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A Randomised Comparative Study of Vaginal Misoprostol and Intracervical Cerviprime Gel for Induction of Labor

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ABSTRACT

Background: The onset of labor in human is a complex biological phenomena controlled by multiple regulatory mechanism. Although, most pregnant women experience spontaneous onset of labor, sometimes there is a need for labor induction in the favor of mother or baby and sometimes both. In recent times, prostaglandins analogue is the most widely used agents for induction of labor. This study is done to compare the efficacy and safety of misoprostol and cerviprime gel for induction of labor. **Methods:** Total 100 patients were enrolled in this group and randomly divided in equal numbers into two groups. 1st group received misoprostol 25mcg vaginal 6 hrly for 5 maximum doses and 2nd group received intracervical 0.5mg cerviprime gel from a 2.5ml of syringe. The results were analysed on the basis of the maternal and foetal outcome. The measures used to compare were, time intervals from induction to delivery, need for oxytocin, mode of delivery, maternal and foetal side effects. **Results:** The present study shows that the time intervals from induction to delivery was significantly shorter and the requirement of oxytocin was lesser for the augmentation of labour in the misoprostol group than the cerviprime gel group. **Conclusion:** Intravaginal misoprostol is an effective agent for induction of labour than cerviprime gel. The drug is easy to use, effective and safe to mother and the foetus.

Keywords: Induction of labor, Misoprostol, Cerviprime gel, Randomised Comparative Study.

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INTRODUCTION

Induction of labour is defined as the process of artificially stimulating the uterus to start labour.[1] It is observed in 5-25% of cases that the pregnancy outcome for mother and baby was better if baby is delivered.[2] In recent times, there is a rise in the incidence of labour induction for shortening the duration of pregnancy. Data suggests that the developed world has a high proportion (one in four) of infants delivered at term following induction.[3,4,5] The World Health Organization and ACOG both suggest prostaglandin analogue, low dose misoprostol as potent agents for medical induction of labor. The extracellular ground substance of the cervix is altered by prostaglandins, it results in the ripening of the cervix and also increase the activity of collagenase in the cervix. Prostaglandins also cause increase in intracellular calcium levels, resulting in contraction of myometrial muscle.[6,7] Currently, the two prostaglandin analogs available for cervical ripening are PGE1 (Misoprostol) and PGE2 (Cerviprime gel). In developing countries, incidence of Induction of labor is still low than developed countries.

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The reason of this lower incidence is the fear of failed induction resulting is LSCS, complications and adverse effects during the course of induction and cost efficacy of potent agents. So, This study was conducted to compare the efficacy and safety of intravaginal 25 microgram misoprostol with that of cerviprime gel containing 0.5 mg PGE2 for induction of labor in a tertiary care centre of rural Bihar

Aims and Objectives

This study was designed with aim to compare the effectiveness of two widely used pharmacological agents, Misoprostol and Cerviprime gel, for induction of labor.

Objectives were to compare the effectiveness, procedure handling ease, indications leading to assisted delivery or cesarean sections, cost efficacy and fetomaternal outcomes of both the given agents.

MATERIALS & METHODS

It is a randomized comparative study done over the time period of one year, from March 2015 to March 2016 in the department of Obstetrics and Gynaecology, Katihar Medical College and Hospital, Bihar, India. Total 100 patients, admitted from the OPD and emergency for induction of labor*, with different indications, were enrolled in this study after proper counseling and consent.

*Induction of labor is defined as the process of artificially stimulating uterus to start labor.

Inclusion Criteria

- Pregnancy with 28 weeks of gestation (period of viability)
- Single live foetus
- Cephalic presentation
- Bishop score more than 6
- Pregnancy with gestational hypertension
- Late-term pregnancy (period of gestation of 41 weeks)
- Pregnancy with preterm rupture of membranes
- Pregnancy with Rh-incompatibility

Exclusion Criteria

- Pregnancy less than 28 weeks of gestation
- Pregnancy more than 42 completed weeks of gestation
- Cephalo-Pelvic disproportion
- Malpresentation
- Medical contraindication to induction of labor
- Abruptio placentae
- Any previous utrine scar
- Grand multipara
- Pregnancy after infertility treatment

Two groups each with 50 randomly allotted patients were formed, randomization was maintained with sealed envelopes and assigned to patients after proper information and consent. A pre-designed performa was filled, all relevant lab investigations were collected and a repeat abdominal and pelvic examination was done to confirm the findings and rule out any contraindications, then induction was started.

