ORIGINAL ARTICLE

PROSTAGLANDIN E2 GEL AND INTRACERVICAL FOLEY CATHETER FOR INDUCTION OF LABOUR IN WOMEN AFTER PREVIOUS CAESAREAN SECTION

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ABSTRACT

Objective: To evaluate the outcome of combined method of induction of labour (low dose prostaglandin E2 gel and intracevical Foley catheter) in terms of effectiveness and safety for induction of labour in women with previous caesarean section at term.

Material & Methods: This prospective descriptive study was carried out in Obstetrics & Gynecology Unit B, Lady Reading Hospital, Peshawar, Pakistan, from January 2015 to March 2016 It included 54 women with previous one lower segment caesarian section, with unfavorable bishop score who were induced with combined intracevical Foley catheter and low dose prostaglandin E2 gel (1mg) vaginally. All women reassessed after 8 hours and if bishop score not improved second dose of 1mg prostaglandin E2 gel inserted. Induction to delivery interval, mode of delivery, number of women delivering with in 24hours, indication for repeat C-section, maternal and neonatal outcome was assessed.

Results: Of the women 83.33% had a vaginal delivery and 16.67% had emergency caesarian section. Mean induction to delivery interval was 12.38 hours (range 10-24 hours). The most common indication for repeat caesarean section was arrest of progress in first stage of labour. Most common maternal complication was primary post partum haemorrhage (PPH) (7.4%).There was no case of uterine rupture. Similarly, no case of maternal mortality recorded. 88.88% of neonates had Apgar score of 8/10, 10/10 at 5 minutes and no perinatal mortality observed.

Conclusion: Induction of labour with combined low dose PG E2 gel and intracervical Foley catheter seems to be safe and effective method for women with previous caesarean section at term.

Key Words: Intracervical, Foley Catheter, Prostaglandin E2, Vaginal Birth, caesarian section, Induction, labour.

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INTRODUCTION

Induction of labour is a common intervention in daily obstetrics & it is aimed to deliver a healthy baby and to maintain the health of the mother[1,2]. It is estimated that 10% of women in whom induction of labour is required have a history of prior caesarean delivery[3]. With the increasing number of caesarian deliveries worldwide, the number of women with a scarred uterus who will need induction of labour in a subsequent pregnancy will also increase[4,5].

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There is a concern, however, that labour in women with a scarred uterus increases maternal and neonatal morbidity and mortality as compared to a repeat elective C-section particularly when labour is induced[6]. However, on the other hand, it is a well documented fact that the risks of C-section for women increase with the increasing numbers of caesarian deliveries. These include potentially life threatening complications including hemorrhage, surgical complications and morbidly adherent placenta[7,8]. It is evident, therefore, that promoting vaginal birth after previous C-section (VBAC) may help to avoid these complications in future pregnancies[9].

Current medical evidence indicates that cautious attempt at induction of labour in women with previous lower segment uterine scar can result in achieving successful vaginal birth in approximately 60-80% of cases[3,9,10]. However, till date there is insufficient infor-

mation available from randomized controlled trails on which to base clinical decisions regarding the optimal method of induction in women with a scarred uterus[11,12]. There are many reasons for the availability of relatively insufficient data about cervical ripening/ induction of labour on scarred uterus, including varied methods of induction. (i.e. pharmacological and mechanical methods and their combinations), wide variations in induction protocols (e.g. timing and dosage of cervical ripening agents) and inconsistent definitions of scar dehiscence and uterine rupture[10,11].

Due to the relative paucity of evidence on the most successful method for labour induction on scarred uterus, this study was designed in an attempt to find out the outcome in terms of effectiveness and safety of combined method of labour induction i.e. low dose prostagland in E2 gel and intra cervical Foley catheter together, in women with prior lower segment caesarean delivery at term.

MATERIAL AND METHODS

This prospective descriptive study was conducted in the department of Obstetrics and Gynecology Unit-B, Lady Reading Hospital, Peshawar. The study was approved by the institutional ethics committee. All women with one previous (lower segment) C-section undergoing induction of labour with an unfavorable cervix (Bishop Score< 6) from January 2015 to March 2016 were included in the study. The cases had singleton pregnancy, fetal gestational age of > 37 weeks, with cephalic presentation and reassuring fetal status. However, women with placenta previa, placental abruption and fetal congenital anomalies were excluded from the study.

Detailed history (including maternal age, parity and gestational age), general physical, systemic and obstetric examination including per vaginal examination for assessment of bishop score were carried out. Patients were subjected to baseline investigations (Hemoglobin, Full blood count, blood group and Rh factor and hepatitis serology status).

