

A Hospital Based Study to Assess the Influence the Risk of Emergency Cesarean Delivery in Induced Labors at Term

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Abstract

Aim: The aim of this study was to identify those factors which influence the risk of emergency cesarean delivery in induced labors at term.

Material & Methods: A year-long case-control research was done in Obstetrics & Gynaecology. Out of 350 women evaluated, 150 had emergency caesarean sections and 200 had vaginal deliveries. All mothers with a live cephalic fetus induced at term (C37 weeks) were included. In the cohort, cases were emergency caesarean section deliveries and controls were vaginal deliveries. All patients gave informed permission.

Results: We estimate all comparisons as OR with 95% CI using logistic regression. We examined cesarean delivery factors. We found that cesarean delivery was linked with mother age 35, BMI 30 kg/m², nulliparity, preinduction Bishops score < 5, prenatal diabetes mellitus, and intrauterine growth restriction. Epidural analgesia, gestational hypertension, postterm pregnancy, and early rupture of membranes did not promote cesarean delivery in induced term labor.

Conclusion: Mother and child benefit most from vaginal birth. Instead of inducing patients at term, elective cesarean section is preferable for people with numerous risk concerns. Women with various risk factors for caesarean might have an elective section instead of induction.

Keywords: Induction of labor; Cesarean section; Term pregnancy; Risk factor.

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Introduction

Hippocrates described labor induction via breast stimulation and cervical canal dilatation. [1] Induction is encouraging contractions before labor begins, with or without torn membranes. The encouragement of insufficient spontaneous contractions is called augmentation. Induction is recommended when mother or fetal advantages exceed staying pregnant. All age, racial, and ethnic groups have more cesarean deliveries. The introduction of evidence-based recommendations favoring cesarean delivery for breech presentations and concerns about the safety of a trial of labor for women with a previous cesarean have led to this trend. [2] Increased labor induction and obesity, diabetes, and hypertension among childbearing women may also contribute. [3-6] The growth in primary cesarean delivery was not linked to maternal health hazards in birth certificate studies. [7,8] Cesarean delivery improves outcomes for women and infants with medical grounds, although the mother's health concerns must be considered. Hysterectomy, postpartum hemorrhage, venous thromboembolism, wound complications, and hospital readmission appear to be increased. [9,10]

Multiparous women's cesarean birth following induction of labor variables are unknown. Cesarean deliveries raise hazards for future pregnancies as well as the index pregnancy. [11] WHO advocates non-clinical efforts to avoid needless CS delivery and IOL operation only when it is better to terminate the pregnancy than let it proceed. [12] As the main purpose of IOL is to assist the mother initiate labor and deliver vaginally, it may fail and require CS. [13,14] CS includes delivering a baby via a mother's abdominal and uterine incision. [15,16] Over the previous few decades, CS has increased 32.8% worldwide. [17]

CS has more complications than vaginal birth, including greater surgical expenditures, shorter recovery, increased chance of adverse events in subsequent pregnancies, infections, organ damage, blood transfusions, and death. [18-20] Labor induction increases emergency cesarean birth risk. Decisions to induce deliveries in less urgent situations are complex. Induction fails, an emergency cesarean delivery is undertaken, which has higher maternal risks than elective cesarean deliveries.

This study sought to identify term-induced pregnancies with a higher risk of cesarean delivery.

Material & Methods

A year-long case-control research was done in Department of Obstetrics and Gynecology, ICARE Institute of Medical Science and Research & Dr BC Roy Hospital, Haldia, West Bengal, India for one year. Out of 350 women evaluated, 150 had emergency caesarean sections and 200 had vaginal deliveries. All mothers with a live cephalic fetus induced at term (C37 weeks) were included. In the cohort, cases were emergency caesarean section deliveries and controls were vaginal deliveries. All patients gave informed permission. The research enrolled all participants after they signed written informed permission.

