Original Article

Mean Induction to Delivery Interval with Concurrent Oxytocin in Females While Requiring Second Dose of Dinoprostone in Labour

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Abstract

Objective: To assess the mean induction to delivery interval with concurrent oxytocin in females, while requiring a second dose of dinoprostone in labour.

Methodology: Descriptive case series study was conducted in Unit 4, Department of Obstetrics & Gynecology, Lady Aitchison Hospital, Lahore from July 2018 to Dec 2018. Female of age 18–35 years, primigravida, presenting at gestational age >37weeks on LMP, in labour (cervical os > 3cm). Then, females were given oxytocin infusions, at 1mu per minute (or 3 ml per hour) as starting dose, which was doubled each 30 minutes until up to maximum 32 mu per minute for achieving effective uterine contraction without foetal cardiac rate abnormalities. The time of the administration of oxytocin and dinoprostone was noted. Then females were followed up till delivery. At the time of delivery of the placenta, time was again noted. The induction delivery interval was calculated. All information was collected via study proforma.

Results: The mean induction delivery interval was 8.83±3.38 hours. Stratification of age and gestational age of women did not show a significant difference for mean induction delivery interval time. However, patients in the elderly age group (27-35 years) and higher gestational age (40–41 weeks) had short mean induction to delivery interval. Women with higher BMI had higher delivery interval as compared to women with lower BMI values.

Conclusion: Labour induction with concurrent oxytocin infusion and second dose of dinoprostone reduce/shorten the mean induction to delivery interval time. It will also help reduce the burden of obstetricians and early completion of delivery process.

Keywords: Induction, Delivery, Interval, Concurrent, Oxytocin, Dinoprostone

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Introduction

The treatment or procedure that induces delivery and childbirth is known as labor induction. Pharmaceutical and non-pharmaceutical techniques can be used to induce labour. Dinoprostone or misoprostol (prostaglandin E2 or prostaglandin E1 analogue respectively) is the most often used pharmacological therapies.[1] Dinoprostone, commonly referred as Prostaglandin E2, is a prostaglandin that occurs naturally and is utilized as a medicine.[2] It is prescribed for labour induction, postpartum bleeding, pregnancy termination and to retain the ductus arteriosus open in newborn infants.[3] The labour induction is an intentional beginning of uterine contractions before their natural onset, resulting in a gradual cervical dilation and

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effacement and birth of the baby. Cervical ripening is the most essential element of the labour induction procedure and the most significant indicator of success when induction is required. The cervix's ripening makes labour more easier and enhances the chances of a vaginal birth.[4] For individuals with an unfavorable cervix that does not respond to the initial dosage of dinoprostone for cervical ripening, a subsequent vaginal dinoprostone insertion is a safe and effective option, and its usage is linked to decreased caesarean section rates.[5] One study reported that mean induction delivery time was 10.6±4.2 hours with concurrent oxytocin in females requiring second dose of dinoprostone in labour.[6] Another study reported that mean induction to delivery interval was 10.68±2.90 hours with concurrent oxytocin in females requiring second dose of dinoprostone in labour.[7] But one study reported that mean induction delivery time was 26.7±30.2 hours with simultaneous oxytocin in females requiring second dose of dinoprostone in labour.[8]

Rationale of this study is to assess the mean induction to delivery time with concurrent oxytocin in females requiring second dose of dinoprostone in labour. Literature has shown that administration of a second dose of dinoprostone with concurrent oxytocin can reduce the duration of labour and early delivery. But controversial results have been noticed in literature. Moreover, there is no local evidence present, which could help us in determining the effectiveness of simultaneous oxytocin with dinoprostone as second dose in induced females for vaginal delivery. However, this study has been conducted to find local evidence and implement the use of concurrent oxytocin in females requiring a second dose of dinoprostone to reduce the duration of labour.

Methodology

This descriptive case series was conducted at Department of Obstetrics & Gynaecology, Lady Aitchison Hospital, Lahore. The study duration was six months from July 2018 to Dec 2018. Women with >28 weeks of gestation, age 25–40 years and grand multipara were included. Women with multiple fetus, females with gestational diabetes, hypertension, preeclampsia, eclampsia, anemia or excessive blood loss, previous cesarean section, meconium-stained liquor, fetal anomaly, PROM, macrosomia (>4kg on ultrasound) and cephalo-pelvic disproportion were excluded. Informed consent was obtained. Demographic information (name, age, gestational age, BMI) was also obtained. Then, females were given an oxytocin infusion started at 1mu/minute (3 ml/hour) and was doubled every 30 minutes to a maximum of 32mu/minute to achieve effective uterine contractions (3 moderate in 10 minutes) without fetal heart rate abnormality. The time of the administration of oxytocin and dinoprostone was noted. Then, the female was followed until delivery. At time of delivery of placenta, time was again noted. The induction to delivery interval was calculated (as per operational definition). All this information was collected through proforma. All the collected data were entered and analyzed through SPSS 21.

