**ORIGINAL ARTICLE**

# Maternal and Neonatal Outcome Following the Additional 3rd Dose of Vaginal PGE2 in Induction of Labour in Nulliparous

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## ABSTRACT

**Aim:**To determine the maternal and neonatal outcome following the additional 3rd dose of vaginal PGE2 in induction of labour in nulliparous.

**Methods:** This descriptive study was carried out in the Department of Obstetrics & Gynecology, Nishtar Hospital, Multan from November 2014 to May 2015. A total of 183 pregnant nulliparous females in reproductive age group i.e. 18-45 years were included.

**Results:** Mean age was 28.16±7.34 years.Mean gestational age in our study was 41.14±0.79. Mean interval between induction of labour and time of delivery was 3.18±1.77 hours. Caesarean section was seen in 87(47.54%) females, SVDs in 96 (52.46%), uterine hyperstimulation in 15(8.20%), PPH in 41(22.40%), APGAR score <7 in 30(16.39%) and neonatal unit admission was found to be in 33(18.03%) neonates.

**Conclusion:** This studyconcluded that additional 3rd dose of vaginal PGE2 in induction of labour in nulliparous is not associated with higher morbidity and mortality of mother and fetus.

**Keywords:** Labour, induction, prostaglandins, cesarean, hemorrhage.

## INTRODUCTION

Labor is a process through which the fetus moves from the intrauterine to the extrauterine environment. It is a clinical diagnosis defined as the initiation and perpetuation of uterine contractions with the goal of producing progressive cervical effacement and dilation. The exact mechanisms responsible for this process are currently not well understood[1]. Induction of labour is the intentional initiation of labour before spontaneous onset, for the purpose of delivery of the fetoplacental unit[2]. Induction of labour (IOL) needs to be considered when delivering the baby is a safer option for the baby, the mother, or both, rather than continuing the pregnancy, and when there is no contraindications for vaginal delivery[3].

The incidence of induction of labour is increasing nowadays[4].It is estimated that rate of induction of labour is approximately 10% of all deliveries[5]. In developed countries, induction of labour accounts for about 25% of all deliveries[6]. In developed countries, the proportion of infants delivered by induction of labour is as high as one in four deliveries. Between 1990 and 2009, the overall frequency of labor induction had been doubles, rising from 9.5% to 23.2%[7] and early term (in the 37th and 38th week) inductions quadrupled, rising from 2% to 8%[8]. The reason for this increase is unclear, although it may partly reflect a growing use of labor induction for post term pregnancies and an increasing trend toward elective induction of labor[9].

About 20% of pregnant women will have labour induced for variety of reasons. Induction does not usually involve just a single intervention but it is a complex set of interventions and as such present challenges for both clinician and mother[10]. Of the standard indications for labor induction, pregnancy-induced hypertension and post term pregnancies are among the most common, accounting for more than 80% of reported inductions[11]. The decision to induce labor before term is far more difficult, however. In such cases, there should be clear benefits to the fetus of premature delivery that far outweigh the potential problems associated with preterm birth. Although elective induction of labor (without medical or obstetric indications) is generally not recommended, logistic factors such as distance from the hospital or a history of rapid labor and delivery may be reasonable indications for elective induction[12].

Methods for induction of labour can be mechanical or pharmacological. Mechanical means of labour induction include the use of various types of catheters and hygroscopic dilators, introduced into the cervical canal or into the extra-amniotic space[13]. Pharmacological methods include intravaginal, endocervical or extra-amniotic administration of prostaglandin, such as dinoprostone or misoprostol[14]. Vaginal prostaglandins are a safe and effective way of induction of labour. Prostaglandins are produced naturally by the body. They are involved in ripening

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the cervix and on set of labour. Safety concerns for the mother or baby sometimes make it necessary to start labour artificially. Synthetic prostaglandins can be used and are available as vaginal tablets, gels, suppositories and pessaries[15].

The use of prostaglandins for cervical ripening and induction of labour administered by any route has been reported to improve the rate of vaginal delivery, and decrease the rate of caesarean section and instrument deliveries. Prostaglandin E2 acts on the cervix by dissolving the collagen structural network of the cervix. Prostaglandin E2 , dinoprostone, is available in 3 different preparations as a cervical ripening agent: controlled-release gel 10 mg (Cervidil), intravaginal 1 mg and 2 mg gel (Prostin), and intracervical 0.5 mg gel (Prepidil). Vaginal preparations (Prostin, Cervidil) are easier to administrate than intracervical (Prepidil) preparations. Standard dose of PGE2 is one cycle of vaginal PGE2 tablets or gel: one dose (3mg), followed by second dose (3mg) after 6 hours if labour is not established[16].