Exclusion Criteria: The exclusion criteria include previous cesarean section, uterine scar (myomectomy), multifetal gestation,

malpresentation, and where vaginal delivery was otherwise contraindicated.

Information of women induced was obtained from case records and antenatal cards. All women enrolled were examined prior to induction and induced using Dinoprostone gel (0.5 mg) intracervically (doses may be repeated after 6 h, with a maximum of two doses in 24 h) and if required, labor was augmented using oxytocin (starting dose of 6 mU/min, with 6 mU/min increase every 40 min, but employs flexible dosing based on uterine response).

Statistical Analysis: The data were modeled through multiple logistic regressions, and adjustments were made for independent variables that had a significant influence on the risk of cesarean delivery in the univariate analysis. The data analysis was performed using IBM SPSS Statistics version 20 software.

Results

Table 1: Analysis of risk factors for cesarean delivery

Risk factors	Cesarean delivery (N = 150) N%	Vaginal delivery (N = 200) N%	Crude odds ratio (95 % CI)
Maternal age			
<35 years	135 (90)	196 (98)	7.345 (1.586–34.367)
>35 years	15 (10)	4 (2)	
Body mass index (Kg/M ²)			
<30	105 (70)	190 (95)	5.80 (2.934–11.996)
>30	45 (30)	10 (5)	
Parity			
Nullipara (0)	135 (90)	124 (62)	0.175 (0.092–0.355)
Multipara (C1)	15 (10)	76 (28)	
Bishops score			
<5	48 (32)	106 (53)	0.4245 (0.2559–0.6879)
>5	102 (68)	94 (47)	
Epidural analgesia			
No	45 (30)	64 (32)	1.1570 (0.6908–1.9360)
Yes	105 (70)	136 (68)	
Hypertensive disorders in pregnancy			
Yes	40 (26.66)	60 (30)	0.8589 (0.5032–1.4453)
No	110 (73.34)	140 (70)	
Gestational diabetes mellitus			
Yes	33 (22)	40 (20)	1.9830 (1.0587–3.7244)
No	117 (78)	160 (80)	
Postterm pregnancy			
Yes	45 (30)	60 (30)	1.0335 (0.6177–1.7411)
No	105 (70)	140 (70)	
IUGR			
Yes	2 (1.34)	20 (10)	0.0813 (0.0108–0.6402)
No	148 (93.34)	180 (90)	
PROM			
Yes	30 (20)	24 (12)	1.3889 (0.7389–2.6019)
No	120 (80)	176 (88)	

Using logistic regression analysis, all comparisons are estimated and expressed as OR with 95 % CI. Factors associated with cesarean delivery were analysed. Our study had shown that maternal age ≥ 35 years, BMI ≥ 30 kg/m², nulliparity, preinduction Bishops score less than 5, gestational diabetes mellitus, and intrauterine growth

restriction are significantly associated with caesarean delivery. The presence of epidural analgesia, gestational hypertension, postterm pregnancy, and premature rupture of membranes was not associated with significant increase in cesarean delivery if labor was induced at term.

Table 2: Multivariate analysis of risk factors for cesarean delivery

Risk factors	Adjusted odds ratio (95 % CI)	Sig.
Maternal age	8.532	0.003
Body mass index	28.448	0.000
Nulliparity	27.033	0.000
Bishops score	12.058	0.001
Epidural analgesia	0.312	0.536
Hypertensive disorders in pregnancy	0.386	0.542
Gestational diabetes mellitus	4.642	0.034
Postterm pregnancy	0.014	0.846
IUGR	9.012	0.003
PROM	1.048	0.344

Multivariate analysis showed statistically significance in terms of maternal age, BMI, nulliparity, Bishops score, gestational DM and IUGR.

