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Original Research Paper

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COMPARATIVE STUDY OF ROLE OF ORAL AND VAGINAL MISOPROSTOL FOR INDUCTION OF LABOR AT TERM

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ABSTRACT

Background- Aim of successful induction is to achieve vaginal delivery with fetus delivered in good condition within an acceptable time frame and minimum maternal side effects. The study was undertaken to assess the role of tablet Misoprostol in both routes of induction (oral and vaginal) on maternal and fetal outcome.

Objectives-

- To compare induction delivery interval by oral and vaginal routes of misoprostol administration.
- To compare the need of Injection Oxytocin to augment the labour in oral and vaginal routes of misoprostol administration.
- To compare the rate of LSCS in oral and vaginal routes of misoprostol administration.
- To compare neonatal outcome in terms of APGAR score, meconium stained liquor and admission to NICU.
- To evaluate maternal outcome in terms of maternal tachycardia and uterine hyper stimulation by oral and vaginal routes of administration.

Material and method: It is a comparative study of 2 years duration. Total 170 patients were included in the study. 85 patients were included in vaginal group and 85 in oral group. Labour and delivery parameters like Induction delivery interval, number of doses used and Oxytocin augmentation were compared. Fetal criteria like presence of meconium, abnormal CTG, APGAR score NICU transfer were evaluated.

Result – The following observations were made.

- The induction-delivery interval was less in the vaginal group.
- Need for Inj. Oxytocin to augment labour was lesser in vaginal group.
- The rate of LSCS was more in the vaginal group.
- Incidence of meconium stained liquor was more in vaginal group.
- NICU admission was not significantly required in any of the groups.
- There was no significant difference in intra and post-partum maternal complications.

Conclusion – Based on this study, it does appear that oral misoprostol may be an effective induction agent that is well tolerated orally because of its ease of usage, less changes for caesarean section, less chances of meconium stained liquor, but the induction – delivery time interval was found to me more. However there is no significant difference in the maternal and foetal outcome in both the groups.

KEYWORDS : Oral Misoprostol, Vaginal Misoprostol, Labour Induction, Injection Oxytocin, Induction-Delivery Interval

A.INTRODUCTION

Induction of labour means deliberate termination of pregnancy beyond period of viability by any method which aims at initiation of labour and vaginal delivery. It is indicated when there is risk of continuation of pregnancy to the mother or the fetus.

About 20% of pregnant women will have labour induced for a variety of reasons. Induction does not usually involve just a single intervention but it is a complex set of intervention and as such presents challenges for both clinicians and the mother.[1]

Induction is like a double edged sword, in other words, the more we try to interfere with normal spontaneous onset of labour and there are chances that we may land up into increase rate of caesarean, instrumentation delivery or psychological disturbances.

Elective induction does not increase the rate of caesarean when guidelines are met. Society of Obstetricians and Gynaecologist in Canada states that induction of nulliparous is associated with the chance of caesarean birth as compared with spontaneous labour.[2] ACOG suggest that labour may be induced for logistic reasons, including risk of rapid delivery, distance from hospital and psychological reasons.

Different methods for induction are continuous oxytocin infusion, synthetic prostaglandin E2 and synthetic prostaglandin E1 analogs and mechanical cervical dilators.[3-5]

Oxytocin as an inducing agent is more effective on ripened cervix. Mechanical dilators for example Foley's catheter bulb is more invasive and hence, prostaglandins are preferred choice in both ripened and un-ripened cervix. Prostaglandin E2 (dinoprostone) is expensive and requires continuous refrigeration and as prostaglandin E1 (misoprostol) is stable at room temperature and inexpensive and is widely used agent for induction of labour. Misoprostol available in tablet form is a synthetic 15-deoxy – 16 hydroxy -16 methyl analogue of naturally occurring prostaglandins E1 popular for stability at room temperature.[6-8]

It was initially introduced as the treatment of NSAID induced gastric ulcer. Misoprostol 200mcgm tablet, 4 times a day is given for prevention of gastric ulcer in patients who are taking NSAIDS for long term and are at risk for NSAIDS induced gastric ulcers. Diarrhea is a frequently observed side effects but it is mild and does not usually force discontinuation of therapy.[9-10] Later on, FDA approved a new label for the use of misoprostol during pregnancy.[11] It has also been used for many years for first and second trimester pregnancy terminations and induction of labour because it acts as utero-tonic and softens the cervix by increasing proteoglycan content.

American College of Obstetricians and Gynecologists (ACOG) confirmed its efficacy and safety in cervical ripening, induction of labour and therapy of postpartum haemorrhage.

