar MYM, Hassan HA, El-Gazaerly WS. Oral Misoprostol Vs Vaginal Misoprostol for cervical ripening and labour induction. International Journal of Gynaecology and Obstetrics. 1997 Feb; 56(2): 135-139
24. Shetty A, Peter D, Allan T. Oral Vs vaginal misoprostol for induction of labour. British Journal of Obstetrics and Gynaecology. 2001 March; 108(3): 238-243
25. Kwon JS, Gregory ALD, Machenzie VP. Comparision of Oral and Vaginal Misoprostol for Induction of Labour at Term. British Journal of Obstetrics and Gynasecology. 2001; 108(1) : 23-26
26. Hall R, Duarte GM, Harlass F. Journal of Obstetric Gyenaecology. 2002 June; 99 : 1044
27. Bartusevicius A, Barcaite E, Nadisauskiene R. Oral, vaginal and sublingual misoprostol for induction of labor. International Journal of Gynecology & Obstetrics. 2005 Oct; 91(1) : 2-9
28. Iris CM, Kaytha C, Kennith H, Maurice LD,Taslimi M. Prospective randomized clinical trial of inpatient cervical ripening with stepwise oral misoprostol vs vaginal misoprostol. American Journal of Obstetrics and Gynecology. 2005 March; 192(3) :747-752
30. Feitosa FE, Sampaio ZS, Alencar CA, Amorim MM, Passini R. Sublingual vs. vaginal misoprostol for induction of labor. International Journal of Gynecology & Obstetrics. 2006 Aug 31;94(2):91-5.
31. Sarani ST. Journal of Bangladesh College of Physicians and Surgeons. Official Journal of the Bangladesh College of Physicians and Surgeons. 2008 Jan;26(1).

32. Rasheed R, Alam AA, Younus SR. Oral versus vaginal misoprostol for labour induction. J Pak Med Assoc. 2007 Aug; 57(8) : 404-7
33. Cheng, S, Ming H, Lee, J. ACOG. 2008 Jan; 111(1) : 119-125
34. Abbassi RM, Sirichand P, Rizvi S. Safety and efficacy of oral versus vaginal misoprostol use for induction of labour at term. J Coll Physicians Surg Pak. 2008 Oct; 18(10) : 625-9
35. Sheikher C, Suri N, Kholi U. Comparative Evaluation of Oral Misoprostol, Vaginal Misoprostol and Intracervical Folley's Catheter for Induction of Labour at Term. JK SCIENCE. 2009
36. Aaron BC, Jennifer RB. Postterm Pregnancy. http://emedicine.medscape.com/article/261369-overview. 2010
37. Hofmeyr GJ, Gülmezoglu AM, Pileggi C. Vaginal misoprostol for cervical ripening and induction of labour. The Cochrane Library. 2010 Oct.
38. Mehrotra S, Singh U, Gupta HP. A prospective double blind study using oral versus vaginal misoprostol for labour induction. J Obstet Gynaecol. 2010; 30(5) : 461-4
39. Tripathy KD. Essentials of Medical Pharmacology. 6th ed. Jaypee; 2008. Chapter 13, Prostaglandins, Leukotriens and Platelet Activating Factor; p173-183
40. Pratima Mittal. Pratima Mittal, Sanskriti Priya, Kavita Agarwal, Rupali Dewan, Sunita Singhal Department of Obstetricians and Gynaecologists, VMMC & Safdarjung Hospital, 2010. New Delhi- 110029, India.