An informed consent was taken after detailed discussion of the procedure with the woman. Under aseptic precautions, Foley catheter No. 18F was inserted extra amniotic ally into the cervix. The balloon of the catheter was inflated with 40 ml normal saline and catheter pulled so that bulb rests on the internal cervical os. The catheter was stripped to the thigh of the women (time limit for catheter inside was decided to be 24 hours, if it is not spontaneously expelled). At the same time, half of the total dose of the prostaglandin E2 vaginal gel i.e. 1 mg (1.25ml) inserted into the posterior vaginal fornix. The intracervical placement of Foley catheter induces cervical ripening without inducing uterine contractions. However, there is a concern regarding possibility of infection especially if catheter is inside for more than 24 hours. On the other hand, prostaglandins affect uterine contractions predominantly. They do however, may cause overstimulation of the uterus and this effect seems to be dose related. To overcome the above mentioned side effects of both methods of induction, we reduced the dose of Prostaglandin E2 gel to half i.e.1.25ml (half of the standard dose of 2.5ml containing 2mg Dinoprostone which is routinely used for induction), assuming that the most common complications of Prostaglandin E2 i.e. uterine hyper stimulation and changes in fetal heart rate pattern would be avoided. Similarly, in our protocol we reduced the duration of cervical catheter in situ to a maximum of 24 hrs duration. At the start of procedure all patients received intravenous prophylactic antibiotics as per protocol.

Patients were reassessed after 8 hours (earlier if indicated) and if bishop score was not favorable second dose i.e. remaining half (1.25ml) was inserted. All women were kept under observation and fetal heart rate monitoring done at regular intervals. Progress of labour plotted on partogram. The induction was considered to be failed if uterine contractions/labour did not start within 24 hours after start of the procedure.

Indication for induction of labour, induction to delivery interval, mode of delivery, number of women delivering within 24 hours, baby's Apgar score at 5 minutes and neonatal admission to neonatal ward/ NICU were recorded. Maternal complications included uterine rupture (defined as separation of the uterine wall and visceral peritoneum), and cases of postpartum hemorrhage noted.

To ensure that all data were correct and reliable, patients files were checked in the medical record personally by the authors. For quantitative variables mean± standard deviation was calculated like age, period of gestation and parity. For other qualitative variables frequency and percentages were calculated. The results were presented through tables and figure. All the data were analyzed by using computer programme, SPSS version 20.

RESULTS

During the study period labour was induced with combined method of induction in 54 women with previous lower segment c-section, with an unfavorable cervix. Regarding baseline characteristics of the sample population, mean maternal age was 28.72(±3.82) years. Similarly mean gestational age was 39.15(±1.004) weeks and most of the women were Para 4(35.5%).

Table 1: Indications for induction of labour after prior caesarean delivery

Indications for induction of labour	No. of patients & percentage
Gestational age of >40 weeks	18 (33.33%)
Oligohydromnias	13 (24.47%)
Hypertensive disorder	9 (16.66%)
Insulin dependent diabetes	6 (11.11%)
Pre labour rupture of membranes	4 (7.40%)
Decreased fetal movements	3 (5.55%)
Unstable fetal lie	1 (1.85%)

Table 2: Indications for Repeat C section

Indications for repeat C-Section	No. of patients & percentage
Arrest of labour in first stage	=4 (44.44%)
Failed induction of labour	n=3 (33.33%)
Non reassuring fetal heart rates	n=2 (22.22%)

Table 3: Maternal and neonatal outcomes

Maternal and Neonatal Variables	No. of patients & percentage
PPH	n=4 (7.4%)
Apgar score of 8-10 at 5 minutes	n=48 (88.88%)
Apgar score of 6-8 at 5 minutes	n=6 (11.11%)
Admissions to neonatal ward	n=7 (12.96%)

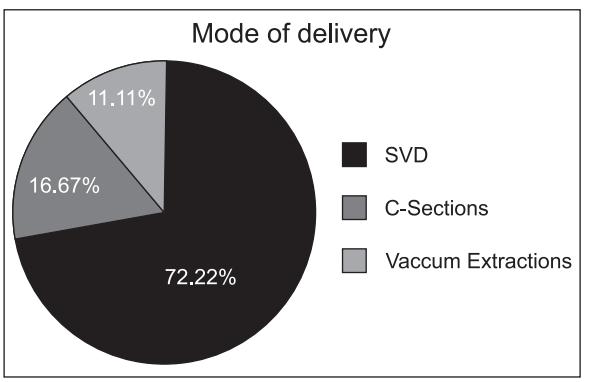

Figure 1: Mode of Delivery after induction with combined method in women with previous c-section

Indications for induction of labour have been summarized in Table 1. Similarly mode of delivery after induction with combined method of induction has been shown in figure[1]. It is evident from figure 1 that VBAC rate is 83.33% while caesarean section rate is 16.67%. Most common cause of repeat c-section was arrest of progress in first stage of labour. Indications for repeat caesarean section is shown in Table 2.

Furthermore, out of 41 women who delivered vaginally 91% delivered within 24 hours. Mean induction to delivery interval was 12.38 hours (range 10 hours -24 hours). Most common maternal complication was primary postpartum hemorrhage. No maternal and perinatal mortality observed. However, 7 neonates remained admitted in neonatal unit. Out of them 3 were infants of diabetic mothers and 2 had suspected infection. Furthermore, 1 baby had intrauterine growth restriction and low birth weight and 2 babies had hyperbilirubinemia. No case of uterine rupture and maternal febrile illness noted. Maternal and neonatal out comes is shown in Table 3.

