ORIGINAL ARTICLE

Factors Associated with the Failed Induction of Labour in Post-Term Pregnancy at a Tertiary Care Hospital in Karachi, Pakistan

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ABSTRACT

Objective: To determine the factors associated with failed induction of labour in post-term pregnancies attending a tertiary care hospital in Karachi, Pakistan.
Mehtods: This cross-sectional study was conducted at the Department of Gynecology and Obstetrics, Unit II, Civil Hospital, Karachi. During January to July, 2016. Women with a gestational age of 40 weeks + 6 days to 41weeks + 0 days were included in the study. Obstetric history, maternal age, BMI, gestational age, Bishop score, induction to delivery interval and mode of delivery were noted. Failed induction of labour was considered when patients delivered abdominally. Descriptive statistics were calculated and chi-square test was applied post stratification where p-value < 0.05 was considered statistically significant.
Results: 140 women met the inclusion criteria. The mean age of study subjects was 32.1 ± 2.9 years. Induction of labour failed in 78.6% of patients. Prolonged latent phase of labour was observed in 27.9% and a prolonged 2nd stage of labour obsereved in 17.1%. A Bishop score > 5 was in 81.4%. BMI > 24.9 was in 47.1%. Spontaneous rupture of membrane (SROM) was in 27.1%.
Conclusion: Induction of labour failed in 78.6% of post-term pregnancies in our study. A prolonged latent phase of the first stage of labour showed a significant association with failed induction of labour.

Key words: Frequency, Failed induction of labor, Factors, and Post dates pregnancy.

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INTRODUCTION

Induction of labour (IOL) is an intervention whereby cervical ripening is artificially initiated in order to induce uterine contractions, which result in progressive cervical dilatation and effacement, facilitating the birth of the baby through the vaginal canal. This is one of the commonest procedures performed in obstetrics. IOL is indicated in any situation where the mother or fetus is at risk by waiting for spontaneous labour. Several studies showed an increase rate of caesarean sections compared to spontaneous vaginal delivery following induction of labour[1-3]. In the past decade, the rate of IOL has increased; some institutes had a high rate as 40%. This rise might be due to certain medical disorders in pregnancy or purely obstetric indications. It has been observed that the duration of IOL played a role in the failure of induction. A longer duration of induction is associated with a greater risk of caesarean delivery. Conversely, a shorter duration of induction is associated with better chances of having a normal vaginal delivery. The rate of caesarean delivery was also largely dependent on individual physician's decision[5-6].

Latest studies indicated that induction of labour is carried out in 9-33% of all pregnancies annually and the success primarily depends on the Bishop score and parity[8-9]. When IOL is performed for the sake of convenience, it is known as an elective IOL. Case-controll studies and randomised controlled trials

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reported that elective inductions led to more operative deliveries, a greater need for pain relief, but less meconium during labour[2].

There are different protocols for the management of post-term pregnancies in Europe[10-11]. The predisposing factors for a post-term pregnancy identified as nulliparity, advanced maternal age and obesity[12-13]. Ultrasound scans done in early pregnancy play a role in reducing the rate of post-term pregnancy. Research revealed that a prolonged latent phase of labour was associated with a prolonged active phase of labour[14]. Increased rates of complications such as chorioamnionitis and postpartum hemorrhage was reported following a prolonged latent phase 6 hours and 12 hours respectively[21]. Unsurprisingly, the duration of IOL impacts costs associated with prolonged labour; this must be considered. Rayamajhi tried to identify the causes of failed IOL and showed higher rates being associated with numerous factors such as multiparous women, advanced maternal age, obsesity, a low Bishop score <5, pre-term and post-term pregnancies, macrosomia and a prolonged latent phase of labour[15]. Our study aimed to determine the factors associated with failed IOL in post-term pregnancies in patients attending a busy, public sector hospital in Karachi, Pakistan.

METHODS

This cross sectional study was conducted in the Obstetrics & Gynecology, Unit II, Civil Hospital, Karachi between January to July, 2016. Consecutive sampling was used for the study. The inclusion criteria were: primiparous women, maternal age between 18 and 45 years, BMI between 18.5 and 24.9 kg/m^2, gestational age between 40 weeks + 6 days to 41weeks + 0 days and a singleton pregnancy confirmed on ultrasound scan. Exclusion criteria included those women with multiple gestations, previous caesarean section, diabetes mellitus or cardiovascular disease.

Women with the findings of polyhydramnios or oligohydramnios on pelvic ultrasound were also excluded from the study. Informed consent was taken from each patient included in the study. Data was collected once the patient was admitted to the labour room for IOL using a structured proforma. Information obtained from each patient included their obstetric history, maternal age, body mass index (BMI), Bishop score, induction to delivery interval and mode of delivery.