Results

Mean age of women in this study was 26.10±4.71 years. Mean gestational age of women was 39.88±0.89 weeks. Mean BMI of women was 22.53±1.60. Mean induction to delivery interval was 8.83±3.38 hours. (Table I)

Insignificant difference was seen in induction to delivery interval according to age groups (p-0.769). Mean induction to delivery interval in relation to gestational age did not show any significant difference i.e. 38-39 weeks: 9.62±252 and 40-41weeeks:8.43±3.70, p-value=0.097. Women with lower BMI had shorter induction to delivery interval as compared to women with high BMI values i.e. 18-21: 6.50±2.60 and 22-25: 9.42±3.31, p-value=0.000. (Table II)

Table I: Demographic characteristics and complication of the patients (n=212)

Variables	Statistics		
	Mean±SD	Minimum	Maximum
Age (years)	26.10±4.71	19	35
Gestational age (weeks)	39.88±0.89	38	41
BMI	22.53±1.60	18.60	25
Delivery interval	8.83±3.38	02	18

Table II: Delivery interval according to age, gestational age and BMI (n=212)

Variables		Delivery interval	P value
		Mean±SD	
Age groups	18-26 years	8.91±3.70	0.769
	27-35 years	8.71±2.89	
Gestational age	38-39 weeks	9.62±2.52	0.097
	40-41 weeks	8.43±3.70	
BMI	18-21	6.50±2.60	0.001
	22-25	9.42±3.31	

Discussion

The ideal approach for inducing labour is one that is safe, painless, affordable, pleasant, and effective. Today, however, such a flawless approach is not available. The majority of labour induction procedures attempt to replicate the physiological pattern of cervical dilation and effacement followed by uterine contraction, although most only achieve a portion of the natural process to labor and birth. The most common procedures for inducing labour include cervical ripening as well as the injection of oxytocin, dinoprostone, and misoprostol.[9] The most common technique of induction of labour is sequential, in which prostaglandins are administered for cervical softening and then oxytocin infusions are administered for additional labour augmentation if bishop scores improve. This approach is the safest; nevertheless, researches have been published on the combined use of prostaglandin and oxytocin preparations to reduce the time between induction and delivery without any raised the likelihood of adverse effects.[8,10] The efficacy of induction is determined on the status of the cervix. Females with an unfavorable cervix who n't yet went through a cervical ripening before labour had a longer labour and a higher cesarean section rate. In this study mean induction to delivery interval was 8.83±3.38 hours. Stratification of age, gestational age and parity status of women did not show a significant difference for mean induction to delivery interval time. However, patients in the elderly age group (27–35 years), and higher gestational age (40–41 weeks) had short mean induction delivery time.

Women with a higher BMI had higher induction delivery interval compared to women with lower BMI value. Tan in his study reported that mean induction delivery time was 10.6±4.2hours with concurrent oxytocin in females requiring the second dinoprostone in labour.[6] A local study from Pakistan also reported that mean induction delivery time was 10.68±2.90 hours with concurrent oxytocin in females requiring the second dinoprostone in labour. Results of this study regarding mean induction delivery time was consistent with the above-mentioned studies, but the mean induction to the delivery time interval was a bit shorter when compared with the above-mentioned studies. Contrary to these findings, one study reported that mean induction delivery time was 26.7±30.2 hours with concurrent oxytocin in females requiring the second dinoprostone in labour[8], which is quite higher when compared with Tan Pc and Pakistan local study as well as this study.

The therapeutic utilization of oxytocin to achieve cervical ripening is restricted by its extended induction time as well as low vaginal delivery effectiveness. When oxytocin is compared to vaginal prostaglandins to achieve cervical ripening in the third trimester, oxytocin causes a decreased vaginal delivery rate in 24 hours.[14] Importantly, long-term oxytocin usage has been linked to a higher risk of peripartum problems, including heavy bleeding following childbirth.[11] Despite these drawbacks, oxytocin seems to be the only agent for achieving induction that may be utilized in parturient who have had previous uterine surgical procedure and want to try labour when mechanical techniques were not an option (such as, closed cervix). Until the adequate cervical dilatation for mechanical techniques, oxytocin could be administered for the ripening of cervix. The use of intravenous low-dose oxytocin in conjunction with a recoverable dinoprostone vaginal insert was found to enhance uterine contractile function while also promoting cervical ripening. The administration of both medicines at the same time resulted in a shorter labour with less uterine activity.[12]

Conclusion

Keeping in mind the results of this study, it can be concluded that labor induction with concurrent oxytocin infusion and dinoprostone reduced/shorten the mean induction to delivery interval time. It will also help to reduce the burden of obstetricians and early completion of delivery process.

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