DISCUSSION

Due to the rising rates of induction of labour especially in women with scarred uterus, safe and effective methods of induction have once again become a focus of interest and research. Different methods which are being used worldwide for cervical ripening are pharmacological methods like prostaglandins, non-pharmacological (mechanical) methods e.g. Foley catheter and their combinations[13,14,15]. Our study is first of its kind in Pakistan because literature search has shown that different methods of induction of labour have been used in women with unscarred uterus. However, international data is present on trail of induction in women with prior caesarean delivery[9,12,16,17]. Of the patients analyzed in our study 83.33% delivered vaginally (VBAC). This rate of VBAC in our study is higher than that shown by various studies in which either intracervical Foley catheter or PG - E2 were used individually in women with previous caesarean delivery at term[16].

A study conducted by Kehi S et al in Netherlands showed 71% VBAC rate when Foley intracervical catheter was used as sole method of induction in women with scarred uterus[17]. Similarly VBAC rates of 66.7-70% have been shown by different studies using intracervical catheter[18,9]. On the other hand, when PG E2 was used as the only method of induction in women with previous C-section, VBAC rates of 60-73% has been observed by different researchers[16,9]. In this regard our result is in agreement with studies performed by Perry K et al[19], and Barrilleaux PS et al[13], where combining both methods of induction increased the vaginal delivery rates to 90% as compared to when methods of induction were used individually in women with un scarred uterus.

In the current study, out of 45 women who delivered vaginally 91% delivered within 24 hours and the most probable reason for increased likelihood of vaginal delivery seems to be the combination of two methods of induction. Literature search also suggests that combining pharmacological and mechanical methods of induction increases the likelihood of vaginal delivery

within 24 hours[13,19,20]. On the other hand, Meeti et al and Ziyauddin et al showed rates of 30% and 61.9% of women who delivered within 24 hrs when intracervical catheter and PG E2 have been used respectively[18,16] as the only methods for labour induction.

Mean induction to delivery interval in current study was found to 12.38 hours (range of 10-24 hours). Literature reveals mean induction to delivery of 18.15-19.93 hours and 20.10 - 21.06 hours where intracervical catheter and prostaglandin E2 were used independently[9,16]. The shorter induction to delivery in our cases is may be due to the fact that both pharmacological and mechanical methods are working instantaneously for cervical ripening and uterine muscles stimulation. In the current study secondary/repeat C Section rate was 16.67% which is significantly lower as compared to other studies in which both methods were used separately[20]. Meeti et al observed rate of 33% (Foley catheter group) of repeat c section while Masood and Ziyauddin showed rates of repeat section of 26.6% and 40% respectively (PG E2 group)[18,9,16] in their studies.

We find no case of uterine rupture in the current study; this finding is in agreement with the work done by Bebbington et al[21]. In literature, prevalence of uterine rupture in women with a vaginal delivery after c section ranges from 0.5 to 2.9% with highest rates after the use of Prostaglandins[22,23,24,25]. The most probable reason of finding no case of uterine rupture may be the fact that we used half of the standard dose of PG E2 gel while other studies have used full dose of PG E 2 gel in one application. Another reason may be related to our implementation of strict protocol of induction and avoidance of second dose of PG E2 gel until the woman's bishop score has been assessed by consultant. On the other hand, one may suggest that the absence of uterine rupture in current study is due to a smaller number of patients in the sample.

Our data suggests that the most common cause of repeat c section in the study population was arrest of labour in the first stage 44.4% followed by failed induction 33.3% and non reassuring fetal heart rate patterns 22.2%. However, studies where PG E2 was used in standard dose for induction of labour, fetal distress was found to be the most common cause of repeat c section[16]. Mean induction to delivery interval in current study was found to 12.38 hours (range of 10-24 hours). Literature reveals mean induction to delivery of 18.15 -19.93 hours and 20.10 -21.06 hours where intracervical catheter and prostaglandin E2 were used independently[9,16].

LIMITATIONS

Our study has its own flaws; we had relatively smaller number of patients in our sample. All patients in the study group received prophylactic antibiotics, so we were unable to find exactly the association between our chosen method of induction and maternal/neonatal febrile morbidity. Another limitation was that BMI was not available for every patient. However, the strength of our study is that our data are reliable and all women were treated according to a locally set strict protocol under the direct supervision of in charge of unit with more than 20 years of experience in obstetrics.

CONCLUSION

Induction of labour with combined low dose PG E2 and intracervical Foley catheter seems to be safe and effective method for women who are managed in tertiary care hospital under intensive surveillance.

RECOMMENDATIONS

Further larger studies should be carried out to obtain definite results and find out the best method for induction of labour after prior caesarean delivery.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

Fatima SS: Conceived the idea ,planned the study and drafted the manuscript

Hussain SS: Helped in acquisition of data.

Rahin R: Critically revised the manuscript.

Liaqat N: Help in statistical Analysis.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.