

# Induction of Labour Misoprostol Vs Dinoprostone

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**Objective:** To compare the safety and efficacy of misoprostol with PGE<sub>2</sub> for induction of labor by intra vaginal administration **Study Design:** It was a comparative and interventional study **Study Venue:** The study was carried out in the Department of obstetrics & Gynaecology, Jinnah Hospital, Lahore. **Subjects and Methods:** 46 women with indications for labor induction at term and post-term were randomly assigned to two groups. Each woman received either 200µg of misoprostol or 3mg of prostaglandin E<sub>2</sub> intravaginally. If labor was not initiated after 4 h, the same dose was repeated every 4 h to a maximum of 400µg of misoprostol or 6mg of PGE<sub>2</sub>, until adequate labor and vaginal delivery was achieved or patients delivered by abdominal route. **Main Outcome Measures:** The main parameters measured were: latent period, time from induction to vaginal delivery, delivery route, and occurrence of uterine tonus alterations, hypoxia and neonatal morbidity. The statistical analysis of the data was carried out in SPSS software. **Results:** 23 women were allocated to the misoprostol group and 23 to the prostaglandin E<sub>2</sub> group. Misoprostol was more effective than PGE<sub>2</sub> in producing cervical changes. Delivery within 10-12 h, after the first administration occurred more often in the misoprostol group than in the PGE<sub>2</sub> [16 (69.56%) vs 2 (8.69%)]. Less patients in the misoprostol group required oxytocin augmentation than in the PGE<sub>2</sub> [3 (13.04%) vs. 5 (21.73%)]. Uterine tachysystole and hyperstimulation occurred more frequently in the misoprostol group [3 (13.04%)] than in the PGE<sub>2</sub> group [1 (4.34%)]. No statistically significant differences were noted between the two groups including mode of delivery and neonatal or maternal adverse outcome. The interval from induction to vaginal delivery was significantly shorter in the misoprostol group (6-8 hrs vs 11-12hrs). Abdominal delivery rate was more frequent in misoprostol group because of fetal tachycardia and hyper-stimulation than prostaglandin group [2 (8.69%) vs 1 (4.34%)]. Repeat dose was required mainly prostaglandin group [6 (26.08%)] as compared with misoprostol [4 (17.39%)]. **Conclusions:** Compared with prostaglandin E<sub>2</sub>, intracervical misoprostol is more effective in cervical ripening and labor induction at term. The higher frequency of uterine hyper-contraction associated with the use of misoprostol did not increase the risk of adverse intrapartum and neonatal outcomes, but the vigilant fetomaternal monitoring is considered to be essential in every case of induction.

**Key words:** Induction, Hyperstimulation, Post-term, Fetal tachycardia

Induction of labour, is an intervention in pregnancy in the interest of mother and /or fetus There are number of obstetric conditions known to carry specific risk to well being and survival of the fetus in utero and often these risks increase with advancing gestation. The most widely recognized examples of these are pre-eclampsia, diabetes, hydrops fetalis, placental insufficiency, increase maternal age and prolonged pregnancy<sup>1</sup>. Spontaneous labour is inevitable in all pregnancies but when labour induction is contemplated, the success is mainly dependant on the association with the spontaneous labour whether it is an imminent or distant prospect. For induction of labour to be effective, it is not sufficient simply to stimulate contractility of the myometrium. The induction methods endeavor as far as possible to replicate the events of normal parturition. In addition to generating myometrial contractility, it must induce the changes of cervical ripening, if these have not occurred naturally.

Cervical ripening is seen as essential requirement for successful induction of labour<sup>1, 2</sup>. Oxytocin represents a very important agent for the stimulation of myometrial contractility, however it success depends heavily on the degree of cervical ripeness. Cervical ripening is most effectively accomplished by local administration Prostaglandins E<sub>2</sub> (Dinoprostone) as well as E<sub>1</sub>

(Misoprostol). Misoprostol is a synthetic E<sub>1</sub> methyl analogue prostaglandin, is at present receiving attention as a cervical modifier and labour induction agent. However, there is still a need for better determination of its safety and effectiveness<sup>3</sup>. Our study was conducted to compare the efficacy and safety of these two Prostaglandins (E<sub>1</sub> & E<sub>2</sub>) for labour induction.

