ORIGINAL ARTICLE

An Overview of Factors Associated with Failed Induction of Labour in a Tertiary Care Hospital

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ABSTRACT

Aim: To evaluate the factors associated with failed induction of labour and feto maternal outcome with induction of labour.
Study Design: A cross sectional study.
Place and Duration of Study: Department of OBS & GYNAE Avicenna Medical College and Hospital, Lahore from January 2019 to December 2019.
Methodolgy: A total of 90 subjects were evaluated keeping in view the inclusion and exclusion criteria. Induction was considered successful if the patient delivered vaginally and failed if ended up in caesarean section.
Results: 67% (60) patients delivered by caesarean section and 33% (30) by vaginal delivery. The average induction delivery interval was 19 hours. The following factors were associated with increased rate of failed induction : Bishop score < 5, Gestational age > 41 weeks, Oligohydramnios, Prelabor rupture of membranes, Hypertensive disorders of pregnancy, Induction-delivery interval greater than 24 hours, Absence of dating scan, meconium stained liquor, small for gestational age and macrosomic babies. All were found to be statistically significant with a p value of less than 0.05. The study also showed that induction of labour is not associated with any major intrapartum and postpartum feto maternal complications.
Conclusion : Most common indication for induction of labour was post dated pregnancy. Other major indications were co morbid fetomaternal conditions which quite seemed to be unavoidable in most cases of failed induction. On other hand case selection for induction of labour is vital for achieving outcomes similar to spontaneous labour.
Keywords: Induction of labour, prelabor rupture of membrane, fetomaternal complications

INTRODUCTION

Induction of labor (IOL) has become one of the most common interventions in modern obstetrics.[1] Innovations in diagnostic and screening methods in obstetrics led to the early detection of maternal and fetal conditions, which indicate artificial termination of pregnancy before the onset of spontaneous labor[2]. Induction of labor is frequently used to avoid serious complications to the mother or the fetus, arising from conditions, such as: pre-eclampsia; abnormalities of amniotic fluid , intrauterine growth restriction (IUGR); and post-term pregnancy. Induction for the social reasons on the request of patient and her family is also becoming one of the common causes for induction.[3] Nevertheless, IOL may result in undesirable effects, such as increased cesarean section (CS) rates, post-partum hemorrhage (PPH), and fetal distress, therefore, it should only be considered when the benefits to the mother and her fetus outweighs the risks of waiting for spontaneous onset of labor.

It is well established that labor has to be induced in approximately 20-25 % of pregnancies.[3] but the rate of induction is influenced by the location and institutional protocols as well. However on the other hand induction does fail in many of the induced pregnancies. Proper selection of patients with valid indications is required to decrease the failure rate of induction which is 20% as reported in literature[4]. Different factors attributable to failed induction are poor bishop score, pregnancy complicated by hypertensive disorders, (PROM) and gestational diabetes naming among a few[5-6]. There are several methods for labor induction, however the preferred method is intra-cervical prostaglandin E2 (PGE2-cerviprime). It induces or accelerates the maturation of cervix also known as cervical ripening and stimulates the myometrial activity[5,7,8]. The main objective of this study was to evaluate the factors associated with failed induction and its impact on fetomaternal morbidity .

Received on 23-02-2020
Accepted on 12-07-2020

METHODOLOGY

A retrospective cross sectional study was carried out in the Department of Obstertrics & Gyanecology, Avicenna Medical College and Hospital, Lahore .In particular , we tested the risk factors associated with failure of induction. Secondary outcome measures noted were induction-delivery interval, neonatal condition at birth and maternal complications during the process of IOL. A total of 90 patients attending the labour room from January 2019 to December 2019 for labour induction were included in the study. The inclusion criteria were as follows singleton pregnancy, 37-42 weeks gestation, the absence of active labour, alive fetus with reactive CTG cephalic presentation and no contraindication to vaginal delivery.