The frequency of failed IOL was noted. All recorded data was entered into SPSS version 19 for statistical analysis. Descriptive statistics were calculated and stratification was done to see the effect of modifiers on outcome. Post stratification chi square test was applied considering $p \leq 0.05$ as significant. Of note, the latent phase of labour in this study was defined as beginning at the onset of uterine contractions and concluding once the cervix had achieved a 3 cm dilatation. Failed IOL was defined as IOL that ends in a cesarean section. This may be due either to a failure in onset of uterine contractions, ineffective uterine contractions and/or failure of the cervix to efface or dilate after 8 hours following a second dose of PG-E2, in this study.

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008. Informed consent was obtained from all patients for being included in the study.

RESULT

A total of 140 women met the inclusion criteria The mean age of study subjects was 32.1 ± 2.9 years. The mean current gestational age was 41.2 ± 0.4 weeks. The mean duration of latent phase of labor was 16.0 ± 4.7 hours. The duration of latent phase of labor was stratified into two groups. Stratification according to age, gestational age, duration of latent phase of labour and duration of 2nd stage of labor was done.

The results showed a statistically significant association of failed IOL with duration of the latent phase of labour (p=0.016). No significant association of IOL was found with age (p=0.207), gestational age (p>0.999) and duration of the 2nd stage of labour (p=0.626).

Table 1: Sample Characteristics (n= 140)

Characteristics of Study mothers	N	(%)
Age (Mean ± SD): 32.1 ± 2.9 years		
Income in Pakistani Rupees per month (Mean ± SD): 10,809 ± 1.3		
Gestational age (Mean ± SD): 41.2 ± 0.4		
Educational level		
1. No education	90	64.3
2. 5 years education	20	14.3
3. 8 years education	10	7.1
4. 10 years education	20	14.3
Socioeconomic status		
1. Middle	60	42.9
2. Low	80	57.1
Occupation		
1. Employed	39	27.9
2. Unemployed	101	72.1
Booking status		
1. Booked	56	40.0
2. Not booked	84	60.0
Body mass index (Kg/m)^2		
1. Underweight	06	4.3
2. Normal	89	63.6
3. Overweight	25	17.9
4. Obesity	20	14.3

Table 2: Frequency distribution of induction of labour according to prolonged latent phase of labour (n=140)

Outcome of prolonged latent phase of labour		(IOL)				TOTAL
		Successful (n=30)		Failure (n=110)		
		n	%	n	%	
Prolonged latent phase of labour	Yes (n=39)	17	43.6	22	56.4	39
	No (n=101)	13	12.9	88	87.1	101
TOTAL		30	21.4	110	78.6	140

Table 3: Frequency distribution of induction of labour according to maternal age (n=140)

Age group	(IOL)			P-Value
	Successful (n=30)	Failure (n=110)	TOTAL	
≤ 30 years (n=41)	6	35	41	0.207
> 30 years (n=99)	24	75	99	
TOTAL	30	110	140	

DISCUSSION

The results of our study are consistent with other studies Literature suggested that prolonged first stage of labour, in particular the latent phase, is associated with a risk of failed IOL. The artificial IOL, is a common intervention, which is being practiced more often than before, i.e 20% in almost all obstetric settings.[16-17] Cervical ripening on the other hand is the softening of the cervix, defined as a prelude to the onset of labour. This may occur naturally or by different method of IOL, i.e. physical or pharmacological interventions[18-20].

In one study, 18% of the pregnant population undergoing IOL due to different indications had a failure of IOL (at term) and the majority of failures were in nulliparous women. this suggested it that was a significant risk factor that may lead to emergency caesarean delivery. Failed induction was 4.6 times more likely in nulliparous subjects as compared to multiparous women. This association was shown in many studies[21-22]. A meta-analysis of 19 randomised controlled trials showed that IOL performed routinely at > 41 weeks gestation was less associated with perinatal mortality compared to situations where expectant management was planned[23].

Majority of the previous literature showed that IOL in preterm pregnancies was due to PROM (premature rupture of membranes), fetal growth restriction, smaller gestational age, decreased fetal movement or hypertensive disorders. In such circumstances, the end result is ususally caesarean delivery due to either fetal distress, non-progress of labour or signs of chorioamnionitis. Pre-term pregnancies mostly present with poor Bishop score. Therefore, a higher incidence of failure of induction is noted in these pregnancies[24, 26].

Women with a poor obstetric history are induced earlier i.e. around 40 weeks as they have an unfavorable cervix. Bad obstetric history itself has a role on maintaining a low threshold for caesarean section, as both the physician and patient may be anxious regarding the baby's safety. The duration of induction is also a known risk factor. Longer duration of induction associated with a greater risk of failed induction and therefore caesarean delivery[27]. Higher birth weight fetuses also increased the chance of failed IOL[28]. In our study, macrosomia was seen as risk factor for failed IOL. Failure of induction was seen 2.5 times more in women having macrosomic babies compared to those with normal weight fetuses.

CONCLUSION

Induction of labor failed in 110 post-term women (78.6%). A prolonged first stage of labour, particularly a prolonged latent phase, had a significant association with failed IOL.

Study Limitations: There were some limitations to this study. The present study included a single-center experience and a non-randomized study design. The sample size was small and the study was carried out in an urban environment so the results cannot be generalised to larger populations.

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