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ORIGINAL ARTICLE

Maternal and Neonatal Outcomes of Caesarean Delivery on Maternal Request Versus Vaginal Delivery

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Abstract

Background: ***The prevailing opinion regarding CS indications has been altered in numerous countries due to advancements in scientific knowledge and societal, cultural, and legal transformations.***

Aim and objectives: ***To compare neonatal & maternal outcomes among females who underwent cesarean delivery on their requests versus women who delivered vaginally.***

Patients and methods: ***This case-control study involved two hundred pregnant women with a single pregnancy and delivered at term (among ≥ thirty-seven weeks' and ≤ forty-two weeks' gestation) at Al-Hussein University Hospital from November 2022 to April 2023.***

Results: ***There was statistically significant higher post-partum hemorrhage in vaginal delivery than cesarean delivery on maternal request p-value= 0.017. However, no statistically significant difference among cesarean delivery on maternal request vs. vaginal delivery as regards the need for a blood transfusion, need for ICU admission, chorioamnionitis, and local wound infection p= (0.097, 0.561, 0.316, 0.313) respectively. There was a statistically significant worsening of respiratory issues (respiratory distress due to transient tachypnea of newborn) p-value = 0.045 and higher breast-feeding delay in cesarean delivery on maternal request than vaginal delivery p<0.0001.***

Conclusion: ***When compared to vaginal births, cesarean sections doubled the rate of transfer to the neonatal ICU & the risk of pulmonary problems. Postpartum hemorrhage and difficulties with nursing were among the maternal complications that were more common after cesarean sections.***

Keywords: Maternal and neonatal outcomes; caesarean delivery; vaginal delivery

1. Introduction

Because of developments in science and societal, cultural, and legal norms, there has been a shift in the general agreement over the signs for CS in many nations. Medically necessary CS indications are no longer the only ones; psychological causes, including labor anxiety and CS at the mother's request (CSMR), are also valid.[1]

The WHO recommends a rate of fifteen to twenty percent for cesarean sections. However, the actual rate is thirty percent, up from eleven percent in 1980.[2]

The desire for cesarean sections by mothers is a contributing factor to the rising rate of these deliveries. To avoid giving birth vaginally, CSMR is defined by the American College of Obstetricians & Gynecologists (ACOG) as an elective cesarean section performed in the lack of a standard medical or obstetrical indication.[3]

Medical research has shown that abdominal deliveries are associated with increased rates of mother & newborn morbidity compared to vaginal deliveries. Maternal morbidity from infections (0.6 percent vs. 0.2percent), thromboembolic injuries (0.06 percent vs. 0.03 percent), & anesthetic complications (0.5percent vs. 0.2percent) could be considered, even though the risk of hemorrhages and chorioamnionitis is lower with cesarean delivery than with vaginal delivery (0.02% vs 0.07 percent &0.01 percent, respectively).[4, 5]

The following complications should be highlighted: uterine rupture, infertility, and placental abnormalities (including placenta previa, increta, or accreta) that can occur in subsequent pregnancies. There is a direct correlation between the types of incisions (ranging from 0.7 percent to nine percent), and the estimated global incidence of uterine rupture is one percent. [6,7]

This research set out to examine the results for mothers & newborns of two groups: those who gave birth vaginally & those who had cesarean sections at the mother's desire.

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2. Patients and methods

This case-control study involved two hundred pregnant women with a single pregnancy. It was delivered at term (between≥ thirty-seven weeks' and ≤ forty-two weeks' gestation) at Al-Hussein University Hospital from November 2022 to April 2023.

2.1.Sample size:

This research is based on work done by Bodner et al. The sample size was determined using Epi Info STATCALC, considering the following assumptions: An eighty percent power and a ninety-five percent two-sided confidence level. A five percent margin of error. From the Epi-Info output, 193 was the maximum sample size used. This led to an increase in the sample size to 200 participants to account for potential dropout cases during the follow-up.[8]

Patients were divided by 1:1 ratio into Group 1: 100 women who underwent cesarean delivery on their request without any medical or obstetric indications for CS, and Group 2: 100 patients who underwent vaginal delivery.

$$\left(\frac{Z_{a/2} + Z_B}{P_1 - P_2}\right)^2 (p_1q_1 + p_2q_2)$$

Takazawa & Morita [9]

n = sample size

Z a/2 (The critical value that divides the central 95% of the Z distribution)

ZB (The critical value that divides the central 20% of the Z distribution)

p1 = prevalence in case group

p2 = prevalence in the control group.

q = 1-p

2.2.Inclusion criteria: Women agreed to be included in the study, females aged eighteen to thirty-five years, women with a singleton pregnancy, cephalic presentation pregnancy, women with BMI < 35, hemoglobin ≥ 10 g/dl, women presenting at term (among ≥ thirty-seven weeks' & ≤ forty-two weeks'), and low-risk pregnancies.