B.MATERIALS AND METHODS

After obtaining all the ethical permissions from the College Ethical Committee, a comparative study on role of oral and vaginal misoprostol for induction of labor at term was done. The study was conducted on 170 patients who were admitted from for a period of total 2 years from 1ST September 2015 to 31ST September 2017 at Department of Obstetrics and Gynaecology. All the 170 patients selected for the study were Gravida women which reported to antenatal clinic or were admitted with gestation age in the range of 37-42 weeks. The patients were randomly allocated into 2 groups by random number computer table.

Group 1 (Oral group): The dose of misoprostol orally was 50µg and was repeated every four hourly for a maximum of four doses.

Group 2 (Vaginal group): The dose of misoprostol vaginally was 25µg and repeated every four hourly for a maximum of four doses.

I. Inclusion criteria: Patients with
a) Age 18 – 35 years
b) Gestational age 37 – 42 weeks
c) Singleton pregnancy
d) Cephalic presentation
e) Intact or early rupture of membranes

II. Exclusion criteria
a) Age <18 and >35 years
b) Previous caesarean section
c) Ante-partum hemorrhage (Placenta praevia, abruption placenta)
d) Eclampsia
e) Pre- eclampsia

The doses (oral/vaginal) were repeated till effective uterine contraction (more than 3 contraction in 10 minutes), cervical dilatation of 3 centimeter and Bishop's score of 8 was achieved. Patients were monitored for uterine contraction and fetal heart rate during this period. Per-vaginal examination was done at four hours and eight hours following drug administration or earlier if the patient complained of draining per vaginum or labour pains.

Oxytocin infusion was started in active phase of labour. Maternal pulse rate, blood pressure and fetal heart rate were monitored every 30 minutes from time of induction. Process of labour was assessed though partogram by noting the strength and duration of uterine contraction decent of presenting part, dilatation and effacement of cervix.

The information related to different variables were collected from inpatient case file, labour room register, operation theatre register, neonatal ward register and records kept in hospital medical record department. The relevant data related to individual case was entered in study proforma. The data was compiled and then transferred to excel sheet. Analysis was done using SPSS version 20 (IBM SPSS Statistics Inc., Chicago, Illinois, USA) Windows software program. Descriptive statistics included computation of percentages, means and standard deviations. The independent t test (for quantitative data within two groups) was used for comparison of all clinical indicators. Chi-square test used for qualitative data whenever two or more than two groups were used to compare. Level of significance was set at $P \leq 0.05$.

C.OBSERVATION AND RESULTS

A total of 85 patients were included in both the groups out of which primipara patients were 59 in Oral group and 57 in Vaginal group. Multipara patients were 26 in Oral group and 28 in Vaginal group (Table-1).

DISTRIBUTION OF STUDY GROUP ACCORDING TO PARITY (Table 1)

Study Group		Obstetric history		Total
		Primipara	Multipara	
Oral	Count	59	26	85
	Percent	69.4	30.6	100.0%
Vaginal	Count	57	28	85
	Percent	67.05	32.95	100.0%
Total	Count	116	54	170
	Percent	68.2	31.8	100.0%
X2=12.32, p value=0.34				

Full Term Normal Delivery (FTND) was performed on 51 (60%) patients of Vaginal group and 66 (77.6%) patients of Oral group. LSCS was performed on 34 (40%) patients of Vaginal group and 19 (22.4%) patients of Oral group (Table-2).

COMPARISON OF MODE OF DELIVERY IN BOTH GROUPS (Table 2)

Study Group		Mode of Delivery		Total
		FTND	LSCS	
Vaginal	Count	51	34	85
	Percent	60%	40%	100.0%
Oral	Count	66	19	85
	Percent	77.6%	22.4%	100.0%
Total	Count	117	53	170
	Percent	68.8%	31.1%	100.0%
X2=12.32, p value=0.01 (S)				

In the vaginal group, total 34 patients underwent LSCS out of which 18 for failure of induction and 16 for fetal distress. In the Oral group, 19 patients underwent LSCS out of which 9 for failure of induction and 10 for fetal distress. The rate of LSCS was found to be more in the Vaginal group (Table- 3).

COMPARISON OF INDICATION FOR LSCS AMONG GROUPS (Table 3)

Group		Indication for LSCS		Total
		Failure of Induction	Fetal distress	
Oral	Total	9	10	19
	Percent	47.36%	52.63%	100.0%
Vaginal	Total	18	16	34
	Percent	52.9%	47.05%	100.0%
Total	Total	27	26	53
	Percent	50.9%	49.06%	100.0%
X2=8.34, p value=0.03 (S)				

None of the patients in either group has any intra-partum complications. In the Vaginal group 2 patients had post – partum hemorrhage In the Oral group - 1 patient had post – partum hemorrhage. 3 babies out of 85 babies in each group needed NICU admission.

In Oral group – 39 out of 85 patients (that is – 45.9%) were induced for PROM, 3 out of 85 patients (that is – 3.5%) were induced for PIH and 43 out of 85 (that is – 50.6%) were induced for Postdate. In Vaginal group – 82 out of 85 patients (that is – 96.5%) were induced for Postdate and 3 out of 85 patients (that is – 3.5%) were induced for PIH.

