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FETOMATERNAL OUTCOME IN SPONTANEOUS VERSUS INDUCED LABOR

Obstetrics & Gynaecology

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ABSTRACT

Background and Objectives: The medical induction of labour at term gestation has always been controversial and is based on conflicting evidences.The present study is an attempt to assess the feto-maternal outcome of induced labour compared to spontaneous onset labour. **Type of study:** It was a prospective comparative study conducted at a tertiary care hospital, Lalla Ded Hospital Srinagar. **Materials and methods:** A total of 200 patients participated in this study. 100 women who had indicated induction of labour (study group) were compared with 100 women with spontaneous onset labour in active phase with cervix atleast 4 cm dilated (control group). **Results:** Vaginal delivery was 66% in the study group compared to 88% in the control group. Induced labour was associated with a significantly higher caesarean section rates (P< 0.001). Maternal complications include primary postpartum haemorrhage, perineal lacerations and puerperal pyrexia. The study group had longer duration of hospital stay compared to the control (P <0.001).The neonatal Apgar scores at 1 and 5 min were comparable between both groups and showed no statistically significant difference. **Conclusion:** Induction of labour is associated with increased risk of caesarean delivery.

KEYWORDS

Induced labour; maternal complications; neonatal outcome; spontaneous labour.

INTRODUCTION:

Induction of labor is artificial initiation of contractions in a pregnant woman who is not in labor to help her achieve a vaginal birth within 24 to 48 hour. Induction of labour is one of the most common and important obstetric interventions. Induction of labour should be performed only when there is a clear medical indication and/or obstetric indication for it and the expected benefits outweigh its potential harms.[1]

The rate of induction is on the rise,[2]with an increasing number of obstetricians and their patients choosing to electively induce labor.Recent data indicate a percentage of induction of up to 35.5% in Sri Lanka[3], 24.5% in the United States[4] ,and from 6.8 to 33% in Europe[5].

Accepted absolute indications of induction of labor are hypertensive disorder(preeclampsia or eclampsia),maternal medical condition (diabetes mellitus, renal disease, chronic pulmonary disease), fetal compromise(fetal growth restriction, isoimmunisation, non reassuring antepartum testing, oligohydramnios), prelabor fetal rupture of membranes, demise, chorioamnionitis, prolonged pregnancy(>42 weeks)

Although the literature on elective induction is limited, advantages and disadvantages have been described.[6] Opinions differ regarding the risk to mother and fetus during elective induction of labor.[7]While some studies suggest that induction of labour increases the risk of complications such as postpartum haemorrhage (PPH), caesarean section on account of foetal distress, instrumental vaginal delivery, blood transfusion, longer hospital stay, need for immediate care of the newborn and admission to neonatal intensive care unit (NICU).[8]However, some of these perinatal results may be related to the very pathological conditions that led to an indication for induction of labour rather than the induction of labour process itself.[9]

AIMS AND OBJECTIVES:

To assess the feto-maternal outcome of induced labour compared to spontaneous onset labour in a tertiary maternity unit.

MATERIALS AND METHODS:

This was a prospective comparative study conducted in the Lalla Ded Hospital Srinagar, which is an affiliate of Government Medical College Srinagar. Informed consent was also obtained from each patient prior to inclusion.

A total of 200 patients participated in this study. 100 women who had indicated induction of labour (study group) were compared with 100 women with spontaneous onset labour in active phase with cervix atleast 4 cm dilated (control group)

Inclusion Criteria :

Live singleton pregnancy,vertex presentation

Exclusion Criteria:

Previous casearean section,malpresentation,multiple pregnancy, contracted pelvis, abnormal placentation, fetal death, cord prolapse, severe oligohydraminos, non reassuring fetal heart status,gestational age less than 37 weeks.

An Informed written consent was obtained from each patient who fulfilled inclusion & exclusion criteria. Selected patients were evaluated by history, physical examination, systemic examination & internal examination. Routine investigations were sent. Ethical clearance was taken from the hospital.

To obtain socio-demographic information of the participants, gestational age at delivery, parity and booking status a structured proforma was used.

Labour progress was monitored on the partograph. The method of the induction depended on the Bishop's score. If Bishop's score was unfavorable, “Dinoprostone” gel(0.5 mg) was used for cervical ripening every 6 to 8 h not to exceed 3 doses in 24 hours in all the cases except in cases of prelabor rupture of membranes, where tablet “Misoprostol” 25 mcg every 6 h orally to a maximum of 5 doses was used. The patients who had favorable cervix (Bishop's score >7) were induced with “Oxytocin” infusion only. The patients who did not respond to the above protocol over 48 h or those showing signs of fetal compromise or labor dystocia on partographic monitoring were taken up for cesarean delivery.

Data obtained was analyzed using SPSS version 20(Statistical Package for Social Science, Inc. Chicago III). Descriptive and inferential statistics were applied in the course of analysis. Proportions and percentages were calculated for categorical variables. Pearson's Chi-square test and student's t-test (a non-parametric inferential statistical procedure) were used to assess relationships and statistical significance between categorical variables. P < 0.05 was considered to be statistically significant at 95% confidence interval.

RESULTS:

Table-1 Age characteristics of two comparison groups

Characteristics	Induced group(n)	Spontaneous group(n)	P value
Age(in years)			
< 25	8	7	
26 to 30	37	42	
31 to 35	43	35	
>35	12	16	
Mean±sd	29.30±4.03	28.76±4.38	0.36

The mean age of the participants was 29.72± 4.03 years for the study group and 29.81± 4.38 years for the control group, with no statistically significant difference.

Table-2 Obstetric history of two comparison groups.

