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COMPARISION BETWEEN INTRAVAGINAL MISOPROSTOL AND PROSTAGLANDIN E2 FOR LABOUR INDUCTION

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ABSTRACT

OBJECTIVE: *To evaluate the use of misoprostol compared with PGE2 for labour induction at term in terms of cesarean delivery, induction delivery interval, hyperstimulation and neonatal outcome.*
STUDY DESIGN: *Comparative descriptive study*
SETTING: *Department of obstetric and Gynecology unit-I labour ward of Liaquat University Hospital Hyderabad (LUH).*
DURATION: *From 13th August 2007 to 12th August 2008*
PATIENTS AND METHODS: *100 women between the ages of 20 to 29 years, with term gestation of 37 to 42 weeks, having singleton pregnancy with vertex presentation and bishop score of <6 were selected by Convenient Sampling technique. Women with previous caesarean section, fetal distress, para 5 or more, allergy to prostaglandin, uterine anomaly, cardiac disease, acute asthma or glaucoma were excluded. All information was recorded on preformed proforma and analyzed on SPSS version 11.P value <0.05 was taken as significant . Student T test and Chi square test was used, where appropriate to calculate the P value.*
RESULTS: *Total 100 patients were included in the study. Patients were divided into 2 groups.50 Patients in group A received induction with PGE_2 and 50 patients in group B received induction with PGE_1.*
Induction was succeeded in 50% patients who received induction with prostaglandin E_2 (In group A) and 74% patient's who received induction with prostaglandin E_1 (In group B). 25 (50%) patient's of group A and 37 (74%) patient's of group B delivered by spontaneous vaginal delivery while 25 (50%) patient's of group A and 13 (26%) patient's of group B requires cesarean section.
Results showed that prostaglandin E_1 is more effective for induction of labour than PGE_2 (P<0.004), however there is risk of hyperstimulation and post partum hemorrhage, which need careful monitoring of patient.
CONCLUSION: *Prostaglandin E_1 (Misoprostol) is more effective and safe for induction of labour than PGE_2.However the more frequent occurrence of hyperstimulation needs careful monitoring .Due to its high success rate it has reduce the Caesarean section rate and neonatal ICU admission.*

KEY WORDS: Induction of labour, Prostaglandin E_2, Misoprostol, Caesarean section, perinatal morbidity, perinatal mortality.

INTRODUCTION:

Induction of labour involves the artificial initiation of uterine contractions prior to their spontaneous onset, leading to progressive dilatation and effacement of the cervix and delivery of baby.

Induction rates range from10% to 25% in industrialized countries.[1] Induction of labour can be achieved by a variety of physical and biochemical stimuli designed for the purpose. However, approximately 20% of women having induction of labor end up with cesarean delivery.[2,3]

In the presence of unfavorable cervix, cervical ripening is done to increase the likelihood of successful induction[4]. Prostaglandin E2 (PGE2) given vaginally or intracervically has been shown to be effective for cervical ripening [5]. Misoprostol (PGE1), a prostaglandin analogue has gained worldwide acceptance for cervical ripening [6,7]. there have been several meta analysis of randomized control trials evaluating the use of misoprostol for cervical ripening and labour induction suggesting that misoprostol is effective but there is

concern that misoprostol may increase the rates of hyperstimulation and fetal distress [8,9].

The objective of this study was to evaluate the use of misoprostol compared with PGE2 for labour induction at term in terms of cesarean delivery, induction delivery interval, hyperstimulation and neonatal outcome.

PATIENTS AND METHODS:

This study was conducted in department of Obstetrics and Gynecology unit 1 of Liaquat university hospital (LUH) Hyderabad from 13thAugust 2007 to 12th August 2008.

Total 100 patients were selected randomly who meet the inclusion criteria and were divided into two groups. Group A includes 50 patients who receive induction with prostaglandin E_2 3mg vaginal tablet. While group B also includes 50 patients who receive induction with prostaglandin E_1 50 micro grams of vaginal tablet.

Sampling technique was convenient sampling technique. All the information was collected through a predesigned proforma.

Inclusion criteria were all the women with term gestation 37-42 weeks between 20-29 years of age, Singleton pregnancy with cephalic presentation and adequate pelvis and bishop score <6.

Exclusion criteria were all the women with previous caesarean section, > Para5, allergy to prostaglandin, fetal distress, marked uterine anomaly, cardiac disease, acute asthma and any contraindication for induction of labour.

Patients fulfilling the inclusion criteria were admitted after informed consent, bishop score was assessed and CTG was done. Prostaglandin $E_2$3mg pessary will be inserted vaginally at 6 hour interval for a maximum of 3 doses and 50 microgram (1/4th tablet) Misoprostol will be inserted in posterior vaginal fornix for every 6 hour till a maximum dose of 200 microgram. The dose was withheld in the presence of active labour,(>3 cm dilatation and regular uterine contractions). Artificial rupture of membrane was performed after head engagement when in active labour or when the bishop score reached > 6. Oxytocin infusion was started if indicated. Partogram was recorded; fetal heart rate monitoring was done. Fetal distress was labeled in the presence of meconium staining of liquor and abnormal fetal heart rate. Hyper stimulation was defined as tachysystole (at least 6 contractions in 10 minutes) or prolonged uterine contractions > 2 minutes accompanied by abnormal fetal heart rate tracing. In case of hyper stimulation, resuscitation was given in the form of left lateral position, oxygen and intravenous hydration. If hyper stimulation persisted women was given subcutaneous terbutaline. Labour induction was considered successful if the women entered the active phase of labour (cervical dilatation of > 3 cm and regular uterine contractions). Induction delivery interval, Caesarean section, fetal distress, failed induction and uterine hyper stimulation were recorded. Fetal outcome was also recorded. All data collected through the proforma and entered into the statistical package for social sciences in Abstract SPSS 10. P value <0.05 was considered as significant. Student T test and Chi square test was used, where appropriate to calculate the P value.