Induction of labour in the patients was carried out with prostaglandin E_2 (PGE_2 vaginal tablets 3mg (Dinoprostone). Bishop score had been assessed at the initiation of

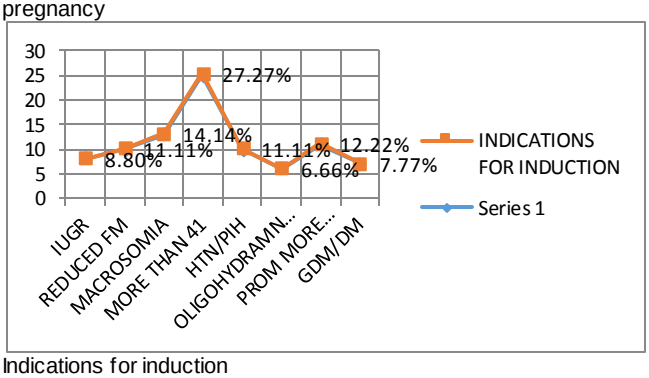
induction and for subjects with Bishop score less than 6 , vaginal PGE tablet was inserted into the posterior vaginal fornix. A non stress test was performed 30 minutes before and after the insertion. The patient was reassessed 6 hours after the initial PGE_2 insertion and depending upon the response of cervix as indicated by the bishop score, another dose of $PGE_2$was inserted. The maximum dose of PGE_2 allowed was 2 doses. If the bishop score was 6 or more, labour was induced with amniotomy and if uterine contractions were not established within 2 hours of amniotomy, labour was augmented with oxytocin. Indications for induction of labour, mode of delivery ,indications for caesarean section and any intrapartum and postpartum complications were noted. Retrospective data was collected using a predesigned data collection sheet of all women admitted for IOL. A P value < 0.05 was found and it was statistically significant. Data was analysed on SPSS version 17.

RESULTS

Out of the 90 patients 60 delivered by caesarean section and 30 by vaginal delivery. The average induction delivery interval was 19 hours. Most of the patients (50%) belonged to > 25 years of age group as shown in Table I. 54.4% of the patients were induced by PGE2 vaginal pessary, Table 2. Most common indication for induction of labour was found to be post dated pregnancy as shown in Figure I.

Indication of patients who were taken up for caesarean section following induction of labour, i.e., induction of labour was failed in the following cases as shown in figure II. Most of the patients were between 25 to 35 years of age (50%) and least number of patients were of 15 to 25 years age group (20%). Figure I shows the indications for induction of labour.

Figure 1: Most common indication was found to be post dated pregnancy



Indications for induction

Table 1: Age distribution of the patients (n= 90)

Age	n	%age
15 - 25 yrs	18	20
25 - 35 yrs	45	50
>35 yrs	27	30

Table 2: Method of Induction (n: 90)

Methods Of Induction	n	%age
Prostaglandin followed by oxytocin infusion and ARM	49	54.44
ARM followed by oxytocin infusion	41	44.5

The following factors were found to be associated with increased risk of failed induction: Bishop score < 5, Gestational age >41 weeks, extreme of ages, oligohydroamnios, prelabour rupture of membranes (PROM), hypertensive disorders of pregnancy, induction delivery time greater than 24 hours , meconium stained liquor, small for gestational age and macrosomic babies .(Table 3)

Table: 4 shows majority of patients 66(73%) were delivered with no intrapartum or post partum complications. Only 14(15.55%) developed abnormal uterine action, cervical tear in 4(4%), post partum haemorrhage in 4(4%) and blood transfusion was needed in only 4 (4%)of cases .

80(80%) babies were born healthy at birth. 16(16%) were born with birth asphyxia who needed resuscitation but there was no perinatal mortality.

