Safety of Induction of Labor with Vaginal Prostaglandins (E2) in Grandmultipara

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Abstract

Objectives: The aim of this study is to determine safety of induction of labor with vaginal Prostaglandins (E2) in Grand Multipara.

Methods: Prostaglandin E2 was used in the form of vaginal tablets or gel in post fornix for induction as per protocol. Maternal and fetal data collected included age, parity, and indication of induction, bishops score, total dose of PGE2 used & complications of induction of labor. The data was collected and analyzed using Epi info - 6.

Results: 50% cases were induced for past dates, the ceasarean rate was high in the induction group (19.5%) compared to the control (12.5%) OR 1.69 RR 1.37(95% CI-1.07-1.75) difference was statistically significant. Adverse neonatal outcome was found to be similar in both groups. Special Care Baby Unit (SCBU) admissions were 19 in the induction group and 21 in the control group, which was not statistically significant. No severe maternal complications were observed such as infection or uterine rupture.

Conclusion: As there were no adverse events in the study, it may be safe to use vaginal PGE2 as method of choice for induction of labour in grand mutipara. However, RCT for further validation of these findings is recommended.

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Received: 09 May 2009
Accepted: 23 May 2009

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Paliwal V, *et al. OMJ.* 24, 184-187 (2009); doi:10.5001/omj.2009.36

Introduction

GrandMultiparity (GM) is considered a risk factor for maternal and neonatal morbidity, however the subject is still under debate. Several authors reported conflicting results as to whether pregnancy is high risk or not because of associated complications.[1-4] GM is a common event rather than exceptional in the Middle East. It is not related to socioeconomic status as in other parts of the world. Induction of labor with prostaglandins (PGE) offers the advantage of promoting both cervical ripening and myometrial contraction.

Dinoprostone (Prostin) is a synthetic form of naturally occuring PGE2. The use of PGE2 for cervical ripening by any route has been reported to improve vaginal delivery and decrease cesarean rate and instrumental delivery.[5] Induction of labor (IOL) using PGE2 in high parity group has been viewed as a stressful and a potentially dangerous procedure. Other reports contradict this notion and have reported it to be a safe and effective method of induction.[6-8] Initial reports on the use of prostaglandins in GM were documented by El-Leil who concluded that prostaglandin E2 vaginal pesseries was a safe and effective method for the induction of labour in grandmultiparous women.[9]

Yemimni et al. also used prostaglandins for induction of labour in grandmultiparous patients without serious complications, some with previous lower segment cesarean section Multiparity is common in Oman. [2,10-12] Total number of births in the hospital was 4300 per annum with 30-35% grandmultiparous. The over all induction rate is 15%. It is therefore important to study the safety, efficacy and outcome of vaginal PGE2 in comparison to spontaneous labor in grandmultiparous women in the population. FIGO defines (1993) GM as delivery of 5th to 9th infant, 10th and above is taken as great grand multi para.[13]

Methods

A prospective case control study was conducted at Sultan Qaboos hospital Salalah, Oman from the period of Jan 2004 - Oct 2006. 226 pregnant women Para 6 and above were included in the study as cases. The method of choice of induction of labor at the institution was using prostaglandins E2. The inclusion criteria were gestational age 37 weeks or more, singleton pregnancy with cephalic presentation. Exclusion criteria were previous cesarean section, any contraindication for vaginal delivery, suspected Cephalo Pelvic Disproportion or unexplained Antepartem Hemorrhage. 400 GM women who went into spontaneous labor during the same period were taken as controls.

Details regarding demographic data were collected from antenatal card. Indication for induction was decided by senior obstetrician (minimum of 2 doctors to avoid the selection bias) especially in patients with Diabetes Mellitus, Hypertension, and Intra Uterine Growth Restriction. After detailed examination and confirming the indication patients were shifted to labor ward for IOL. IOL was conducted only after fetal wellbeing was assured. The cervical score were noted and 1.5 mg/3 mg PGE2 tab or 1 or 2 mg gel was placed in the posterior vaginal fornix accordingly. Repeat Cardio Tocography (CTG) was done after one hour and if reactive and no pain was reported, then the patient was shifted

back to the ward, since there is always a 10-12 hour time period from putting Prostin and the commencement of labor.

