

## COMPARISON BETWEEN DINOPROSTONE GEL AND MISOPROSTOL IN CERVICAL RIPENING AND INDUCTION OF LABOUR IN GUJARAT POPULATION

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### Abstract

**Background:** Induction of labor remains one of the major challenges in obstetrics even in the modern era. The ideal priming agents that cause cervical ripening and induce labor agents. Dinoprostone and misoprostol were administered, and their efficacy was compared. **Materials and Methods:** Out of 80 (eighty), 40 pregnant women admitted for birth induction were administered 50 µg of Misoprostol tablet, which was given intravaginally, and the remaining 40 women. Dinoprostone 0.5 mg gel: the same doses were repeated at 6 hours. Women who reached the active phase of contraction with cervical dilatation of at least 34 cm were administered with oxytocin. If active labor was not achieved within 24 hours, a cesarean section was performed. **Result:** Onset of labor was 40.28 minutes in the Misoprostol group and 1 hour and 38 minutes in the Dinoprostone group. In induction delivery intervals, the induction active phase is 1 hour and 42 minutes in the Misoprostol group. 4 hours, 27 minutes in the Dinoprostone group. Induction of delivery 4 hours, 4 minutes in the Misoprostol group and 10 hours, 46 minutes in the Dinoprostone group. Fetal distress was observed only in the dinoprostone group. **Conclusion:** It is confirmed that Misoprostol (PgE1) is a better option than Dinoprostone (PgE2) for inducing labor and cervical ripening for mother and fetus due to its efficacy, safety, and affordability.

## INTRODUCTION

Induction of labor is the non-spontaneous initiation of uterine contractions prior to their spontaneous onset leading to progressive effacement and dilatation of the cervix with descent of the presenting part to achieve vaginal delivery. When the continuation of pregnancy presents a threat to the life or well-being of the mother or her unborn fetus.<sup>[1]</sup> The drugs commonly available for the purpose of induction are misoprostol, dinoprostone, and oxytocin.<sup>[2]</sup> The cervical ripening is an essential prerequisite for induction and is assessed with Bishop scoring system when Bishop score exceeds 8; the likelihood of successful vaginal delivery approaches that of spontaneous labor, the duration of pregnancy being inversely correlated with the Bishop score.<sup>[3]</sup> Misoprostol is an effective synthetic PGE1, which is an important drug in obstetrics and gynecological practice because of its uterotonic and cervical priming actions. Intra-vaginal or intra-cervical administration of exogenous PGE2 dinoprostone is to promote cervical ripening and labor induction. Misoprostol is used in tablet form and dinoprostone as a gel.<sup>[4]</sup> Hence an attempt is made to evaluate and

compare the efficacy of both drugs for cervical ripening and induction of labor.

## MATERIALS AND METHODS

80 pregnant women regularly visited the Obstetrics and Gynecology department at Zydus Medical College Hospital, Dahod-389151, Gujarat were studied.

### Inclusion Criteria

Prima gravida women with singleton fetuses in cephalic presentation at or above 37 weeks of gestation with a Bishop score < 6 and a reactive fetal heart rate pattern. The patients who gave their consent in writing were selected for study.

### Exclusion Criteria

Women with previous cesarean sections, malpresentation, multiparity, placenta previa, previous uterine surgery, and abnormal fetal heart rate patterns were excluded from the study.

### Methods

Out of 80 (eighty) pregnant women admitted for birth induction, 40 were administered 50 µg of Misoprostol tablet, which was given intravaginally and retained in the posterior fornix after wetting

(group A) Dinoprostone 0.5 mg in gel form was administrated intracervically in the remaining 40 (forty) women (group B). In both groups, the same doses were repeated at 6-hour intervals, with a maximum of 3 doses. Women who had reached an active phase of uterine contraction with cervical dilatation of at least 34 cm were administered oxytocin. If active labor with uterine contraction was not achieved within 24 hours, it is considered a failed induction, and a caesarian section was performed. The duration of study was from January 2023 to December 2024.

**Statistical analysis:** Gestation age group in weeks, onset of labor induction delivery intervals, mode of delivery, and indications of LSCS were compared with percentages in both groups.

## RESULTS

### [Table 1] Comparative study of gestational age in both groups –

- 37-40 weeks: 35 (70%) in the Misoprostol group and 38 (86%) in the dinoprostone gel group.
- 40-42 weeks: 12 (30%) in the misoprostol group and 10 (25%) in the dinoprostone gel group.

### [Table 2] Comparative study of indication for induction of labor

- Post-term pregnancy: 13 (32.4%) in the Misoprostol group and 14 (35%) in the dinoprostone gel group.
- IUGR: 11 (27.5%) in the misoprostol group and 9 (22.5%) in the dinoprostone gel group.
- Gestational hypertension (preeclampsia): 16 (40%) in the misoprostol group, 17 (42.5%) in the dinoprostone gel group.

