

ROLE OF PROSTAGLANDIN E2 GEL FOR INDUCTION OF LABOUR IN PREECLAMPTIC PATIENTS

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Abstract

This prospective study for induction of labour in pre-eclamptic patients was carried out in the department of Obstetrics and Gynaecology, BSMMU and DMCH, during October 2000 to February 2002. This study included 50 pre eclamptic women in whom induction of labour were done by prostaglandin E2 gel (case) and 50 pre eclamptic women in whom induction of labour were done with oxytocin infusion (control).

Comparison of induction delivery interval in case and control was 11.58 ± 3.66 versus 14.83 ± 1.58 hours in multiparous. In primiparous 14.28 ± 2.59 versus 14.85 ± 1.33 . Statistically the difference between case and control was not significant in primiparous. But significant in multiparous ($P < 0.01$).

Mode of delivery in cases was more by vaginal delivery 36 (72%) but less in control 18 (36%). Mode of delivery in case by LSCS was less 14 (28%) in cases than control 32 (64%).

The difference between mode of delivery among induction of labour with prostaglandin gel in pre eclamptic patients and induction of labour with oxytocin was statistically highly significant ($P < 0.001$).

Key words: prostaglandin E2 gel; induction of labour; pre-eclampsia

Introduction

Eclampsia and pre-eclampsia are two major causes of morbidity and mortality during pregnancy, childbirth and puerperium. Of the estimated maternal deaths is 5, 00,000 every year world wide. The rate of which is 5.5 / 1000 live birth in our country (Rahman and Khan, 1997)¹. Of the total maternal deaths, 50-60% is due to eclampsia (Shamsuddin et al, 1996)². Our main aim is to

prevent convulsion and complications of pre eclampsia patients and thereby reducing the morbidity by termination of pregnancy. Terminations were done by induction of labour hoping for a vaginal delivery.

In Bangladesh, the incidence of eclampsia is still very high, about 5 percent of total deliveries and remains most common causes of maternal and perinatal death (Khatoun, 1992)³.

In the 1970s, the era of prostaglandin in obstetrics began. Recently Keirse and Van Oppen (1989)⁴ have summarized the available literature that consecutive application of prostaglandin compared to oxytocin infusion causes increased rate of successful induction of labour and reduced the incidence of surgical termination of pregnancy, (caesarian section and instrumental vaginal delivery) and also shortened duration of labor.

A similar conclusion was drawn by Rayburn (1989)⁵, who summarized the experience of trials in which intra-cervical or intra-vaginal PGE2 gel was used for cervical ripening before induction of labour.

Dinoprostone was used for pre-induction cervical ripening and dilatation in pregnant women at or near term with unfavorable cervix, like poor Bishop's score. Dinoprostone (0.5 mg) applied locally, intra-cervically can provide significant improvement in the Bishop's score. Cervical ripening prior to induction of labour could significantly facilitate the labour onset and progression of labour and increase the chance of vaginal delivery, particularly in primigravida patient.

Several different formulations of PGE2 had been used by the vaginal route for ripening the unfavourable cervix at term (Shephard et al., 1976; Calder et al., 1977; Thierry et al., 1977; Prasad et al., 1984)⁶.

Materials and methods

This prospective study was carried out in the department of Obstetrics and Gynaecology, Bangabandhu Sheikh Mujib Medical University (BSMMU) and Dhaka Medical College Hospital (DMCH), during the period from October 2000 to February 2002.

A total number of 100 pregnant women with pre eclampsia (> 36 weeks gestation), irrespective of age, both primi and multigravida (up to 4th gravida),

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among the patients attending the department of obstetrics and gynaecology, BSMMU and DMCH were included. Postmaturity, CPD, malpresentation, multigravida (>4), severe preeclampsia, diastolic blood pressure (>110) mmHg were excluded from the study.

Study subjects were equally divided in two groups.

Fifty subjects with pre eclampsia in whom labour were initiated with prostaglandin taken as study cases. 2nd group fifty subjects with pre eclampsia in whom labour were initiated with oxytocin taken as control.

Study population

The following variables were measured for each study subject with clinical history; physical examination including blood pressure, oedema, urinary albumin was done also per abdominal and per vaginal examination (pelvic adequacy and cervical scoring) were performed.

Total 100 patients were collected by randomized sample collection. All the patients' gestational age were between 36 weeks to 40 weeks and Bishop's score less than 4 and diastolic blood pressure not more than 110. Fifty patients with pre eclampsia were taken as cases and given induction of labour with 0.5 mg prostaglandin E2 gel and 50 patients with pre eclampsia were taken as a control and given induction of labour with oxytocin. Then modes of delivery of all the patients were noted.