The total (mean) dose of Misoprostol used in Oral Group – 120.03µg, the total (mean) dose of Misoprostol used in Vaginal Group – 68.63µg indicating that Vaginal Misoprostol is more efficient (p = 0.001) than Oral Misoprostol (Table-4).

COMPARISON OF TOTAL DOSE OF MISOPROSTOL USED IN BOTH GROUPS (Table 4)

Route	N	Mean	Std. Deviation	Minimum	Maximum	P value
Orally	85	(2.41x 50) 120.03	2.89	101.0	120.5	0.001 (S)
Vaginally	85	(2.76 x 25) 68.63	2.28	50.0	69.0	
Total	170	94.33	25.907	50.00	120.5	

According to the study Induction – Delivery Interval for – Oral Group is – 15hrs 26mins, Vaginal Group is – 14hrs 06mins which was not significantly different (Table-5).

COMPARISON OF INDUCTION - DELIVERY INTERVAL IN BOTH GROUPS (Table 5)

Route	Mean (Hours)	Std. Deviation	Minimum	Maximum	P value
Oral	15.26	8.88	0.00	28.30	0.31
Vaginal	13.66	11.46	0.00	28.50	

D.DISCUSSION

Misoprostol is being increasingly used for induction of labour since last few years because of its low cost and effectiveness and due to it's stability at room temperature. There have been different published reports of misoprostol use, through different routes (oral, vaginal and rectal) and in varying doses (25µg to 200 µg). Higher incidence of tachy-systole is reported with higher doses.[12]

In our study, there was no significant association between the two groups in terms of Parity, Neonatal outcome and Maternal

complications. In our study, 50µg Misoprostol was given orally or 25µg vaginally at interval of 4 hours. In the VAGINAL GROUP - the total dose of misoprostol required was 68.63µg and induction delivery interval was 14 hours and 06 minutes. In the Oral group the total dose of misoprostol required was 120.03µg and induction delivery interval was 15 hours and 26 minutes thus signifying the greater bioavailability of vaginal misoprostol. This finding is in agreement with Hafizur Rahman et all (2013) who found that the mean dose of vaginal misoprostol was less than the oral dose of misoprostol. This was a result of greater bioavailability of vaginal misoprostol.[13]

In our study more women in Oral group (44 out of 66 that is - 66.7%) required more oxytocin augmentation than in vaginal group (that is - 31 out of 52 which is - 59.6%). This finding is in agreement with Kwon et al (2001) who found that women in the oral group required significantly more oxytocin augmentation than vaginal group (78.2% Vs 50%), but is in contrast to Wing et al. (49.6% Vs 52.2%).[14]

In our study, total 8 out of 85 patients in vaginal group had meconium stained liquor as compared to only 5 out of 85 in oral group. In several studies, vaginal misoprostol had more number of meconium stained liquor. According to Uludag, this was 16.7%: 5.9%. [15] Increased meconium stained liquor in the vaginally induced group could be explained by the fact that vaginally absorbed misoprostol bypasses the hepatic and gastrointestinal metabolism and so achieves a higher concentration in plasma, increased by the cumulative effect following repeated administration of the drug. Higher concentration of the drug in plasma leads to uterine hyper stimulation and tachy-systole causing fetal hypoxia, relaxation of the anal sphincter and meconium stained liquor.[16] In contrast to this study, none of the patients in either group had hyper stimulation or tachy-systole in our study.

In our study there was no statistically significant deference in the APGAR score at 1 and 5 minutes of the neonates in both the groups and also only three babies from either of the group needed NICU admission. Dodd et al. (1998) and Carlan et al. (1998) also did not find significant differences in neonatal outcomes like in our study.[17,18]

None of the patients in our study had any statistically significant intra or postpartum complications. Minor side effects are common with higher doses. However, there are studies that have reported serious complications with misoprostol use. A systemic review by Wangner (2002) of 16 medico legal cases reported hyper stimulation in all cases, uterine rupture in 7 and hypoxic encephalopathy in 14 cases.[19] Thomas et al (2004) reported rupture uterus in a primigravida patient after the use of 100µg misoprostol (25µg 4 hourly).[20]

E.CONCLUSION

In our study, total 170 patients were included. 85 received Misoprostol vaginally and 85 received orally. The following observations were made.

- The induction-delivery interval was less in the vaginal group.
- Need for Inj. Oxytocin to augment labour was less in vaginal group.
- Incidence of meconium stained liquor was more in vaginal group.
- The rate of LSCS was significantly more in the Vaginal group.
- NICU admission was not significantly required in any of the groups and there was no significant difference between groups.
- There were no significant intra and post-partum maternal complications between groups.

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