

A comparison of spontaneous labor with induced vaginal tablets prostaglandin E2 in grand multiparae

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ABSTRACT

Objectives: To compare the outcome of labor in grandmultiparous patients (para >5) who had induction of labor with prostaglandin E2 vaginal tablets with grandmultiparous patients in spontaneous labor, and to observe the complications during induction of labor.

Methods: A retrospective case control study was carried out at King Faisal Military Hospital, Khamis Mushayt between January 1993 through until December 1994. This included 64 grandmultiparous patients that were induced with prostaglandin E2 vaginal tablets. Ninety grandmultiparous patients who went into labor spontaneously served as controls. Maternal and fetal data extracted from their hospital record files included age, parity, indication for induction, Bishop score at induction, total dose of prostaglandin used and complications of induction of labor. Other information were length of labor, need for syntocinon augmentation, blood loss during the 3rd stage of labor, mode of delivery, birth weight, sex and Apgar score at 10 minutes.

Results: No serious complication of induction of labor such as rupture of the uterus was noted in the subjects

studied. There were no significant differences when the mean age and parity of patients in the 2 groups were compared ($P > 0.05$) but there was difference in the gestational age at delivery ($p = 0.00$). There was no significant difference in the mean length of first and 2nd stages of labor. The cesarean section rate was 11% and 8% in the cases and controls, while the need for syntocinon augmentation was twice in the cases than controls, 27% vs 14%. These were not statistically significant.

Conclusion: We conclude that induction of labor with prostaglandin E2 vaginal tablets may not have adverse effect on the outcome of labor compared with patients in spontaneous labor. It may be safe to use prostaglandin E2 vaginal tablets for induction of labor in the grandmultiparae. We recommend a randomized prospective trial to validate these observations.

Keywords: Prostaglandin E2, grandmultiparae, spontaneous labor.

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The grandmultiparae (para >5) has long been regarded as high risk pregnancy as of its associated medical and obstetric complications although this has been questioned by some authors.¹⁻⁵ At the same time prostaglandin induction of labour in this high parity order patients has been looked at as a dangerous procedure, and therefore the

manufacturers of the drugs have strongly advised against the use of the drug in the grandmultiparae. Literature search has revealed that there is no strong evidence to support this notion, possibly as grandmultiparity is not a common event in the Western world and also the fact that there is a tendency to decrease family size all over the world.⁶⁻⁷

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This might not be the case in our environment where approximately 40% of our pregnant patients are grandmultiparae. Initial reports on the use of prostaglandin in grandmultiparae were documented by El-Leil⁸ who concluded that prostaglandin E2 vaginal pessary is a safe and effective method of induction of labor in grandmultiparous women. Yamani et al^{9,10} also used prostaglandin for induction of labor in grandmultiparous patients without serious complications, some with previous lower segment cesarean section. Induction of labour is a common procedure in our hospital, 12% of obstetric procedures in our unit and therefore, we thought that it is important to study the complications of labor induction with prostaglandin E2 in our grandmultiparous patients and also compare the outcome of labor with grandmultiparous patients who had spontaneous labor. Our hospital conducts approximately 4000 deliveries a year and the period of study was between January 1993 until December 1994.

Methods. The hospital records of grandmultiparae (para>5) who were admitted for induction of labor between the 2 year study period at King Faisal Military Hospital were retrieved. Patients were included in the study if they had a singleton pregnancy with cephalic presentation, term pregnancy and absence of congenital anomaly. A history of one previous lower segment cesarean section was not regarded as a contraindication to induction of labor and therefore was included in the study if other criteria were satisfied. A total number of 64 patients satisfied these criteria and therefore represent the cases. Ninety grandmultiparous patients who were admitted with spontaneous labor during the same study period served as controls. Details regarding their demographic data and induction of labor together with delivery were obtained from the hospital record file. Induction of labor was usually decided upon at the antenatal clinic visit. Patients who are 42 weeks of gestation or more were automatically admitted for induction of labor by the attending obstetrician. In other cases, such as diabetes in pregnancy, pre-eclampsia and intrauterine growth restriction, the decision for induction of labor was usually taken by the senior obstetrician. On the morning of the admission, records of patients were scrutinized by the doctor on call for the indication for induction as well as the gestational age. General and systemic examinations were performed followed by abdominal and vaginal examinations. The cervical score using the modified Bishop score at induction was recorded and 1.5mg of prostaglandin E2 vaginal tablet was inserted into the posterior vaginal fornix. To ensure good dispersal of the tablet, the patient was instructed to stay in bed for 30 minutes. A non stress test was performed for one hour commencing

