Induction of Labour Single Vaginal PGE 2 Vs Early Amniotomy and I/V Oxytocin

S MUNAWAR F ZAFAR A SHAUKAT *A ASIFA A KARIM,*
Nishtar Hospital, Multan & Sir Ganga Ram Hospital, Lahore.
Correspondence to Dr. Farid Zafar, Associate Professor Gynaecology, e-mail:- alfareedzafar@hotmail.com.

Objective: To compare two methods of induction of labour. Amniotomy with intravenous oxytocin infusion versus single use of prostaglandin E2 vaginal tablet. **Design** Perspective randomized clinical trial . **Setting**: The department of Gynae & Obs Nishtar Hospital Multan & Ganga Ram hospital lahore.100 patients were recruited .50 were randomized for amniotomy followed by oxytocin infusion. Second group underwent labour induction with PGE2 which was repeated after 6 hours, if no change in bishop score is observed. **Period**: 17 .2 .2004 to 17 .2.2005 **Results**: In the study the results regarding mean Bishop score change, duration of labour and apgar score at 5 minutes were comparable in both groups. In the group 2 mean induction to delivery time was 9 hours.(6-12 hrs).The mean cervical change score was 8.5.Duration of labour in group 2 was in the mean of 7hrs.In group 1 mean cervical change was 7.5(range5-7),induction to delivery time was 10.5 hrs. The duration of labour was 7.5 hrs. Analgesic requirements varied in both groups. No patient with PGE2 required pain relief before membrane rupture. In the oxytocin group narcotic analgesia was given from the start of uterine contractions. **Conclusion**: PGE2 vaginal tablet for induction of labour in case of unfavourable cervix is superior to use of amniotomy and oxytocin. It was found to be safe and effective with minimum of patient interference.
Key words: Induction, early amniotomy, PGE2

History of intervention dates back to sixteenth century, when tents were used to dilate the cervix mechanically. In 1756 amniotomy was done for the first time for induction by Thomas Denmani of Middlesex. In 1968 first trial was conducted for the use of prostaglandins for induction of labour. In 1970 role of PGE2 was demonstrated (Sultan M. M. Karim).In the late 60's and early70's O'Driscoll et al ,after extensive study, included the use of amniotomy and oxytocin as part of active management of labour (O'Driscoll:1973).

Material and methods: The study was conducted at Nishtar hospital Multan and Ganga Ram hospital Lahore from 17.2004 to 17.2.2005.100 patients were recruited through out patient and emergency. Atotal of 100 patients were studied.

Inclusion criteria :

- 37-42 weeks gestation
- Single foetus with cephalic presentation
- Parity <4
- Bishop score >4

Exclusion criteria:

- Contraindication to vaginal delivery like CPD.
- Scarred uterus
- Patients who have undergone trial of induction in last 24 hors.

Placenta previa: Detailed history and examination was done. Modified Bishop scoring was done. Ultrasound evaluation for fetal status and confirmation of dates. Routine investigations were done. The method of induction depended on Bishop Score and individual patient condition. Patients randomly allocated to two groups. In group 1 amnitomy followed by oxytocin and in group 2 single PGE2 was placed in the posterior fornix. Vaginal examination repeated at 3 hourly interval. Tablet can be repeated at 6hourly interval, maximum dose given is 3 tablets. Patients in group 2 had an amniotomy after 6hrs or sooner if there was regular uterine activity and cervical dilatation had reached 5cm Oxytocin is usually given after amniotomy, dose is 10 units of oxytocin in 1000 ml of dextrose water 5%.Starting dose is 1Mu/min.Intensity of contractions is measured after every 30 minutes. Analgesia given as required. Partogram was drawn. Continuous CTG was done. Meconium staining is taken as a soft indicatorof fetal distress. At birth neonatal score is assessed by apgar score

Results:

Characteristics of patients undergoing induction

Variables	Group 1 Amniotomy & I/V Oxytocin (n=50)		Group 2 PGE2 vaginal tablet (n=50)	
	Mean	Range	Mean	Range
Maternal age	27	19-35	24.5	17-32
Parity	2.5	1-4	2	1-3
No. of primpipara	8		18	
Initial bishop score	5.5	4-7	5	4-6

Indications of induction

Indications	Group 1 Amniotomy & I/V Oxytocin (n=50)		Group 2 PGE2 vaginal tablet (n=50)	
	Mean	Range	Mean	Range
Hypertension	20	40%	28	56%
Prolonged pregnancy	06	12%	08	16%
Poor fetal growth	06	12%	02	8%
Congenital fetal anomaly	04	8%	02	4%
IUFD	02	4%	02	4%
PROM	12	24%	02	4%
Diabetes mellitus	-	-	04	8%

