Original Article

Frequency of Fetal Distress in Labour Induced with Mesoprostol in Comparison with Dinoprostone in Tertiary Care Hospital

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Abstract

Objective: The aim of this study was to compare the frequency of fetal distress in patients induced with Mesoprostol versus Dinoprostol administered at 6 hourly intervals.

Design: Cross – sectional comparative study.

Setting: This study was conducted at a tertiary care teaching hospital, Lady Aitcheson Hospital, Lahore.

Patients and Methods: A total of 200 patients, all primigravidas between 18 – 35 years of age undergoing induction at 41 weeks with alive pregnancy and an unfavorable Bishop Score, were included in this study. They were randomly divided into Misoprostol and Dinoprostone group, each containing 100 patients. Those postdates primigravidas were selected who have no evidence of any medical disorder or evidence of Intra Uterine Growth Retardation (IUGR).

Results: Out of Mesoprostol group 38% patients delivered vaginally and 62 % emergency caesarean sections were done with fetal distress in 35 patients. And in Dinoprostone group 40% patients were delivered vaginally and 60% emergency caesarean sections were done with fetal distress in 40 patients.

Conclusion: The incidence of fetal distress is significant when different inducing agents are used for induction of labor in patients with the same indication. Mesoprostol may be a better option in under developing country like ours, because it is cheep, easy to store, easily available, safe to administer and is not difficult to follow the patient after its use.

Key Words: Dinoprostone, Fetal Distress and Mesoprostol.

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Introduction

There is always a risk of fetal distress whenever labour is induced by artificial means. It has been long known that pharmacological agents that stimulate uterine contractions may over stimulate the uterus in labour to the point of shearing off the placenta, rupturing the uterus, causing the uterus to contract so hard and long that the baby is deprived of essential oxygen.[1] Fetal distress during labour can be detected by monitoring fetal heart rate, changes in Cardiotocography, fetal scalp blood pH, APGAR score at 5 minutes and admission of baby in intensive care unit (ICU).

Mesoprostol is a synthetic analog of prostaglandin E1 marketed as gastric cytoprotective agent. The drug is also an effective, safe and inexpensive agent for cervical ripening and labour induction, although it is not FDA approved for this purpose. Many studies have been done to check the safety of the drug for induction

of labor. When given orally it is rapidly absorbed through the gastro-intestinal tract and under goes de-esterification to its free acid, which is responsible for its chemical activity. The peak concentration and half life of Misoprostol acid, the active metabolite, are 12 minutes and 21 minutes respectively. The total systemic bioavailability of vaginally administered Misoprostol is three times greater than that of orally administered Misoprostol.[2,3] Certain studies have focused on identifying effective doses (the dose that is effective without causing uterine hyper stimulation). The consensus at this time is that 50mcg administered vaginally every 4 - 6 hours best achieves this balance.[4] Misoprostol is used as an effective labour inducing agent in the same way as oxytocin and Dinoprostone are used.[5] It has additional benefits of stability at room temperature, cost effectiveness and ease of oral administration.[6,7] In Pakistan it can be a cheaper way of induction of labour reducing labour costs if delivery occurs successfully.

Patients and Methods

This comparative study was carried out in the department of Obstetrics and Gynecology, Lady Aitcheson Hospital Lahore from Dec 2007 to Nov 2008. A total of 200 patients were selected. All were primigravida, postdates, 41weeks, between the age of 18 to 35 years with alive pregnancy and an unfavorable Bishop Score .These patients had no evidence of any medical disorder or intrauterine growth retardation. All those patients who were multigravidas, had Bishop Score more than 5, intrauterine death or fetal anomalies and patients with multiple gestations were excluded from the study. Preterm pregnancy and term pregnancy with spontaneous rupture of membranes were also excluded from the study. Detailed evaluation of the patients was done, by taking detailed history. Last menstrual period was confirmed with early Ultrasonography or pregnancy test. Patients were carefully evaluated for any evidence of medical disorders. Induction plan was explained to the patients and formal consent was taken. A total of 200 patients were selected, 100 in each group. The patients were randomly divided into 2 groups, Group I was induced with Mesoprostol and Group II with Dinoprostone. Before induction the patients were examined per abdominally and vaginal examination was performed to assess the Bishop score. Misoprostol in the dose of 50 µg at an interval of 6hours was used up to a maximum of 150µg (3 doses) was used and the dose of Dinoprostone was 2 mg and only two doses were used at an interval of 6hours. Continuous fetal heart monitoring with intermittent Cardiotocograph (CTG) and pinard fetoscope was done. Bishop score was done in all patients before induction. After each dose Bishop Score and CTG was repeated. Early artificial rupture of membranes (ARM) was done to see the color of liquor. These patients were augmented with syntocinon as per requirement. Any sign of fetal distress, deceleration in CTG, meconeum staining of liquor were taken as indicators of fetal distress and were noted. The outcome normal vaginal delivery (NVD), or lower segment caesarean section (LSCS) were noted and the indication of emergency caesarian section (C/S) were also noted. After delivery APGAR score at 5 minutes was noted and need for ICU admission was assessed.

Results

Among 200 patients 100 (50%) patients were induced with Mesoprostol (Group I) and 100 (50%) with Dinoprostone (Group II). All primigravidas which were post dates were induced. CTG was done before starting induction. Bishop score was done and was poor i.e. less than 5.

In group I only 38% delivered vaginally and 62% were delivered by emergency LSCS. In second group 40% patients delivered vaginally and 60% by emergency LSCS. In group one 35% patients underwent emergency LSCS for fetal distress whereas in group two 40% emergency LSCS were done for the same reason. There was not much difference in terms of fetal distress between the two groups (*p-value = 0.442*).