approximately 30 minutes after the insertion of the prostaglandin tablet. The patient was reassessed by the same obstetrician approximately 6 hours after the initial prostaglandin insertion and depending on the response of the cervix to the initial prostaglandin as indicated by the Bishop score, the dose was either increased by 1.5mg or the same dose was repeated. The total dose of prostaglandin allowed in the first 24 hours is 15mgs. On the 2nd day of induction, the patient was started with 1.5mg dose and this may be increased by 1.5mg 6-hourly as on the first day of induction. Induction was said to have failed if there was no change in the initial Bishop score after 24 hours of induction. Patients were transferred to the labor ward at the commencement of regular uterine contractions or when the cervix was deemed favorable for artificial rupture of membranes. The length of induction of labor which is the time interval in hours between the start of induction to the time of transfer to labor ward was recorded. The total dose of prostaglandin used as well as any complications during the induction were recorded. If tetanic contractions were noted during induction, the prostaglandin was retrieved from the posterior fornix and the patient was given Ritodrine 5 mgs intravenously. Labor was managed routinely. The length of first stage was taken as the time between the patients admission to labor ward in established labor and full dilatation of the cervix. Statistical analysis was carried out using the Statistical Package for Social Sciences (SPSS for MS WINDOWS, Release 6.0). Students test and simple ANOVA tests were used for quantitative variables while chi-square and Fishers exact tests were used for qualitative data. The level of significance was set to 0.05.

Results. There were no significant differences in the mean age and parity between the cases and the

Table 1 - Maternal and fetal characteristics.

Characteristic	Cases n=64	Controls n=90	Statistical difference
Age (yrs) Mean (SD)	33.8 (4.9)	32.9 (4.6)	P=0.2
Parity, Mean (SD)	7.6 (2.1)	7.3 (1.8)	P=0.3
Gestation at delivery (wks.) Mean (SD)	40.6 (-)	39.3 (-)	P=0.0
Birth weight (gms) Mean (SD)	3388.3 (590.4)	3060.0 (468.2)	P=0.13*
Still birth n (%)	2 (4)	1 (1)	
yrs=years, SD=standard deviation, wks=weeks, n=number *Adjustment done for gestation at delivery			

Table 2 - Characteristics of induction of labor.

Variable	Mean (SD)
Length of induction of labor (hrs)	17.0 (15.4)
Total dose of Prostaglandin tablets required (mgs)	5.3 (4.9)
Bishop score at the beginning of induction	5.8 (2.0)
hrs=hours, SD=standard deviation	

Postmaturity and diabetes were the popular reasons for induction of labor. Table 4 shows the characteristics of labor and outcome in the cases and controls. There was no statistically significant difference in the mean first and 2nd stages of labor in the cases and controls ($p=0.29$ and $p=0.13$), as well as the mean blood loss during the delivery ($p=0.15$). The mode of delivery was not significantly different in the 2 groups ($p>0.05$). Twenty-seven percent of those in the study group required syntocinon augmentation during the first stage of labor compared with 14% in the control group, but not significant statistically, ($p>0.05$).

Table 3 - Indication for induction of labor.

