

Induction of Labour - A Comparison between Misoprostol and Dinoprostone

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ABSTRACT

Aims: To compare the duration of labour between misoprostol and dinoprostone, need for oxytocin augmentation, mode of delivery i.e. whether spontaneous vaginal delivery or forceps delivery or vacuum delivery, rate of c- section & fetal condition at birth in terms of 5 minutes of apgar score.

Study design: Comparative study

Setting: Department of Obstetrics and Gynaecology, Ghurki Trust Teaching Hospital, Lahore from 1st July 2009 to 30th June 2010.

Material & methods: This study was conducted on hundred patients undergoing induction, in the labour ward of Ghurki Trust Teaching Hospital. The patients included were between 37 to 42 weeks of gestation with favourable cervixes i.e. Bishop score less than 6. These patients were divided into two groups randomly, each group consisted of fifty patients. Patients in group A were induced with dinoprostone i.e. prostaglandin E₂ vaginal pessary while patients in group B were induced with misoprostol i.e. prostaglandin E₁, given vaginally

Conclusion: Proper selection and monitoring of patients induced with misoprostol can prevent untoward maternal and fetal events.

Key words: Misoprostol, dinoprostone, induction of labour

INTRODUCTION

Induction of labour is the artificial initiation of uterine contractions prior to their spontaneous onset leading to progressive dilatation and effacement of the cervix and delivery of the baby. When induction is indicated cervical ripening is the most important part of the process of labour induction and the most important predictor of success. Ripening of the cervix greatly facilitates labour and increases the likelihood of vaginal delivery¹⁻³. If the cervix is unfavourable and induction is necessary then ripening with prostaglandins is required.

In the past twenty years prostaglandins have been used in a variety of formulations to ripen the cervix and to induce labour. Prostaglandins were first used intravenously in late 1960s, but this route of administration was associated with significant side effects⁴.

A change in the route of administration from systemic to local has resulted in fewer side effects and it has also been found that smaller doses have a marked softening effect on the cervix.⁵ Prostaglandins may be given via the oral, intravaginal, intracervical and intravenous routes all of which are effective. Intravaginal administration of exogenous prostaglandin E₂ i.e., dinoprostone is the

most widely used pharmacological method to promote cervical ripening and labour induction^{6,7}. Another prostaglandin used for the purpose of labour induction is prostaglandin E₁ i.e. misoprostol. It is much cheaper, and more easily stored than other landins⁸. Several trials have shown it to be efficacious.

Although a number of studies have been conducted abroad, comparing the effects of PGE₁ and PGE₂ on induction of labour at term but no such study has been done here. The main aim of our study will be to find out the effect of prostaglandin E₁ on induction of labour and to compare the results with those of prostaglandin E₂.

MATERIALS AND METHODS

This comparative study was conducted in the Department of Obstetrics and Gynaecology, Ghurki Trust Teaching Hospital, Lahore from 1st July 2009 to 30th June 2010 on one hundred patients undergoing induction, in the labour ward. The patients included were between 37 to 42 weeks of gestation with favourable cervixes i.e. Bishop score less than 6. These patients were divided into two groups randomly; each group consisted of fifty patients. Patients in group A were induced with dinoprostone i.e. prostaglandin E₂ vaginal pessary while patients in group B were induced with misoprostol i.e. prostaglandin E₁, given vaginally. All those patients at term i.e. between 37 to 42 weeks with singleton

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pregnancy, Bishop score less than 6 and vertex presentation were included in the study. Patient with grand multiparas, malpresentations, multiple pregnancy and previous C-section were excluded from the study.

RESULTS

A total of hundred patients between 37 to 42 week of gestation were included in the study that was divided in two equal groups of 50 each. Group A consisted of patients who were induced with dinoprostone (PGE₂) and group B consisted of patients who were induced with misoprostol PGE₁. The patients included in the study were of 18 to 37 years of age. The highest number of patients in Group A was between 20-25 years i.e. 48% whereas in group B they were between 26-30 years (44%). Three patients (6%) in group A and one patient in group B (2%) was below 20 years of age. Only one patient (2%) in group A was above 35 years of age.

All the patients in the study were between 37-42 weeks. Greatest number of patients was at 39 and 40 weeks in both the groups. 15(30%) in group A and 12 (24%) in group B. The mean gestational age in the two groups was the same i.e. 39.1 weeks.

Table 3 shows a comparison between the parity in both the groups. Highest number of patients who were induced in both groups were primigravidae i.e. 18 (36%) in group A and 19 (38%) in group B. 2nd gravidae were 18(36%) and 15(30%) in group A and group B respectively while 3rd gravidae were 12(24%) in each group. 4th gravidae were 2(4%) in group A and 4(8%) in group B.