The second dose may be unnecessary if given early. So the second dose was given only after 12 - 24 hours. Lesser dose and frequency were used to avoid complications. Artificial Rupture of Membranes (ARM) was performed when bishop score was ≥ 6. Oxytocin was used if required after ARM but not before 6 hours after the last dose PGE2. If the cervix was not favorable for ARM after 3 doses, the induction was considered to have failed and the woman was offered a caesarean section. The total dose of Prostglandins used as well as any complications during induction were recorded. All the patients were informed about the risk/benefits of the use of prostaglandins and informed consent was obtained. The study was approved by the ethical committee of the hospital. The data was collected on Performa and later transferred to the Epi informator and analyzed by Epi info-6. The level of significance was set to p-<0.05.

Results

A total of 226 grand multi Para had IOL with prostaglandins. 400 GM in spontaneous labor served as controls. The distribution of maternal and gestational age, gravida, parity, height, and weight were comparable in both the groups. There were no significant differences except in parity and gravidity which were higher in control group (Table 1).

Table 1: Maternal Characteristics: Mean (SD),Range

Characteristics	Cases -226		Control - 400	
	Mean(SD)	Range	Mean(SD)	Range
Age(years)	34.3(4.6)	25-46	34.6(4.5)	25-49
Gravida	9.0(2.1)	7-18	9.7(2.3)	7-21
Parity	7.4(1.8)	6-14	8.24(1.9)	6-16
Weight (Kgs)	87.3(15.2)	55-140	82.6(15.2)	49-132
GA in weeks	40.6(1.4)	37-43	40.21(.98)	37-43

SD: Standard Deviation

The most common indication for Induction was past dates (41 weeks+). (Table 2)

Table 2: Indications for Induction of Labor, n= 226

Indication	n (%)
Past dates	114(50.4)
PIH + Hypertension	32(14.2)
GDM+DM	28(12.4)
PROM	21(9.3)
Maternal Request	12(5.3)
Others*	19(8.4)

*macrosomia, abnormal CTG,oligohydramnios, fetal anomalies less fetal movements.

Out of the total 226 women who were induced, 60% received one dose, 90 (40%) had 2 doses and the remaining 34 (14.9%) received 3 doses. (Table 3)

Table 3: PGE2 Doses & Type used

Vaginal PGE2	Gel 1 mg n(%)	Gel 2mg n(%)	Tab 1.5 mg n(%)	Tab 3 mg n(%)
1st dose n=226	140 (62)	13 (5.8)	68 (30)	5 (2.2)
2nd dose n=90	62 (68.9)	7 (7.8)	16 (17.8)	5 (5.5)
3rd dose n=34	26 (76.2)		8 (17.8)	

Failed IOl - 7 cases 6 had lscs 1 delivered after repeat IOL after 6 days

Caesarean section rate was 19% in the study patients compared to 12.9% in and control group (Table 4).

Table 4: Indication for Caesarean Sections

Indication	Cases %	Control %	P value s<.05
Cs rate	44(19.46)	50(12.5)	s
Fetal distress	10(22.7)	20(40)	ns
NOPL	13(29.5)	8(16)	ns
Maternal request	10(22.4)	8(16)	ns
Others	5(11.3)	14(28)	
Failed IOL	6(13.6)		

NPOL: Non Progress of Labor

Table 5 summarizes the maternal and fetal outcome of induction of labor duration of first of labor. Labor was shorter in the induction group. 57.4% of women delivered within 24 hrs of induction and 83% delivered within 48 hrs. Seven cases delivered after three days of IOL Syntocinon was used in 19% cases for augmentation as compared to 11% in the control group. There were 10 cases of Tachysystole and 2 cases of Hyper stimulation. Seven patients had fever; three had PPH, one case of scoline Apnoea and one case of shoulder dystocia. Overall, outcomes were good in all cases.