TABLE 1: DEMOGRAPHIC DATA:

S.No	Variable	Group A PGE2	Group B PGE1	P value
		Mean + SD		
1.	Age	23±3.03	25±3.07	0.127
2.	Gestational age	37.98±0.42	37.9±0.428	0.061
3.	Parity	1.64±1.81	1.54±1.77	0.374

TABLE 2: EFFICACY

Variable	Prostaglandin E2 n= 50	Misoprostol n=50	P-value
	Mean±SD	Mean±SD	
Induction Delivery Interval (time in hours)	15.20±6.43	11.44±5.49	<0.004

TABLE 3.
COMPLICATIONS, BISHOP SCORE, MODE OF DELIVERY & OXYTOCIN USED IN PATIENTS.

Variable	Mesoprostol n= Group B, 50 Number (percentage)	Prostaglandin E2 Group A, n=50 Number (percentage)
1. Bishop score		
0-2	30(60%)	32(64%)
2-5	20(40%)	18(36%)
2. Oxytocin used	43 (86%)	33 (66%)
3. Mode of delivery		
· NVD	25(50%)	37(74%)
· C/S	25(50%)	13(26%)
4. COMPLICATIONS		
Admission to Nursery (ICU)	4(8%)	5 (10%)
Meconium Aspiration	0 (0%)	1 (2%)
Hyper stimulation	1 (2%)	0 (0%)
Pyrexia	8 (16%)	7 (14%)
Postpartum Hemorrhage	7 (14%)	4 (8%)
Still Birth	0 (0%)	0 (0%)
Neonatal Death	0 (0%)	0 (0%)
Seizures	0 (0%)	0 (0%)

RESULTS:

Total 100 pregnant patients included in the study. Patients were divided into two groups. Group A includes 50 patients who receive induction with prostaglandin E_2 while group B also includes 50 patients who receive induction with prostaglandin E_1.

Table-I shows the Demographic data of the patients (which includes Patients Age,

Gestational age and Parity). No significant difference between age, gestational age and parity was found.

Regarding socioeconomic condition, in group A, 30(60%) patients belong to poor class, 10(20%) patients belongs to middle class while 10(20%) belongs to upper class. In group B, 40(80%) patients belongs to poor class, 8(16%) belongs to middle class while 2(4%) patients belongs to upper class.

Induction of labour was successful in 50% patients present in group A, while in group B, labour was successfully induced in 74% patients.

Regarding dose of prostaglandin, single dose of PGE2 was used in 22 (44 %) patients, 2 doses in 15 (30 %) and 3 doses were used in 13 (26%) patients. While in patients who were induced by misoprostol, single dose was used in 39 (78%) , 2 doses in 8 (16 %) and 3 doses were used in 3 (6 %) patients.

Induction delivery interval was less in patients who were induced with PGE1 than PGE2 (p= < 0.004) which is statistically significant. (Table 2).

In group A, oxytocin was used in 43(86%) of patients for augmentation while in group B it was used in 33(66%) of patients. There was no perinatal death in both groups. Hyperstimulation was seen in 1 (2 %) patient of misoprostol group and none of PGE2 group patient (Table 3).

DISSCUSSION:

Labour induction is a very important part of obstetric care. Prostaglandin E2 has been used effectively since 1968 for this purpose. Cost of prostaglandin E2 is quite high compared to Misoprostol (E1).[10] Misoprostol has been found safe in induction of labour in resource constrained hospital settings in developing

countries like ours, using basic clinical tools for monitoring [11].

The main measure of efficacy was taken to be the number of women delivering vaginally with in 24 hours of the first dose of prostaglandin in the two groups. Other measures of efficacy included the induction to delivery interval, the number of doses of the inducing agent administered, the number given oxytocin and the number of failed induction.

The measures of safety included the uterine hyperstimulation rates, the incidence of meconium aspiration and the neonatal outcomes

In this study vaginal route of administration of PGE_1 results in a shorter induction to delivery interval than PGE_2. In comparison with my study, other studies conducted by different authors shows that the vaginal administration of misoprostol is more effective than PGE_2 and oxytocin in terms of a shorter induction delivery interval[12,13] In our study, frequency of cesarean section was less in group in which labour was induced by misoprostol as compared to PGE2 group. Similar results were found in study conducted from Greece [14] and India [15].

Neonatal nursing admission was more common in patients of PGE2 group. No perinatal death was seen in either group in our study. No adverse neonatal effects have been reported by other studies [16].

Only one patient of misoprostol group had hyperstimulation, although another study from Lahore [17] show that use of misoprostol is associated with significant hyperstimulation, which has adverse effects for mother and baby. It has been associated with increased dose of 50 microgram and is recommended that 25 microgram misoprostol to be used for labour induction [16] to avoid meconium staining and hyperstimulation. Misoprostol has proved to be more efficient in stimulating labour compared to oxytocin and dinoprostin[17], but safety still need to be proven.[18]

In our setup, only 200 microgram tablet of misoprostol is available and splitting it into quarter result in 50 microgram of dose. It is required that 100 microgram tablet is made available and further studies using 25 microgram dose of misoprostol are carried out to establish safety of the drug.

CONCLUSION:

By this study, it is concluded that misoprostol is quite safe and very effective for induction of labour at least in low socioeconomic settings; by its high success rate it will reduce LSCS rate and neonatal ICU admission. However, the more frequent occurrence of uterine hyperstimulation needs carefully monitoring

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