	Induced group (%)	Spontaneous group(%)
Primigravida	66	59
Second gravida	18	20
Third gravida	8	11
Fourth gravida	8	10

Nulliparous women accounted for 66% and 59% in the study and control groups, respectively.

Table-3 Outcome comparison for mode of delivery

	Induced group n (%)	Spontaneous group n(%)	P(X^2)
Mode of delivery			
Vaginal delivery	66(66%)	87(87%)	<0.001
Casearean delivery	34(34%)	13(13%)	

Vaginal delivery in the study group was 66% compared to 87% in the control group, giving a caesarean section rate of 34 %and 13 % in both the groups, respectively.This was found to be statistically significant ($\chi 2\,(1) = 12$, $P < 0.001$).

Table-4 Outcome comparison for indications of casearean section

Indication of casearean section	Induced group n(%)	Spontaneous group n(%)
Fetal distress	20(58.82%)	5(38.86%)
Failure of induction	7(20.58%)	_
Non progression of labor	4(11.76%)	4(30.76%)
Cephalo pelvic disproportion	2(5.88%)	4(30.76%)
Failed instrumental delivery	1(2.94%)	_

Fetal distress was the most common indication for caesarean section in both groups at 58.82% in the study compared to 38.86% in the control.

Table -5 Maternal complications of two comparison groups

	Induced group n(%)	Spontaneous group n(%)
Maternal complications		
Postpartum hemorrhage	5(33.33%)	2(25%)
Puerperal pyrexia	3(20%)	1(12.5%)
Lacerations excluding episiotomy	7(46.66%)	5(62.5%)

Notable maternal complications of no statistical significance include primary postpartum haemorrhage 5(5%) in the study versus 2 (2%) in the control group, second-degree perineal lacerations 7% in the study versus 5% in the control and puerperal pyrexia (3 in the study versus 1 in the control group).However, postpartum haemorrhage was noted in 5 (5%) participants of the study group, with 1 requiring blood transfusion compared with 2 (2%) from the control group.There was no maternal death recorded among the women studied.

Table -6 Duration of labor and hospital stay among comparison groups

	Induced group n(%)	Spontaneous group n(%)	P (t-test)
	Mean±S/D	Mean±S/D	
Duration of labor (hours)	6.9±2.25	6.7±3.3	0.61
Duration of hospital stay(days)	3.1±2.5	2.1±1.5	0.0007

There was no statistically significant difference between mean induction to delivery time (6.9±2.25 h) compared to the duration of active phase of labour in the control group (6.7±3.3), P = 0.61

The study group had significantly longer duration of hospital stay 3.1±2.5 days compared to the control 2.1±1.5 days (P < 0.001). For those who had caesarean section, the mean duration of stay was 7 ± 4 days for either group.

Table-7 Neonatal outcomes among comparison groups

	Induced group n(%)	Spontaneous group n(%)	P(t-test)
	Mean ±S/D	Mean ±S/D	
Apgar score@1minute	6.33±1.46	6.55±1.45	0.28
Apgar score@5 minute	8.44±1.28	8.5±1.37	0.74
Mean birth weight (kgs)	3.5±0.82	3.3±0.7	0.06

The mean birth weight and neonatal apgar scores at 1 and 5 min were comparable between both groups and showed no statistically significant difference.

Table-8 Neonatal outcomes among comparison groups

	Induced group n(%)	Spontaneous group n(%)	P(X^2)
NICU admission			
Yes	11%	7%	0.32
No	89%	93%	
Indication for induction			
Meconium aspiration	5(45.45%)	3(42.85%)	
Birth asphyxia	4(36.36%)	3(42.85%)	
Presumed sepsis	2(18.18%)	1(14.28%)	
Eventual neonatal outcome			
Alive	8(72.72%)	5(71.42%)	0.9
Dead	3(27.27%)	2(28.57%)	

Neonatal intensive care unit (NICU) admission was required for 11 % of the babies in the study group compared to 7% in the control group (P = 0.32). These consist of meconium aspiration (5 versus 3),birth asphyxia (4 versus 3), and presumed sepsis (2 versus 1) in the study and control groups.

The mean duration of admission of babies in NICU was 7.0 ± 3 days. Seven babies in the study group compared to 3 in control were admitted for 1–3 days in NICU, whereas 4 babies were admitted for >3 days in both study and control groups.

There were 5 neonatal deaths, 3 in the study group and 2 in the control group. Birth asphyxia was the cause of death in 2 babies delivered in the control group compared to 1 in the study group. Neonatal sepsis accounted for the remaining 2 deaths in the study group.

DISCUSSION:

It was noted that the induction exposes women to a higher risk of caesarian section than spontaneous labour.[10]In this study, induced labour was associated with a higher caesarean rate (34%) compared to 13% in those who had spontaneous onset labour. This finding is consistent with other studies.[11],[12],[13]

Caesarean section rate in this study was observed to be higher in nulliparous women compared to multiparous women in both the induced and spontaneous labour groups.

The successful vaginal delivery rate in those induced was 66% compared to 87% in those with spontaneous labour. This difference was statistically significant, which is in agreement with those documented in the literature.[14]

Postpartum haemorrhage complicated more of the induced labour (5%) than spontaneous labour cases 2%, however, this was not statistically significant.It was noted that longer hospital stay was seen in induction group.This was similar to finding in other studies.[15],[16]

The neonatal apgar scores at 1 and 5 min were comparable between both groups and showed no statistically significant difference.

CONCLUSION:

Induction of labour is associated with increased risk of caesarean delivery.

The neonatal Apgar scores at 1 and 5 min were comparable between both groups and showed no statistically significant difference. Wherever induction of labour is carried out, facilities should be

available for assessing maternal and fetal well-being.

Wherever possible, induction of labour should be carried out in facilities where caesarean sections can be performed.

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