Number of vaginal delivery or caesarean section of both cases and control were recorded. And at the same time maternal complication along with Apgar score of the fetus were recorded.

All the necessary information and clinical data collected for each of the study patients were systematically recorded in a predesigned questionnaire.

Data were compiled and appropriate statistical analyses were done using computer based software. A P value <0.05 was taken as minimum level of significance.

Observations and results

This study included 100 pre eclamptic pregnant women. Among 50 pre eclamptics were given induction of labour with prostaglandin E2 gel selected as case and 50 pre eclamptics were given induction of labour with oxytocin infusion and selected as control. In this study, there was no major complication and no death.

Basic data of study subjects shows the mean (\pm SD) age of the case and control subjects were 27.04 ± 5.23

versus 26.44 ± 4.49 years. Parity 0.76 ± 1.00 versus 0.8 ± 1.01 , gravida 1.88 ± 1.55 and versus 1.90 ± 1.09 , gestational age 38.02 ± 1.33 versus 37.42 ± 1.28 weeks. Systolic blood pressure 141.90 ± 6.05 versus 144.70 ± 6.01 mm of Hg, Diastolic blood pressure 98.10 ± 6.30 versus 101.30 ± 5.79 mm of Hg. So, no significant difference was observed in distribution of parity and gravida between case and control groups.

Clinical presentation of case and controls showed oedema 31 (62%) versus 19 (38%), oedema + 31 (62%) versus 40 (80%) and oedema ++ 19 (38%) versus 10 (20%), urinary albumin + 22 (44%) versus 35 (70%), urinary albumin ++ 27 (54%) versus 15 (30%), urinary albumin +++ 1 (2%) versus nil respectively. Bishop's score in case and control 3.86 ± 0.76 versus 3.64 ± 0.48 respectively. However, mean (\pm SD) differences of other parameters like oedema and urinary albumin between case and control showed statistically significant difference ($P > 0.05$ and $P < 0.001$, respectively). Preinduction Bishop's score showed no significant difference between case and control in primiparous (mean \pm SD: 3.78 ± 0.85 vs 3.77 ± 0.43); but in multiparous the difference was significant ($P < 0.01$, mean \pm SD: 3.96 ± 0.64 vs 3.50 ± 0.51).

The mean (\pm SD) induction-delivery interval between case and control subjects of primiparous and multiparous groups were in primiparous 14.28 ± 2.59 vs 14.85 ± 1.33 hours and in multiparous 11.58 ± 3.66 vs 14.81 ± 1.85 hours. Statistically the difference between case and control was not significant in primiparous, but significant in multiparous ($P < 0.01$) group.

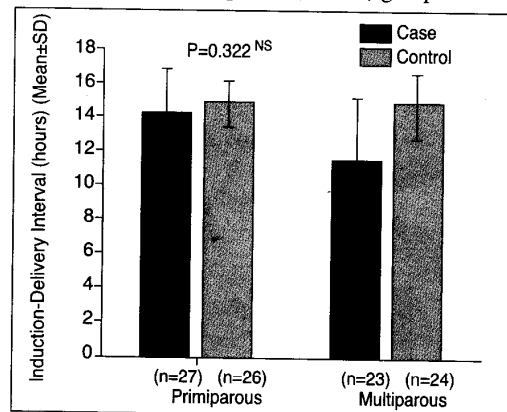


Fig 1: Comparison of induction delivery interval between case and control subjects in primiparous and multiparous groups

Out of 50 cases vaginal delivery were 36 (72%) and Lower Segment Caesarean Section (LSCS) were 14 (28%).

Out of 50 control, normal vaginal delivery were 18 (36%) and LSCS were 32 (64%). There were more vaginal delivery in case group and more caesarean section in control group. On the other hand, less caesarean section in cases and less normal vaginal delivery in control group.

Proportion test (Z-test) showed highly significant difference (P<0.001) between two groups. Vaginal delivery was higher in cases and LSCS was higher in control subjects.