Group – A, was administered misoprostol 25mcg 6 hourly vaginally for maximum 5 doses or till adequate contractions achieved*.

Group-B, was given cerviprime gel 0.5mg intracervical just below internal os 6 hourly for 3 maximum doses, for induction of labor.

Patients were monitored during labor according to standard labor room guidelines. *Adequate contractions were defined as 3 per 10 minute each lasting for 45 seconds. Tachysystole, hypertonus and hyperstimulation were noted and taken care of.

Any specific conditions like antihypertensive drugs and antibiotics were administered according to standard protocols.

Mother was monitored for her time of onset of labor, time of rupture of membrane, induction-delivery interval, need for oxytocin aumentation and mode of delivery etc. Any complications or adverse findings were also reported. Side effects of drugs used and puerperium events were also noted.

Newborns were monitored for their Apgar score and any specific complications.

RESULTS

In our study, total 100 patients were enrolled and divided into two groups with equal number of patients. The first group (Group-A) consists 50 pregnant patients, who were admitted for induction of labor fulfilling our criteria for inclusion and exclusion and received 25 mcg misoprostol vaginally 6 hrly for 5 maximum doses. The second group (Group-B) comprises another 50 pregnant women who need induction of labor and they were induced with 0.5 gm of cerviprime gel intracervical from a 2.5 ml syringe, every 6 hrly for maximum of 3 doses.

They were compared for their demographic variables and there was not any statistical difference seen. All the patient admitted, were mostly between the age group of 20-35 years. Maximum induction was done in the age group of 20-25 years. Nulliparous (54%) women needed more induction than multipara (46%). Gestational hypertension (39%) being the most common indication for induction of labor in our study and the second most common indication was post-dated pregnancy (31%). Other than these two preterm rupture of membranes, chorioamnionitis, IUGR were the common indication. Rh-isoimmunization was the rarest indication in our study.

The first outcome measure was induction to initiation of delivery. Labor cannot be initiated within two hours in any of the groups. In Group I, majority of patients (90%) had gone into labour within six hours, whereas in Group II, 52% had gone into labour within 6 hours. The difference of time taken in the two groups was statistically significant ($p<0.001$), this is shown in [Table 1].

Table 1: Showing time taken from induction of labor to initiation of labor.

Induction to Initiation of Labor	Group-1 (n-50) Number (%)	Group-2 (n-50) Number (%)	Total Number (%)
<6 Hours	45 (90%)	26 (52%)	71 (71%)
>6 Hours	5 (10%)	24 (48%)	29 (29%)
Total	50	50	100

The second major indication of outcome was induction to delivery interval and in our study 11.23 hours was the mean induction to delivery interval in group-1 and in group-2 it was 18.5 hours. In Group -1, 40% of patients delivered within 12 hours, while 44% patients delivered within 12-24 hours. In Group-2, 16% of patients delivered within 12 hours, whereas 44% patients delivered within 12-24 hours. In comparison to Group -1, where no patient delivered after 24 hours, 14% of patients delivered vaginally after 24 hours in Group-2. The difference of induction-delivery interval was statistically significant ($p=0.02$).

Out of 50 patients, 84% patients had vaginal delivery and 16% had cesarean section in group-1. In Group-2, vaginal delivery was seen in 74% and LSCS rate was 26%. The difference in mode of delivery in two groups was statistically not significant [Table 2].

Table 2: Showing Mode of Delivery in both groups.