### [Table 3] Comparative study of onset of labor –

- All pregnancies: 42.28 minutes in the Misoprostol group, 1 hour 38 minutes in the dinoprostone group, mean difference 53-78 minutes
- In prima gravida pregnancies: 46.38 minutes in the misoprostol group, 1 hour 32 minutes in the dinoprostone group, mean difference 42.38 minutes
- In multigravid pregnancies: 40.22 minutes in the misoprostol group, 1 hour 23 minutes in the dinoprostone group, mean difference 50.28 minutes

### [Table 4] Comparative study of induction delivery intervals

- Induction to active phase: 1 hour 42 minutes in the Misoprostol group, 4 hours 27 minutes in the Dinoprostone group, mean difference 2 hours 16 minutes
- Active phase of delivery: 3 hours 2 minutes in the Misoprostol group, 4 hours 50 minutes in the Dinoprostone group, mean difference 1 hour 04 minutes
- Induction of delivery: 4 hours 04 minutes in the Misoprostol group, 10 hours 46 minutes in the

Dinoprostone group; the mean difference was 6 hours 8 minutes.

### [Table 5] Comparative study of mode of delivery and indication of LSCS –

- Normal vaginal delivery: 36 (90%) in the Misoprostol group, 27 (67.5%) in the Dinoprostone group
- Instrumental delivery: 2 (5%) in the Misoprostol group, 3 (7.5%) in the Dinoprostone group
- Cesarean section: 2 (5%) in the misoprostol group, 10 (25%) in the dinoprostone group
- Failure of induction: 1 (2.5%) in the misoprostol group, 6 (15%) in the dinoprostone group
- Meconium-stained labor: 1 (2.5%) in the misoprostol group, 2 (5%) in the dinoprostone group
- Fetal distress observed: 2 (5%) only in the Dinoprostone gel group.

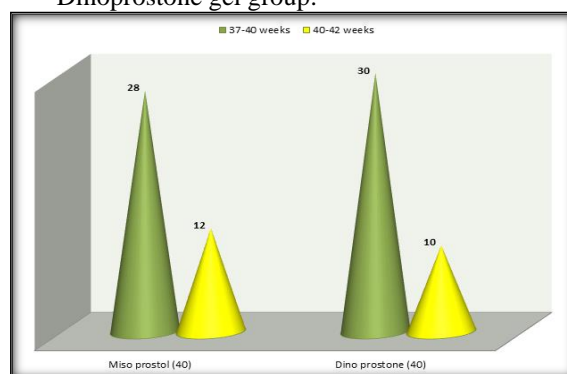


Figure 1: Comparative study of gestational age in both groups

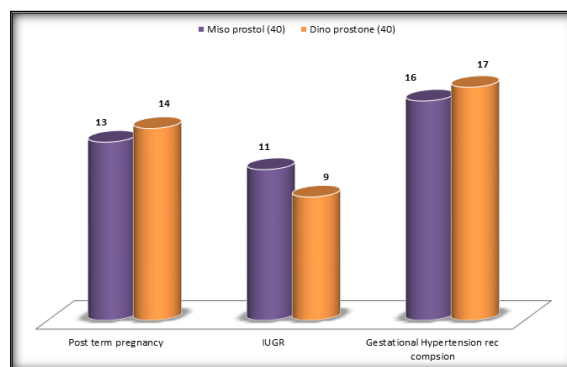


Figure 2: Comparative study of Indication for induction of labour

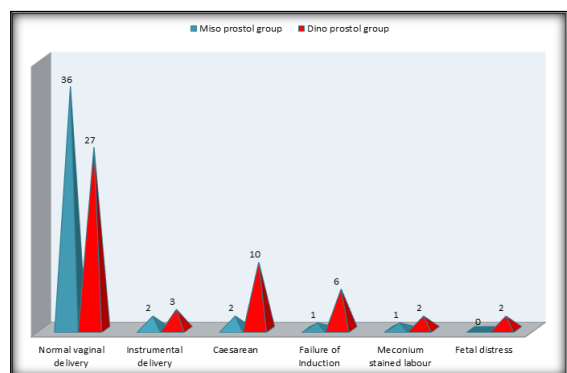


Figure 3: Comparative study of Mode of Delivery and Indications for LSCS

**Table 1; Comparative study of gestational age in both groups.**

Gestational age	Miso prostol (40)	Dino prostone (40)
37-40 weeks	28 (70%)	30 (75%)
40-42 weeks	12 (30%)	10 (25%)

**Table 2: Comparative study of Indication for induction of labour**

Gestational age	Miso prostol (40)	Dino prostone (40)
Post term pregnancy	13 (32.5%)	14 (35%)
IUGR	11 (27.5%)	9 (22.5%)
Gestational Hypertension rec compsn	16 (40%)	17 (42.5%)