The objective of the study was to determine the maternal and neonatal outcome following the additional 3rd dose of vaginal PGE2 in induction of labour in nulliparous.

## MATERIAL AND METHODS

This descriptive study was carried out in the Department of Obstetrics & Gynecology, Nishtar Hospital, Multan from November 2014 to May 2015.A total of 183 pregnant nulliparous females in reproductive age group i.e., 18-45 years were included. Patients with scarred uterus, allergy to prostaglandins and medical illness (e.g. cardiac, diabetes mellitus and hypertension) were excluded. Induction of labour with additional 3rd dose of PGE2 was done and mode of delivery, interval between induction of labour and delivery, uterine hyperstimulation, Primary PPH, Apgar Score, Neonatal unit admission were noted

Mean gestational age in our study was 41.14 ± 0.79 weeks with majority of patients i.e. 112 (61.2%), were 40-41 weeks. Mean interval between induction of labour and time of delivery was 3.18 ± 1.77.Age range in this study was from 18 to 45 years with mean age of 28.16±7.34 years. Majority of the patients 79 (43.17%) were between 18 to 25 years of age as shown in Table-I. Maternal and neonatal outcome is shown in Table-II. Caesarean section was seen in 87 (47.54%) females, SVDs in 96 (52.46%), uterine hyperstimulation in 15 (8.20%), PPH in 41 (22.40%), APGAR score < 7 in 30 (16.39%) and neonatal unit admission was found to be in 33 (18.03%) neonates. Stratification of obstetrical outcome with respect to age groups and parity has shown in Table-III & IV respectively. Stratification of maternal and neonatal outcome with respect to age groups and gestational age has shown in Table-V & VI respectively while stratification of maternal and neonatal outcome with respect to interval between induction of labour and time of delivery is shown in Table VII.

Table-I: %age of patients according to age distribution (n=183).

| Age (years) | n | %age |
|---|---|---|
| 18-25 | 79 | 43.7 |
| 26.35 | 64 | 34.97 |
| 36-45 | 40 | 21.86 |

Mean±SD = 28.16 ± 7.34 years

Table-II: Maternal and neonatal outcome

| Outcome | | %age |
|---|---|---|
| Uterine hyperstimulation | Yes | 15(08.20%) |
| | No | 168(91.8%) |
| Mode of delivery | Vag | 96(52.46%) |
| | CS | 87(47.54%) |
| Primary PPH | Yes | 41(22.40%) |
| | No | 142(77.6%) |
| Apgar Score | Good | 153(83.6%) |
| | poor | 30(16.39%) |
| Neonatal unit admission | Yes | 33(18.0%) |
| | No | 150(82.0%) |

## RESULTS

Table-III: Stratification of Maternal and neonatal outcome with respect to age groups

| Outcome | | 18-35 years | 36-45 years | P. value |
|---|---|---|---|---|
| Uterine hyperstimulation | Yes | 12 (8.3%) | 03 (7.5%) | 0.856 |
| | No | 131 (91.6%) | 37 (92.5%) | |
| Mode of delivery | Vaginal | 74 (71.7%) | 22 (55.0%) | 0.716 |
| | Ceasrean | 69 (25%) | 18 (45.0%) | |
| Primary PPH | Yes | 40 (28.0% | 01 (02.5%) | 0.001 |
| | No | 103 (72.0% | 39 (97.5%) | |
| Apgar Score | Good | 114 (79.2%) | 39 (97.5%) | 0.007 |
| | poor | 29 (20.3%) | 01 (02.5%) | |
| Neonatal unit admission | Yes | 29 (20.3%) | 04 (10.0%) | 0.135 |
| | No | 114 (79.7%) | 36 (90.0%) | |

Table-IV: Stratification of Maternal and Neonatal Outcome with respect to gestational age

| Outcome | | 40-41 weeks (n-112) | > 71 weeks (n-71) | P. value |
|---|---|---|---|---|
| Uterine hyperstimulation | Yes | 09 (8.0%) | 06 (08.5%) | 0.921 |
| | No | 103 (92.0% | 65 (91.5%) | |
| Mode of delivery | Vaginal | 59 (52.7%) | 37 (52.1%) | 0.940 |
| | Ceasrean | 53 (47.3%) | 34 (47.9%) | |
| Primary PPH | Yes | 18 (16.1%) | 23 (32.4%) | 0.010 |
| | No | 94 (83.9%) | 48 (67.6%) | |
| Apgar Score | Good | 95 (84.8%) | 58 (81.7%) | 0.577 |
| | Poor | 17 (15.2%) | 13 (18.3%) | |
| Neonatal unit admission | Yes | 19 (17.0%) | 14 (19.7%) | 0.637 |
| | No | 93 (83.0%) | 57 (80.3%) | |