Figure 2: The most common cause is failure to progress after 24 hours

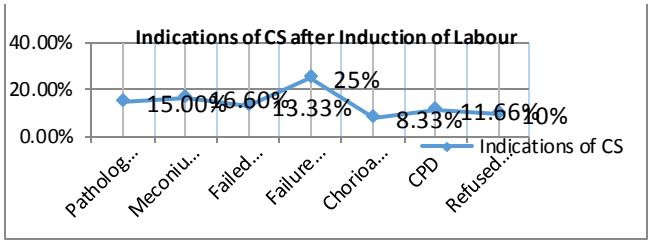


Table 3: P value and significance of various factors associated with failed induction of labour. Other observations and results of the study are as follows:

Factor	P value	Significance
Bishop's Score < 5	< 0.0001	Extremely Significant
Gestational Age > 41 weeks	< 0.01	Significant
Chorioamnionitis	< 0.01	Significant
Prelabour Rupture of Membrane	< 0.01	Significant
Induction Delivery interval Age > 24 hrs	< 0.0155	Statistically Significant
Meconium Stained Liquor	< 0.0001	Extremely Significant
Baby Weight (< 2 kg + > 3.5 kg)	< 0.0001	Extremely Significant

Other observations and results of the study are as follows :

Table 4: Maternal complications (Intrapartum / Postpartum) (n:90)

Maternal Complications	n	%age
Abnormal uterine action	14	15.5
Cervical Tear	4	4.4
Post Partum Haemorrhage	4	4.44
Manual removal of placenta	0	0
Blood Transfusion Reaction	2	2.22
No Complication	66	73.3

DISCUSSION

The study was aimed to study a clinical entity called "Failed Induction" in our clinical scenario. Lin and Rouse suggested a practical definition of failed induction IOL as the inability to achieve cervical dilatation > 4 cm after 12 ± 3hrs of oxytocin administration[9]. Nonetheless a successful vaginal delivery is still considered by many as the main

induction of labour outcome although it depends on many other factors interacting during labour and fetomaternal co morbidities which are not necessarily related to the induction process. The time interval between the second dose of PGE2 and the delivery time has not been quantified. Timely onset of labour and delivery is an important determinant of maternal and perinatal outcome.

Post term births are associated with higher rates of perinatal morbidity and mortality especially a risk of sudden death in utero than pregnancies delivered at term[10].The condition of cervix at the start of induction is an important predictor, with the modified bishop score being a widely used scoring system. Induction of labour results in higher failure if the cervix is not ripe[11-12]. It is consistent with our study as well where bishop score < 5 was also found significantly associated with failed IOL. The most important element of the bishop score is cervical dilatation[13-14]. In our study the induction delivery time was found to be 19 hours. In a study done by Michelson et al, women with failed induction were 3 times more at odd of having prolonged latent phase and 1.6 times more likely to have prolonged second stage[16]

Certain characteristics of the foetus predispose to induction failure. Higher birth weights have been found to increase the risk of failed induction and a lower rate of vaginal delivery[17]. This is consistent with our study results where we found both the SGA and LGA fetus to significantly increase the rate of caesarean section. Similar results were found by other investigations [13,19]. A significant number of study population were induced due to prolong rupture of membranes and hypertensive disorders of pregnancy. In these patients fetal distress and deterioration of maternal hypertensive disorders were the main contributing factors leading to increase caesarean section rate. Khan NB et al and Vahratian A[18] have also found consistent results in their studies.

Birth asphyxia and Foetal hypoxia (meconium staining) was 2% at 40 completed weeks, 6% at 41 completed weeks an 12% at 42 completed weeks in the study by Thegar 2002.[20] The data of our study also depicted gestational age > 41 weeks, oligohydramnios and meconium stained liquor, all the risks related to prolonged pregnancy, as the risks of failed induction and in increased caesarean section rate as well. The main limitation of the study was, ours being a retrospective study. But the result of this study gave valuable information on one of the most common interpretation in the obstetric practice which is linked to maternal and perinatal morbidities and mortalities and the rate of caesarean section deliveries.

CONCLUSION

The fetal distress and the abnormal uterine action were the main causes of failure of induction of labor.

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