Discussion

The practice of inducing labor has been around since Hippocrates first described it, using techniques like mechanical dilation of the cervical canal and stimulation of the mammary glands. [21] Induction refers to the process of triggering contractions prior to the natural beginning of labor, whether or not the membranes have ruptured. Stimulating insufficient spontaneous contractions is known as augmentation. When the consequences of carrying the pregnancy to term exceed the advantages to the mother or the unborn child, the decision to induce labor is made. Postterm pregnancy, intrauterine growth restriction, gestational hypertension, premature membrane rupture, a non-reassuring fetal status, and a number of maternal medical conditions, including diabetes and chronic hypertension, are common causes. The likelihood of a cesarean section following an induction of labor was higher for women who had a history of preterm births compared to those who had given birth at least once at term. This result is in line with what Park et al. found. [22] He looked at how well a woman's obstetric history, Bishop score, and sonographic cervical length measurement predicted a failed induction of labor in term-pregnant women. Two women had caesarean sections (1.8% of the total) and thirteen gave birth vaginally within 24 hours after the induction failed (14% of the total). We confirm Park's findings that women who have a history of preterm deliveries have an induction process that is different from women who have a history of full-term deliveries.

Using logistic regression analysis, all comparisons are estimated and expressed as OR with 95 % CI. Factors associated with cesarean delivery were analysed. Our study had shown that maternal age ≥ 35 years, BMI ≥ 30 kg/m², nulliparity, preinduction Bishops score less than 5, gestational diabetes mellitus, and intrauterine growth restriction are significantly associated with caesarean delivery. The presence of epidural analgesia, gestational hypertension, postterm pregnancy, and premature rupture of membranes was not associated with significant increase in cesarean delivery if labor was induced at term. Poobalan et al [23] did a systematic review on the effect of BMI in nulliparous women on mode of delivery. They concluded that cesarean delivery risk is increased by 50 % in overweight women (BMI 25–30 kg/m²), and is more than double for obese women (BMI 30–35 kg/m²) compared with women with normal BMI (20–25 kg/m²). Study by Sheiner et al [24] and Ehrenberg et al [25] also showed significant association between obesity and caesarean delivery even after the exclusion of hypertensive disorders and diabetes mellitus. Our study also has shown significant association between high BMI (>30 kg/m²) and cesarean delivery.

As far as role of preinduction Bishops score is concerned, our study has showed significant association between low preinduction Bishops score (<5) and caesarean delivery. Similar results were seen in study by Johnson et al. [26] Study by Ehrenberg et al [25] and Rosenberg et al [27] has shown significant association between cesarean delivery and pregestational as well as gestational diabetes mellitus. Our study has concluded the same results. The increased risk of CS on high birth weight infants may be explained by the high risk of

labor obstruction that may be caused by shoulder dystocia which happens when the baby's anterior shoulder gets caught above the mother's pubic bone, leading to complications including brachial plexus injury or clavicle fracture, vaginal tears, and excessive bleeding. This obstruction eventually led to failure in vaginal delivery and hence, necessitates emergency CS delivery. [28]

In our study, postterm pregnancy is not significantly associated with cesarean delivery. Similar results were seen in a study by Sanchez-Ramos et al. [29] They recommended that labor induction at 41-weeks' gestation for otherwise an uncomplicated singleton pregnancy reduces cesarean delivery rates without compromising perinatal outcomes. Our study has shown that IUGR and cesarean deliveries are significantly associated. However, K E Boers and associates [30] have shown that there is no increase in operative and instrumental delivery rates in induced labors in pregnancies complicated by IUGR. In our study, pregnancies with PROM and induction of labor were not significantly associated with cesarean deliveries. Induction of labor in such cases reduces risk of maternal infections. Systematic review by Dare et al [31] concluded the same results.

Conclusion

The healthiest option for mom and baby is a vaginal birth. Elective caesarean sections are preferable to initiating labor at term for patients with numerous risk factors. Elective caesarean sections are an alternative to initiating labor at term for women who have certain risk factors for the procedure.

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