Mode of delivery

Mode of delivery	Group 1 Amniotomy & I/V Oxytocin (n=50)		Group 2 PGE2 vaginal tablet (n=50)	
	Mean	Range	Mean	Range
Spontaneous vaginal delivery	36	72%	40	80%
Vacuum extraction	-	-	02	4%
Forceps delivery	04	8%	02	4%
Casearean delivery	10	20%	06	12%

Indications for C-section

Indications	Group 1 Amniotomy & I/V Oxytocin (n=50)		Group 2 PGE2 vaginal tablet (n=50)	
	Mean	Range	Mean	Range
Fetal distress	-	-	02	4%
Failure to progress	02	4%	02	4%
Uterine hyperstimulation	04	8%	-	-
Failure of induction	02	4%	-	-
Local tissue reaction	-	-	02	4%
Imminent eclampsia	02	4%	-	-

Fetal outcome

Variables	Group 1 Amniotomy & I/V Oxytocin		Group 2 PGE2 vaginal tablet	
	Mean	Range	Mean	Range
Agrar score at 5 min	08	6-10	8,5	7-10
Birth weight	2.71	2.31-3.60	2.7	2.31-3.48
Neonatal jaundice	02	4%		

Discussion:

In the previous two decades prostaglandins have established their role in the induction of labour, especially in cases where there is unripe cervix. There have been fewer studies conducting a randomized comparison between available local prostaglandin preparation and oxytocin infusion (Harman-JM Jr; 1999). The advent of prostaglandins opened a promising avenue in the field of induction of labour and medical abortions (Egarter-C; 1989) (Reilly-K.E.H;1994), (Warenskj-JC; 1997). A study conducted on 200 patients concluded that prostaglandin E2 intravaginal preparation is superior to low dose oxytocin (Pollnow-DM1996)

The rate of C-section is higher with oxytocin for failed induction (Ashrafunnessa; 1997)

In this study hypertension or preeclampsia turned out to be the foremost cause of induction of labour followed by PROM and prolonged pregnancy (14%).Increased incidence of neonatal jaundice in the oxytocin induced labour was seen compared with that in PGE2 group but this did not reach statistical significance (Bartnicki-J;1995) (Hodnett E D; 1997), (Leylek 1998).56% of the patients with PGE2 expressed their satisfaction because of their free mobility and lack of infusion. More patients with oxytocin and amniotomy were unhappy.

All patients induced for poor fetal profile delivered an alive baby. The effects of both induction methods regarding other outcome variables were comparable (Almstrong-H;1991) (Bartnicki-J;1995).

Mode of delivery is determined by maternal condition and fetal ability to withstand the stress of labour. Vaginal delivery is preferred to avoid the additional stress of surgery.

The safety of PGE2 makes it a safe drug in high risk pregnancies (Egarter-C;1989).PGE2 may be a vasodilator and decline was observed in diastolic and systolic blood pressures(Rayburn-W;1997).A study evaluating role of oxytocin & amniotomy reported an increased incidence of operative deliveries.

Oxytocin 2-5 Mu/min. I/V is an antidiuretic in 10-15 minutes, if given with large volumes of fluids like dextrose water 5%, it can cause hyponatremia and convulsions. It causes peripheral vasodilatation and reflex tachycardia thus increasing the work load on the heart which is undesireable where cardiac status is compromised.

Two IUD patients were induced, the one with abruption was given oxytocin because the cervical score was favourable. The second one with unknown cause was induced with PGE2, the dose was repeated after 6 hrs, labour was established and baby was delivered In a study conducted to assess the effect of PGE2 as an inducing agent in patients with fetal demise, it was concluded that PGE2 is more effective agent (Lundrup-J; 1996).

Three patients with congenital abnormalities, two were induced with oxytocin and one having polyhydramnios was delivered with PGE2. All labours were uneventful.

One patient with PGE2 was delivered by vulvar edema. This was an adverse effect secondary to PGE2.

Two patients with diabetes had to be induced with PGE2, later on deliveries were conducted with vacuum extractor and in one oxytocin had to be used in later stages of labour. Hod-M and colleagues studied the outcome of diabetic pregnancies regarding incidence of macrosomia, shoulder dystocia and cesarean delivery rates. These were found to closer to the normal population in cases where elective delivery was planned with strict glycemic control. (Hod-M 1998) .The ideal ripening agent should be non invasive, rapidly effective and safe for the mother and the fetus, it should promote ripening with out provoking uterine contractions. Oxytocin is a poor ripening agent because there are very few oxytocin receptors in the cervix compared to myometrium.

The two most important advantages of prostaglandins are simple application and physiological advantages. In a clinical trial it was discovered that PGE2 reduced the active phase of labour (Bozhinova-S 1995)

Mercer et al concluded that amniotomy should be performed late in labour to reduce the incidence of chorioamnionitis and significant cord compression (Mercer B.M 1995)

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