Indication	n %
Postmaturity	35 (55)
Diabetes	13 (20)
Hypertensive disease	3 (5)
Fetal growth restriction	3 (5)
*Others	10 (16)
* macrosomia, intra uterine fetal death, congenital malformation, heart disease	

Discussion. This study agreed with other reports regarding the use and the safety of prostaglandin E₂ vaginal tablets for induction of labor in the grandmultiparae.⁸⁻¹⁰ The early decelerations seen during the induction of labor and stillbirths seemed to be related to the indication for induction of labor rather than the prostaglandin itself. We had started induction of labor with a lower dose (1.5mg) of prostaglandin tablets as opposed to the recommended 3mg as we felt that complications would be minimized when small doses are used initially. The most dangerous complication of induction of labor by prostaglandin vaginal tablets is a rupture of the uterus. Although rare, it is seen most commonly in a previous lower segment scar with or without the use of syntocinon.¹¹ The posterior and lateral uterine rupture has been described in both intact and scarred uterus.^{12,13} However, in a large study by MacKenzie,¹⁴ they reported no incidence of rupture of the uterine scar following prostaglandin induction. The risk of uterine rupture appears to be between 0.3%-2% in women with a previous scar.¹⁵ There are suggestions that the greatest risk factor for uterine rupture is the use of syntocinon infusions and possibly multiparity. The state of the cervix is also

controls. The mean birth weight was no different statistically after adjusting for gestational age (Table 1). Table 2 showed the characteristics of induction, for example, the mean Bishop score at the start of induction, the mean total dose of prostaglandin used in mgs, the mean length of induction in hours. The indication for induction was shown in Table 3.

Table 4 - Characteristics of labor and delivery.

Characteristic	Cases n=64	Controls n=90	Statistical difference
Length of 1st stage (hrs) Mean (SD)	3.1 (1.8)	2.7 (2.7)	P=0.29
Need for syntocinon Number (%)	1.7 (26)	13 (15)	P>0.05
Length of 2nd stage (mins) Mean (SD)	8.3 (9.8)	5.9 (8.0)	P=0.13
Blood loss in 3rd stage (mls) Mean (SD)	223.6 (163.6)	186.4 (121.1)	P=0.29
Normal vaginal delivery Number (%)	56 (87.5)	83 (92)	P=0.33
Vacuum delivery Number (%)	1 (15)	0 (0)	-
Cesarean section Number (%)	7 (11)	7 (8)	P=0.50
n=number, hrs=hours, SD=standard deviation, mins=minutes			

thought to influence the generation of pressure within the uterus hence ruptures of the uterus. There were no cases of rupture of the uterus in our series, although syntocinon was used in 27% of the patients some of them with previous cesarean section scar, (9%) and this was the experience of El-Leil et al⁸ although none of the reported patients had a previous scar. Our study also contradicts the notion that multiparity is a risk factor in the genesis of rupture of the uterus. The mean total prostaglandin dose used was 5mg in our series while rupture of the uterus had been observed with lower doses.^{16,17} This reason may be due to the fact that the absorption of prostaglandin vaginal tablets and therefore its efficacy and safety is influenced by the vehicle and possibly the vaginal pH, humidity and oily lubrication. These factors might have affected the absorption of prostaglandin in our series, though this was not the experience of other authors.^{18,19} The mean Bishop score before induction of labor in our series might have contributed to the favorable results. It has been suggested that prostaglandin gel may be safer than the tablets in multiparous women as its main effect is in cervical ripening and its contractile effect is considered to be small. Although, this is not readily available in our environment, there is controversy regarding the appropriate route (intravaginal or intracervical).^{18,20,21}

Our study also revealed that the outcome of labor in grandmultiparae who had prostaglandin induction of labour compared favourably well with grandmultiparae control patients who went into labour spontaneously. Mecer et al²² studied the complications and outcome of elective induction and spontaneous labor and found no difference. One can infer that induction of labor on its own does not adversely affect the outcome of labor. The obvious drawback of this study is that it is a retrospective study with its limitations and also the fact the sample size is not large enough to negate other types of statistical errors. We conclude from our study that prostaglandin E₂ vaginal tablets may be safe for use in grandmultiparae and that the outcome of labor in induced patients may not differ from those who had spontaneous labor. We recommend further prospective randomized controlled trials to validate these observations.

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