**Table 3: Comparative study of onset of labour**

Categories	Miso Prostol tablet group	Dino Prostrol gel group	Mean Difference
In All Pregnancies	40-28 minutes	1 hour, 38 minues	53-78 minutes
In prima gravida pregnancies	46-38 minutes	1 hours, 32 minutes	42-38 minutes
In multi gravida	40-22 minutes	1 hour,23 minutes	50-28 minutes

**Table 4: Comparative study of induction delivery intervals**

Categories	Miso prostol group	Dino prostol group	Mean Difference
Induction to active phase	1 hours, 42 minutes	4 hours, 27 minutes	2 hours, 16 minutes
Active phase of delivery	3 hours, 2 minutes	4 hours, 50 minutes	1 hours, 04 minutes
Induction of delivery	4 hours, 04 minutes	10 hours, 46 minutes	6 hours, 8 minutes

**Table 5: Comparative study of Mode of Delivery and Indications for LSCS**

Categories	Miso prostol group	Dino prostol group
Normal vaginal delivery	36 (90%)	27 (37.3%)
Instrumental delivery	2 (5%)	3 (7.5%)
Caesarean	2 (5%)	10 (25%)
Failure of Induction	1 (2.5%)	6 (15%)
Meconium stained labour	1 (2.5%)	2 (5%)
Fetal distress	-	2 (5%)

## DISCUSSION

In the present comparative study between Misoprostol and Dinoprostone in the induction of labor, the gestation age study was 37-40 weeks, with 28 (70%) in the Misoprostol group and 30 (75%) in the Dinoprostone group; 40-48 weeks of gestation had 12 (30%) in the Misoprostol group and 10 (25%) in the Dinoprostone group [Table 1]. In the study of labor post-term pregnancy, 13 (32.4%) were in the misoprostol group and 14 (35%) were in the dinoprostone group. IUGR was 11 (27.3%) in the Misoprostol group and 9 (22.5%) in the Dinoprostone group. Gestational hypertension (preeclampsia) study: 16 (40%) misoprostol, 17 (42.5%) dinoprostone [Table 2]. In the comparative study of onset of labor in all pregnancies, 40.28 minutes in the Misoprostol group and 1 hour 38 minutes in the Diniprostone group [Table 3]. In comparison of induction delivery intervals, the induction active phase was 1 hour and 42 minutes in the Misoprostol group and 4 hours and 27 minutes in the Dinoprostone group. In induction of delivery, 4 hours 04 minutes in the Misoprostol group and 10 hours 46 minutes in the Dinoprostone group [Table 4]. Comparative study of mode of delivery and indications for LSCS—normal vaginal delivery 36 (90%) in the Misoprostol group and 27 (67%) in the Dinoprostone group, instrumental delivery 2 (5%) in Misoprostol, 3 (7.3%) in Doneprostone, and 2 (5%) in Misoprostol, 10 (25%) in Dinoprostol. Fetal distress was observed only in Dimoprostone 2 (5%)

[Table 5]. These findings are more or less in agreement with previous studies.<sup>5,6,7</sup>

It is also reported that the misoprostol group required less oxytocin augmentation than the dinoprostone group; on the other hand, it is also observed that a large quantity of misoprostol causes tachysystole of the uterus.<sup>[8]</sup> Hence, before the administration of Misoprostol, body mass index and cardiovascular health of pregnant women have to be taken into consideration; otherwise, it could be fatal for both mother and fetus as well. It is also reported that. In administration of Misoprostol, women have abnormal CTG (Cardiotocography) reports and meconium-stained amniotic fluid, which indicates hazards for the fetus.<sup>[9]</sup> Higher doses of misoprostol (50 mcg every 6 hours) were associated with a higher rate of FHR deceleration; hence, lower dosage is safer for the fetus and mother. Moreover, oral administration and vaginal administration of Misoprostol were studied; the vaginal group had lower rates of FHR abnormality and cesarean deliveries.

The pharmacokinetics of oral labor inducers differ from vaginal agents; oral misoprostol rapidly cleared from plasma and is of shorter life when compared to vaginal agents.<sup>[10]</sup>

The vaginal Misoprostol has been questioned for safety, especially for the fetus. It is observed that there is an increased risk of chorioamnionitis.<sup>[11]</sup> Hence, during administration of Misoprostol FHR must be under surveillance.

## CONCLUSION

The present comparative study between Dinoprostone gel and Misoprostol tablet (vaginal route) is more beneficial than Dinoprostone for inducing labor and early cervical ripening. Such studies must be conducted in a large number of patients in hi-tech obstetrics and gynecology hospitals to confirm the significant findings of the present study because the exact mechanism and factors that cause uterine contractions are still unclear.

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