Mode of Delivery	Group-1 (n-50) Number (%)	Group-2 (n-50) Number (%)	Total Number (%)
Vaginal	42 (84%)	37 (74%)	79 (79%)
LSCS	8 (16%)	13 (26%)	21 (21%)
Total	50 (100%)	50 (100%)	100

In group-1, all patients reached active phase of labor without oxytocin, while in group-2, 62% patients required oxytocin to reach active phase of labor. This difference was found statistically significant ($p<0.001$).

Indications for caesarean section in Group I was non-progress of labour in 3 patients (37.5%), foetal distress 3 patients (37.5%) and abnormal uterine action in 2 (25%). In Group-2, non-progress of labour was present in 6 (46.1%), foetal distress in 3 (33%), and abnormal uterine action in 4 patients (30.7%).

In Group -1 and Group -2, 10% and 8% respectively babies had Apgar score <7 at 1 minute and 2% and 4% had Apgar scre <7 at 5 minutes. This was not found statistically significant.

Table 3: Showing indications of cesarean sections in both groups.

Indication for cesarean section	Group-1 (n-50) Number (%)	Group-2 (n-50) Number (%)
NPOL	3 (37.5%)	6 (46.1%)
FD	3 (37.5%)	3 (33%)
Abnormal uterine contraction	2 (25%)	4 (30.7%)
Total	8	13

Table 4: Showing Apgar score less than 7 at 1 minute and 5 minute.

Apgar Score	Group-1 (n-50) Number (%)	Group-2 (n-50) Number (%)
<7 at 1 minute	5 (10%)	4 (8%)
<7 at 5 minute	1 (2%)	2 (4%)
Total	6	6

In both groups, 2 patients in each suffered from PPH, but they were managed with the help of pharmacological agents and blood transfusion. No Maternal death was reported in our study. Patients in group-1 experience fever and nausea.

DISCUSSION

The demographic data of our study population including maternal age, gravidity and gestational age were comparable with similar studies.[8-10] In the present study, maximum number of patients requiring induction was in the age group of 21-25 years (60%) which is comparable to that reported by Shivarudraiah and Palaksha.[11]

In our patients, maximum number of patients was induced for gestational hypertension (39%), followed by postdatism (31%), these two were the commonest indication reported by Shivarudraiah and Palaksha.[11]

90% patients in Group-1 went into labour after induction within 6 hours as compared to 52% in Group-2, the difference being statistically significant ($p<0.001$). This shows that misoprostol has shorter induction to onset of labour interval as compared to Cerviprime. These results are quiet consistent with the study conducted by Kudagi et al. Buser et al. Nunes et al. Belfrage et al, Neiger and Greaves and Rozenberg et al.[12-17]

The mean induction-delivery interval was 11.23 hours in Group-1 and 18.5 hours in Group-2. This is comparable with the results of Nanda et al.[18] who reported mean inductiondelivery interval of 13.3 hours in misoprostal group and 18.53 hours in dinoprostone group ($p=0.01$).

Gupta et al,[19] also reported that spontaneous vaginal deliveries were 86% in misoprostol group compared to 68% in dinoprostone gel, which is comparable to our study.

CONCLUSION

In our study, we found that the misoprostol is the better agent for induction of labor as compared to the cerviprime gel. Misoprostol has short induction to delivery interval than cerviprime gel , so, it resulted in short duration of labour. Misoprostol group had more vaginal deliveries than cerviprime gel group and the need of oxytocin augmentation was also less with the misoprostol . So, Misoprostol is found to reduce the Cesarean section rate and has advantage of short duration of labor in gestational hypertension. Although hyperstimulation and meconium stained liquor was more in misoprostol group in few patients bit it did not have any effect on the Apgar score of the neonates. Misoprostol also does not need cold chain storage and is cheaper and the ease of its administration is also remarkable in comparison with cerviprime gel. Thus misoprostol can be considered as safe, efficacious, cheap and mother and fetus friendly drug for the induction of labour especially in rural areas of developing countries where maintenance of cold chain and availability of clinical experts are difficult. But, again this need to evaluated in large clinical studies and with more precise design so person to person observation and participation errors can be minimize.

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