Table I: Comparison of mode of delivery of case and control subjects after induction of abl

Parameters	Case (n=50)	Control (n=50)	P value
Normal Vaginal delivery (NVD)	36 (72%)	18 (36%)	<0.001***
Caesarean Section (LSCS)	14 (28%)	32 (64%)	

(P < 0.001***) Highly Significant

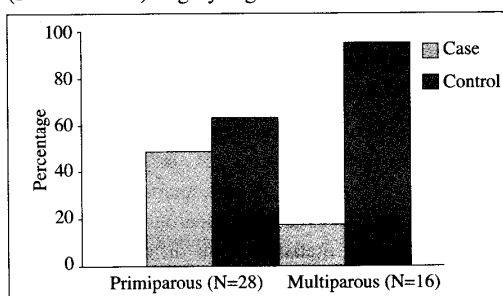


Fig 2 : Comparison of LSCS delivery between case and control subjects in primiparous and multiparous groups

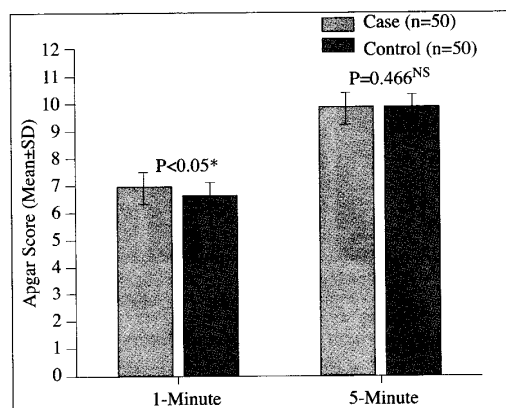


Fig 3: Comparison of 1-minute and 5-minute Apgar score between case and control subjects

Apgar score at 1-minute in case and control subjects were 6.92 ± 0.60 and 6.64 ± 0.48 respectively, which showed statistically significant difference (p<0.05). However, 5-minute Apgar score 9.80 ± 0.61 and 9.88 ± 0.48 of case and control, respectively, showed no significant difference.

Table II : Indications for LSCS in case and control subjects

Parameters	Case (n = 50)	Control (n = 50)	P value
Fetal Distress	3(21.4%)	3(9.4%)	'Z'-test (no significant difference)
Failed Induction	5(35.7%)	15(46.9%)	
Cervical Dystocia	3(21.4%)	2(6.3%)	
Prolonged Labour	3 (21.4%)	12(37.5%)	

LSCS were done in total 46 patients (14 case, 32 control). Among them, fetal distress was 3 (21.4%) in case and 3 (9.4%) in control. Failed induction was 5 (35.7%) in case and 15 (46.9%) in control. Cervical dystocia was 3 (21.4%) in case and 2 (6.3%) in control. Prolonged labour was 3 (21.4%) in case and 12 (37.5%) in control. Proportion test (Z-test) showed no significant difference.

Discussion

Pre-eclampsia and eclampsia are one of the common cause of maternal mortality and morbidity and prenatal loss. Khatoon (1992)³ showed that in Bangladesh the incidence of eclampsia is still very high (about 5% of total deliveries) and remains most common cause of maternal and perinatal mortality. Calder et al. (1977)⁷ showed the use of prostaglandin to ripen the cervix prior to induction of labour into extraamniotic space. The incidence of failed induction is reduced.

Theiry et al. (1984)⁸ administered prostaglandin E2 vaginal gel in unfavorable cervix and showed improvement in the Bishop's score of the patients 12 hours after treatment.

The present study was carried out on 100 women with more than 36 weeks of pregnancy and equally divided into case (prostaglandin induced patients) and control (oxytocin induced patients). Mode of delivery between case and control groups was statistically highly significant. In case (induction of labour with prostaglandin) showed 36 (72%) normal vaginal delivery and 14 (28%) LSCS versus 18 (36%) normal vaginal delivery and 32 (64%) LSCS in control (induction of labour with oxytocin). It was also found that shorter the duration of labour in case

group 11.58 ± 3.66 hours) than control group (14.83 ± 1.58). It can be assumed from this study that rate of caesarean section is reduced in pre eclampsia patients when induction of labour were done by PG E2 gel in comparison to induction done by oxytoci infusion.

Conclusion

It may be concluded from this study reduction of caesarean section rate in preeclampsia can be achieved by induction of labour with prostaglandin. Termination of pregnancy is one of the integral part of the antenatal management in preeclamptic patients. Termination of pregnancy there by critically reduces chances of convulsion in these patients. Antenatal visits for the preeclamptic patients should be early and regular. By regular antenatal check-up control of blood pressure and timely termination of pregnancy can greatly reduce the chance of development of eclampsia. Induction of labour by prostaglandin can be effectively done and usual mode of delivery is vaginal delivery and there by reducing the morbidity of caesarean section. Further large-scale study can be carried out to arrive at a definite conclusion

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