## Subjects and methods:

46 women with indications for labor induction at term and post-term were randomly assigned to two groups. Each woman received either 200 µg of misoprostol or 3mg of prostaglandin E<sub>2</sub> intravaginally. If labor was not initiated after 4 hours, the same dose was repeated every 4 hours to a maximum of 400µg of misoprostol or 6mg of PGE<sub>2</sub> until adequate labor and vaginal delivery was achieved or patients delivered by abdominal route.

## Main outcome measures:

The main parameters measured were: latent period, time from induction to vaginal delivery, delivery route, and occurrence of uterine tonus alterations, hypoxia and neonatal morbidity. To verify the statistical significance of the differences the percentage and student t test were applied in computer software (SPSS).

**Results:**

Most common age group of the women for labour induction was between 30 to 35 years (45.65%). For labour induction different age groups of women are shown in Table I. Women for labour induction were mostly primigravida (63%) but there were multiparous women as well (Table II).

Table I Age group for Induction of Labour

Age Group	n=	%age
20 – 25	08	17.39
26 – 30	14	30.43
31 – 35	21	45.65
36 – 40	03	06.52
40 and above	0	0

Table II Parity of women for Labour Induction

Parity	n=	%age
Primigravida	29	63.04
G <sub>2</sub>	08	17.39
G <sub>3</sub>	06	13.04
G <sub>4</sub>	02	04.34
G <sub>5</sub>	01	02.17
G <sub>6</sub> & Above	0	00.00

Indications for the labour induction are shown in figure I. Prolonged pregnancy was most frequently seen reason for induction. (50%). This is our unit policy to induce a labour at 41+3 days gestation provided there is no contraindication to vaginal birth. Other indications for labour induction were Pregnancy induced hypertension PIH, mild to moderate pre-eclampsia, diabetes with developing macrosomia, reduced fetal movement, reduced liquor and other signs of placental insufficiency.

Twenty three women were allocated to the misoprostol group and 23 to the prostaglandin E<sub>2</sub> group. Misoprostol was more effective than PGE<sub>2</sub> in producing cervical changes. Delivery within 6-8 hours, after the first administration occurred more often in the misoprostol group, while in PGE<sub>2</sub> group the time was 11-12 hours [16 (69.56%) vs 2(8.69%)]. Induction to delivery time for other patients in both groups is shown in figure II.

Less patients in the misoprostol group required oxytocin augmentation than in the PGE<sub>2</sub> one [3(13.04%) vs. 5(21.73%)]. Repeat dose was required mainly in prostaglandin group [6(26.08%)] as compared with misoprostol [4(17.39%)]. Uterine tachysystole and hyperstimulation occurred more frequently in the misoprostol group [3 (13.04%)] than in the PGE<sub>2</sub> group [1 (4.34%)]. These are shown in figure III

The interval from induction to vaginal delivery was significantly shorter in the misoprostol group (6-8 hrs vs 11-12hrs). Abdominal delivery rate was more frequent in

misoprostol group because of fetal tachycardia and hyper-stimulation than prostaglandin group mainly due to failure to progress. [2 (8.69%) vs 1 (4.34%)]. These causes are shown in figure IV. No statistically significant differences were noted between the two groups including neonatal or maternal adverse outcome.