Table-V: Stratification of Maternal and Neonatal Outcome with respect to Interval between induction of labour and time of delivery

| Outcome | | ≤ 3 hours (n-123) | > 3 hours (n-60) | P. value |
|---|---|---|---|---|
| Uterine hyperstimulation | Yes | 04 (03.3%) | 11 (18.3%) | 0.000 |
| | No | 119 (96.7% | 49 (81.7%) | |
| Mode of delivery | Vaginal | 69 (56.1%) | 27 (45.0%) | 0.158 |
| | Ceasrean | 54 (43.9%) | 33 (55.0%) | |
| Primary PPH | Yes | 26 (21.1%) | 15 (25.0%) | 0.556 |
| | No | 97 (78.9%) | 45 (75.0%) | |
| Apgar Score | Good | 105 (85.4%) | 48 (80.0%) | 0.357 |
| | Poor | 18 (14.6%) | 12 (20.0%) | |
| Neonatal unit admission | Yes | 18 (14.6%) | 15 (25.0%) | 0.121 |
| | No | 105 (83.4%) | 45 (75.0%) | |

## DISCUSSION

Prostaglandin E2 acts on the cervix by dissolving the collagen structural network of the cervix. The controlled-release gel preparation (Cervidil) allows easier removal in case of uterine tachysystole with FHR changes and requires only a 30-minute delay before the initiation of oxytocin upon its removal compared with an interval of 6 hours for the gel[17].Advantages of PGE2 include patient acceptance, a lower operative rate than oxytocin, and less need for oxytocin augmentation when used with an unfavourable cervix (Bishop < 7). Cost savings may be realized by a reduction in operative deliveries and/or lengths of stay. PGE2 is a bronchodilator and is not contraindicated in women who suffer from asthma. In a prospective study of 2513 women with known asthma and who received PG, none had evidence of an exacerbation of their condition[18]. We have conducted this study to determine the maternal and neonatal outcome following the additional 3rd dose of vaginal PGE2 in induction of labour in nulliparous.

The mean age of patients in our study was 28.16 ± 7.34 years which was very much comparable to study of Ezechi et alwho had a mean age of 26 years. On the other hand[19], whereas other studyhad found mean age of 4 & 25 years respectively in their studies which is a little lower compared to our study[20].Mean gestational age was 41.14±0.79 weeks in this study which is almost similar to findings of another study, who had found mean gestational age of 41 and 40 weeks respectively for these particular patients[21]. Until recently, the most common practice has been to induce labor by the end of the 42nd week of gestation. This practice is still very common. Two more recent studies have shown that induction may increase the risk ofcaesarean section if performed before the 40th week of gestation, but it has noeffect or actually lowers the risk if performed after the 40th week[22].

In our study, caesarean section was seen in 87 (47.54%) females, SVDs in 96(52.46%), uterine hyperstimulation in 15 (8.20%), PPH in 41(22.40%), APGAR score < 7 in 30(16.39%) and neonatal unit admission was found to be in 33(18.03%) neonates. A study carried out in UK where additional dose of PGE2 was given and result were caesarean section (53.4%), SVDs (47.6%), uterine hyperstimulation (7%), PPH (19.8%), APGAR score <7 and neonatal unit admission was found to be (13.7%) in each group.

Several studies were published on the use of vaginal prostaglandin E2 for induction of labor at term. Kelly et al reviewed 52 studies examining 9402 women. They concluded that vaginal prostaglandin E2, compared with placebo or no treatment, reduced the likelihood of vaginal delivery not being achieved within 24 hours (18% vs. 99%; RR 0.19; 95% CI, 0.14-0.25). Cesarean delivery rates were not different between groups, although the risk of uterine hyperstimulation with fetal heart rate changes was increased (4.6% vs. 0.51%; RR 4.14; 95% CI, 1.93-8.90)[23].

In clinical practice, however, it is clear that such dosage regimes are frequently exceeded when initial attempts with recommended doses are unsuccessful. A survey of obstetric units in England conducted in

2007 revealed that 86% of the units were using more than the recommended dose of vaginal PGE2 tablets.In a study by Chan LY et al on 706 deliveries, 411 had favorable Bishop's scores and no vaginal prostaglandin E2 for cervical priming was required (group A); 268 required one or two doses of vaginal prostaglandin E2 for cervical priming (group B); and 27 required three or more doses (group C). The incidence of cesarean section was significantly higher in group C (48.1%) than in group A (19%) and group B (16.4%)[24].

## CONCLUSION

This studyconcluded that additional 3rd dose of vaginal PGE2 in induction of labour in nulliparous is not associated with higher morbidity and mortality of mother and fetus.

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