Table 1: Augmentation with Oxytocin (n=100)

| | Group A | PGE ₁ (Group B) |
|--------------|---------|----------------------------|
| Required | 30(60%) | 14(28%) |
| Not required | 20(40%) | 36(72%) |

Table 2: Duration of Labour

| | PGE ₂ (Group A) | PGE ₁ (Group B) |
|-------|----------------------------|----------------------------|
| < 5 | - | 2(4%) |
| 5-7 | 9(18%) | 29(58%) |
| 7-9 | 9(18%) | 12(24%) |
| 9-11 | 20(40%) | 7(14%) |
| > 11 | 12(24%) | 0 |
| Total | 50(100%) | 50(100%) |
| Mean | 9 hrs | 7 hrs |
| SD | 1.98 | 1.75 |

P < 0.05 (P = 5.357)

Table 3: Mode of delivery

| Mode of delivery | PGE ₂ (Group A) | PGE ₁ (Group B) |
|------------------|----------------------------|----------------------------|
| SVD | 31(62) | 46(92%) |
| Instrumental | 13(26%) | 3(6%) |
| C-Section | 6(12%) | 1(2%) |

Table 4: Indications for caesarean section

| Indications | Group A | Group B |
|---------------------|-----------|---------|
| Failed Induction | 3(50%) | 0 |
| Failure to Progress | 2(33.33%) | 1(100%) |
| Fetal Distress | 1(16.66%) | 0 |

Table 5: Complications

| Indications | Group A | Group B |
|---------------------|------------|---------|
| Fetal distress | 8(53.33%) | 1(50%) |
| Failure to progress | 2 (13.33%) | 1(50%) |
| Failed induction | 3 (20%) | 0 |
| PPH | 2 (13.33%) | 0 |

Table 6: Apgar score at 5 minutes

| Apgar score | Group A | Group B |
|-------------|----------|---------|
| 10 | 18 (36%) | 27(54%) |
| 9 | 20 (40%) | 19(38%) |
| 8 | 8 (16%) | 4(8%) |
| 7 | 4(8%) | - |
| Mean | 9.30 | 9.48 |
| SD | 0.6 | 0.57 |

P Value – Not significant

DISCUSSION

Induction of labour is carried out in obstetric practice for a number of indications. Various agents have been used for this purpose in the past, but in last 20 years prostaglandins have gained extreme popularity due to their greater effectiveness. Prostaglandin E₂ i.e. dinoprostone and prostaglandin F₂ alpha i.e. dinoprostone are the most commonly used formulations, used for labour induction at term and pregnancy termination respectively.

Recently a new prostaglandin PGE₁ by the name of misoprostol has gained attention for use in obstetrics as a labour induction agent. A number of studies have been done abroad, evaluating its efficacy for first trimester termination, but few studies have assessed its action in case of labour induction in term pregnancy.

One such study was conducted in King George Hospital Ilford from January 1997 to June 1998⁹ the study demonstrated a significant decrease in induction to delivery interval when misoprostol was compared with dinoprostone and a significant reduction in the use of oxytocin augmentation. However the difference in the instrumental delivery rate and caesarean sections rate was non-significant. As far as Apgar scores were concerned there was no clinically important difference seen between the both groups. No cases of uterine hyper-stimulation / rupture were seen in this study. It was also seen that failed induction is very uncommon when misoprostol is used, while all practicing obstetrician will be familiar with the number of women who remained undelivered after several days of dinoprostone.

Our study was also carried out to find out the effectiveness of misoprostol for labour induction and

to detect any untoward fetal or maternal effects and results were compared with those of dinoprostone, the currently most widely used agent. In our study results were almost the same as in the above mentioned study. The mean duration of labour in patients induced with misoprostol was 7 ± 1.75 hours which was two hours less than the mean duration of labour recorded in patients induced with dinoprostone. Out of fifty patients induced with misoprostol only 14 patients required augmentation with oxytocin. While 30 patients needed oxytocic augmentation after induction with dinoprostone.

Rate of instrumental delivery was 26%, in patients with dinoprostone induction and only 6% of patients induced with misoprostol had instrumental delivery ($p < 0.05$). Caesarean section rate was 12% and 2% in patients induced with dinoprostone and misoprostol respectively ($p < 0.05$).

Apgar score at 5 minutes after birth were almost the same in both the groups. Although few other studies done by Danielian¹⁰ and Hofmeyr¹¹ have admitted the advantages of misoprostol but have recommended caution with its use, as there have been reports of uterine hyperstimulation, uterine rupture and fetal loss with and without previous caesarean section¹². The dangers are particularly great in low income countries where facilities for monitoring the mother and the fetus and emergency caesarean section are limited¹³.

Hofmeyr also reported that induction with misoprostol resulted in a more painful labour.¹⁴ No such untoward maternal or fetal effects were encountered by us. There were no cases of uterine hyperstimulation, rupture, fetal loss or fetal distress necessitating emergency caesarean section. Hence it is stressed that proper selection and monitoring of patients induced with misoprostol should prevent any adverse maternal or fetal outcome and maximize efficacy¹⁵.

Various studies have confirmed comparable results with other methods of cervical ripening and induction agents¹⁶. There is evidence that oral misoprostol has the potential to induce labour as safely and effectively as its vaginal analogue¹⁷.

In the light of all this and the fact that misoprostol is cheap, effective and does not require refrigeration, it has a powerful capacity to compete with standard induction agents like dinoprostone especially in countries where dinoprostone can not be afforded.

CONCLUSION

Proper selection and monitoring of patients induced with misoprostol can prevent untoward maternal and fetal events. We feel that the potential for the use of misoprostol can be more positively commented on,

particularly its use in third world, where standard induction agents cannot be afforded.

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