Figure I Indication for induction of labour

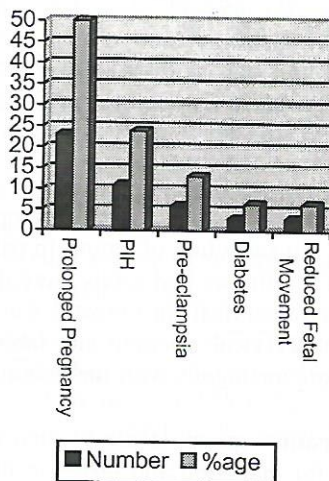


Figure II Induction delivery time in both groups

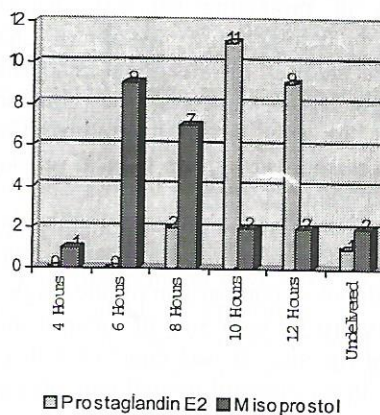


Figure III Oxytocin augmentation in both groups

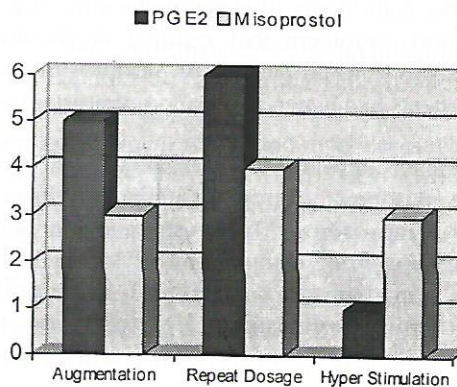
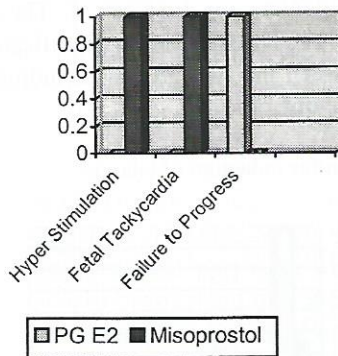


Figure IV Causes of Failure of Induction



### Discussion:

Intra-cervical Misoprostol was compared with prostaglandin E<sub>2</sub> for induction of labour in patients at term and post-term. The efficacy and safety were the main issue to be studied. Intra-cervical misoprostol was found to be more effective in cervical ripening and labour induction. These results were analogous with the results of the study by Rowland<sup>4</sup>.

The primiparous group of the women was the most common group for induction and obstetric intervention in our study; this is comparable with the Chan LY<sup>5</sup>.

Misoprostol was found more effective than prostaglandin E<sub>2</sub> in producing cervical changes with shorter induction to delivery time. Results of Chang YK were alike, in their study of intra-cervical misoprostol and prostaglandin E<sub>2</sub> for labour induction. They concluded that delivery within 12hrs after the first administration more often occurred in misoprostol group than in prostaglandin E<sub>2</sub> (85% vs 56%, P value <0.05)<sup>6</sup>.

Augmentation with oxytocin is frequently needed in prostaglandin's group mainly due to the inefficient uterine actions<sup>5</sup>. In a randomized comparison of one single dose of vaginal 50mg misoprostol with 3mg of dinoprostol in pre-induction cervical ripening, it was concluded that Bishop score was higher in misoprostol treated patients compared with dinoprostone treated patients but there was a higher frequency of hyper-stimulation syndrome in misoprostol group during the eight hours of cervical ripening. We had to face the similar problem that resulted in abdominal delivery in our two (8.69%) patients of misoprostol group. None of the patients had hyper-stimulation in prostaglandin group<sup>7</sup>.

More women developed hyper-stimulation during labour in the misoprostol group. Similar results were obtained while comparison of Misoprostol and Dinoprostol for cervical priming prior to induction of labour in term pregnancy in a randomized control trial in Australia<sup>4</sup>. Failure rates with Prostaglandin E<sub>2</sub> were less than

misoprostol, the mainly due to failure to progress consistent with the study of Chan LY<sup>5</sup>.

The postpartum complications were similar in both group with average blood loss that was inconsistent with the studies of Phillip H in their studies blood loss was more with Misoprostol Group<sup>8,9,10</sup>

### Conclusions:

Compared with prostaglandin E<sub>2</sub>, intra-cervical misoprostol is more effective in cervical ripening and labor induction at term. The higher frequency of uterine hyper-contraction associated with the use of misoprostol did not increase the risk of adverse intra-partum and neonatal outcomes, but the vigilant fetomaternal monitoring is considered to be essential in every case of induction. The cost of the drugs if compared there is a significant difference between both drugs. This is a very important factor in the country like Pakistan.

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