In group I, 5 babies were born with APGAR score < 7 out of which 3 babies were admitted in ICU. In group II, 4 babies were born with an APGAR score < 7 and only 2 needed admission in neonatal unit. APAR score of babies with fetal distress was insignificant among treatment groups (*p-value = 0.414*). The admission of baby in ICU for APGAR < 7 with Fetal Distress was statistically in-significant (*p-value > 0.05*). There were no mortalities reported in any of the groups. Also there was no early morbidity in any of these babies.

CTG changes were also noted in both groups in patients with fetal distress. In first group there was non-reactive CTG in 31 patients, early decelerations in 1 and late decelerations in 3 patients. In Group II, 21 patients showed non-reactive CTG, 8 early decelera-

tions and 11 late decelerations. In each of these patients CTG changes were associated with meconium staining of liquor.

Fetal scalp blood could not be done because of non availability of equipment and other facilities. Finally, the results are significant and meconium staining is higher in Group II (*p-value = 0.005*). The strength of association between mecinium grading and treatment group was 37% which was statistically significant (*p-value = 0.005*). CTC changes in cases with fetal distress among Group II were also statistically significant (*p-value = 0.001*). The strength of association between CTC changes and treatment groups was 39% with *significance value 0.001*.

Fetal scalp blood could not be done because of non-availability of equipment and other facilities.

Table 1: Comparison of mesoprostol with Dinoprostone.

		Mesoprostol (Group I)	Dinoprostone (Group II)	Total	*p-value*
Delivered vaginally		38	40	78	*0.442*
Emergency LSCS	Hyperstimulation	2	0	2	
	Fetal distress	35	40	75	
	Failure of progress	25	20	45	
Total		100	100	200	

Table 2: APGAR score of babies with Fetal distress, n = 75.

APGAR score	Mesoprostol (Group I)	Dinoprostone (Group II)	Total	*p-value*
< 7	5	4	9	*0.414*
> 7	30	36	66	
Total	35	40	75	

Table 3: Admission of baby in ICU for APGAR < 7 with Fetal Distress, n = 9.

Admission	Mesoprostol (Group I)	Dinoprostone (Group II)	Total	*p-value*
Yes	3	2	5	*0.643*
No	2	2	4	
Total	5	4	9	

Table 4: Meconium staining with Fetal distress, n = 75.

Meconium staining	Mesoprostol (Group I)	Dinoprostone (Group II)	Total	*p-value*
Grade I	1	6	7	*0.005**
Grade II	9	20	29	
Grade III	25	14	39	
Total	35	40	75	

Discussion

Although pregnancy and labor is a normal process which is controlled in such a way that at term labor starts spontaneously, but in 10% of pregnancies may be prolonged pregnancy in which labor needs to be initiated. For a long time oxytocin and progesterone has been used for induction of labor. Among progesterone PGE2 were used. Misoprostol PGE1 which was used for other purposes was noted to induce labour.[8] Since then many studies have been done to see its effects and efficacy, and safety for this purpose.[9-12]

Table 5: CTC changes in cases with Fetal distress, n = 75.

CTC changes		Mesoprostol (Group I)	Dinoprostone (Group II)	Total	*p-value*
Deceleration	Early	1	8	9	*0.001**
	Late	3	11	14	
Non reactive CTG		31	21	52	

Total	35	40	75	

In this study it is seen that Misoprostol is safe and fetal distress was noted in 35 patients as compared to 40 in Patients who were induced with Dinoprostone. Ramsy *et al* in their study showed that 55% of women treated with Mesoprostol an abnormal tracing event within first 24 hours of induction, compared to 21.1% with Dinoprostone. CTG abnormalities are more frequent with Misoprostol administration compared with Dinoprostone analogues.[13]

In another study carried out by HY Lee showed that maternal and fetal complications, mode of delivery, the need for oxytocin and pethidene were quite similar.[14] Our study also showed that number of vaginal deliveries and the number of emergency LSCS due to fetal distress is not statistically significant with both the drugs (*p-value = 0.442)*. But Misoprostol being cheep can be used in our country. Yet in another study done by Gupta and Mishra it was shown that C/S done for fetal distress were not significantly different with these drugs.12 for Dinoprostone and 10 for Misoprostol. While in our study it was 40 with Dinoprostone and 35 with Misoprostol. Nursery admission was 10 with Dinoprostone and 14 with Misoprostol[15] while in our study it was 2 and 3 respectively. In their study they had perinatal mortality of 1 and 2 with Dinoprostone and Misoprostol respectively whereas we had no perinatal mortality. They showed C/S rate of 26% with Dinoprostone and 12% with Misoprostol while in our study we had a C/S rate of 60 % with Dinoprostone and 62 % with Misoprostol which is quite high.

In a study done by Langenegger E, *et al* showed that there is no significant difference in respect of number of vaginal deliveries within 24 hours. The frequency of suspicious and pathological fetal heart rate pattern did not differ significantly.[16]

This study shows that Mesoprostol is cheep, effective easy to store at room temperature and can be used safely in developing countries instead of more costly treatments where temperature regulation is an added problem.

Conclusion

Mesoprostol is an affective labour inducing agent. It can be used successfully to decrease the no of c/s which can be decreased significantly if a good monitoring system and one to one care is available. The increased no of vaginal deliveries as a result of induction of labour with Mesoprostol can lower the cost and morbidity related to C/S.

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