The mean baby birth weight was not different in the two groups. No difference in adverse neonatal outcome was found between both groups (Table 5).

There were no still births, but there was one case of shoulder dystocia with birth weight of 4500 gms. The infant had poor apgar

Table 5: Maternal and Fetal Characteristics

Characteristics	Cases n=224 Mean(SD),range,n(%)	Control=400 Mean (SD), range,n (%)	Statistical significance
Length of 1st stage(hrs)	6.21(4.2),4- 48	8.96(6.9), 1-80	s
Length of 2nd stage(mts)	9(1.1), 6-120	15(3.6),10- 120	ns
Length of 3rd stage (mts)	8(5), 5-45	10(3),5-50	ns
Need for Oxytocin	43(19%)	44(11%)	s
Fetal weight(gms)	3470(569),2100-4810	3442(512),1860-4830	ns
Meconeum	38(17.5%)	59(14.75%)	ns
SCBU admissions	19(8.4%)	21(5.25%)	ns
APGAR 1mt	8.14(1.51),0-10	8.53(.98),2- 10	ns
APGAR 5mts	9.44(1.09)	9.65(.67)	ns
APGAR 1mts <6	10(4.4%)	7(2.2%)	s
APGAR 5mts <6	2(0.89%)**	3(0.75%)	ns

n: number,mts: minutes, hrs: hours, SD: Standard Deviation, S: Significant, p value <.05, ns: not significant
**1 case of shoulder dystocia 4.5 kg Apgar 0 at 1 mt 4 at 5 mts neonatal death on 4th day

score and died four days after birth. Special Care Baby Unit (SBCU) admissions were 8.4% in the study group and 5.25% in the control group, hence this was not statistically significant. The average duration of stay was 3.7 days ranging between 1-10 days and in the control group it was 3.8 days ranging between 1-8 days. Most of the babies were kept under observation for one day.

Discussion

Although doubts regarding the safety of labor and delivery in GM exist in books and literature, a multivariate analysis of parity and pregnancy outcome also reported a significantly increased risk of "any obstetric complication" among women of parity 4, 5, 6, and 7 to 8 when compared with primiparas by Abou elleil.[9] Reports from the Middle East and areas where multiparity is common did not support this notion. This study agreed with other reports regarding the use and safety of PGE2, Vaginal Gel and tablets for IOL in GM.[10-12] The increased C/S rate in IOL group was more due to religious reasons for tubal ligation and indications of IOL, lower threshold for LSCS in these cases, and associated age related risk factors not for Prostin as such. This rate was higher than <7% reported by Zamzami et al.[13] A potential risk of induction; however is caesarean delivery, which has been noted in many studies.

Sobande et al. reported a cesarean rate of 11% and 8% in the study group and controls respectively in their study of IOL in grand multipara.[7] Lower doses were used initially, either 1 mg gel or 1.5 mg tablets not the higher doses as recommended to minimize complications except in few cases (with poor bishop score). Even with higher doses, no complications were observed. There were no cases of rupture uterus in our series. It has been suggested that PG gel may be safer than the tablets in GM as its main effect is in cervical ripening and its contractive effect is considered minimal.[14-17]

This study showed that the outcome of Labor with IOL are favorable and comparable with patients in spontaneous Labor. Mecer et al. studied the complications and outcomes of elective induction and spontaneous labour and found no difference between the study group and the control group.[6] Induction of Labor alone may not have adverse effects but it also depends on the indication for induction.[17-20]

To conclude this study of small size and observational type the results showed that in good health care settings, the outcomes were favorable in grand multipara. GM alone should not be considered as a very high risk factor; instead the risk should be attributed on the basis of past and present history and not simply on the basis of parity. The use of Prostin E2 may be of used in developing countries, also in view of cost benefit and less manpower use in comparison to the use of Oxytocin for IOL. Overall, further prospective RCT are recommended to validate these observations.

Acknowledgments

The authors would like to thank the staff, doctors and patients who participated in this study. They also thank Dr Neesha Sharma for carefully reading the manuscript.

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