2.3.Exclusion criteria: Women disagreed with being included in the study, women older than 35 years, women with twin gestation or non-cephalic presentation, women with BMI > 35, hemoglobin < 10, preterm delivery (before 37 weeks gestation), pregnancies with medical or prelabour indications for cesarean delivery and High-risk pregnancies.

2.4.Methods

All patients were subjected to the following:

Complete history taking

Personal history, complaint its duration, Present history: Analysis of the current patient complaint, history of sensitivity to drugs, Past medical history: To determine each problem, when it started, the treatment required and whether there is any ongoing follow-up, Past surgical history: History of previous operations especially previous CS deliveries, Menstrual history: First day of last menstrual cycle, obstetric history including the patient's total number of births, any complications during pregnancy, including terminations, ectopic pregnancies, stillbirths, & miscarriages. Term Pregnancies: The following questions should be asked for any prior pregnancy that lasted longer than 28 weeks: During the gestational period, The risk of complications such as gestational hypertension, gestational diabetes, pre-eclampsia, obstetric anal sphincter injury (3rd, 4th-degree tears), postpartum hemorrhage, & the mode of delivery (voluntary vaginal, assisted vaginal, or Caesarean) are all factors to consider.

2.5.Physical examinations

Abdominal obstetric examination:

Fundal level of the uterus Scars of previous laparotomies.

Vaginal examination: Digital: masses in vagina or vaginal septum, fullness of posterior fornix, cervical assessment including dilatation, effacement, position, and consistency.

2.6.Pelvic examination: To assess uterine size and to identify any exclusion criteria.

2.7.Investigational Studies

Routine laboratory investigations: ABO RH and CBC, erythrocyte sedimentation rate & CRB, kidney & liver functions & PT, PTT, and INR.

2.8.Abdominal ultrasound examination: To assess estimated fetal weight, fetal movement, fetal heart sounds, and gestational age.

2.9.Anesthesia: The first group of patients who delivered by CS on their request underwent spinal anesthesia, while the second group of patients who delivered vaginally underwent local anesthesia for episiotomy and its repair

2.10.Outcome Measurements and Follow-up

Primary outcomes

Maternal: PPH, Need for blood transfusion, ICU admission, and Chorioamnionitis. Neonatal: Respiratory, neurological and traumatic injuries

Secondary outcomes:

Maternal: Maternal length of stay, wound infection. Neonatal: Normal lactation and neonatal jaundice

2.11.Ethical consideration

All information gathered from the participants is kept private. No publication or paper about this study ever mentioned the subjects by name. All participants were informed of the study's goals, methodology, and risk-benefit analysis prior to their enrollment. A waiver of liability was signed. Before they were enrolled in the study, all of the participants gave their informed consent.

3. Results

This table showed no statistically significant difference between caesarean delivery on maternal request versus vaginal delivery as regard maternal age, BMI and vital data p>0.05 at all parameters. (Table 1)

Table 1. comparison of maternal clinical data of the studied population

	NVD (N=100)			CS (N=100)			INDEPENDENT STUDENT T TEST	
	Mean	±	SD	Mean	±	SD	t	p-value
AGE YEAR	24.52	±	2.33	24.70	±	2.54	-0.522	0.602
BMI	25.09	±	2.74	25.10	±	2.49	-0.02	0.984
HR BEAT/MIN	78.96	±	6.00	78.54	±	5.36	0.522	0.602
RR CYCLE/MIN	17.40	±	0.88	17.44	±	0.94	-0.312	0.755
TEMPERATURE	37.01	±	0.22	36.96	±	0.22	1.587	0.114
SBP MMHG	108.00	±	7.39	109.70	±	7.21	-1.648	0.101
DBP MMHG	70.50	±	4.05	71.30	±	4.24	-1.364	0.174

This table showed no statistically significant difference between caesarean delivery on maternal request versus vaginal delivery as regard maternal hematological and biochemical laboratory investigations pvalue >0.05. (Table 2)

Table 2. comparison of maternal laboratory data of the studied population

	NVD (N=100)			CS (N=100)			INDEPENDENT STUDENT T TEST	
	Mean	±	SD	Mean	±	SD	t	p-value
HB GM/DL	10.39	±	1.02	10.18	±	0.98	1.471	0.143
HCT	33.44	±	3.06	33.55	±	3.52	-0.244	0.807
WBCS $X10^3/MM^3$	6.77	±	0.65	6.63	±	0.59	1.637	0.103
PLAT $X10^6/MM_3$	298.58	±	27.30	301.12	±	20.07	-0.75	0.454
ALT IU	20.40	±	4.83	20.26	±	5.08	0.2	0.842
AST IU	27.22	±	5.05	27.52	±	5.65	-0.396	0.693
UREA MG/DL	25.48	±	3.16	25.35	±	2.40	0.313	0.755
CREATININE MG/DL	0.70	±	0.11	0.71	±	0.12	-0.579	0.563

This table showed no statistically significant difference between caesarean delivery on maternal request versus vaginal delivery as regard GA, birth weight, sex and APGAR score p>0.05. (Table 3)

Table 3. comparison of neonatal clinical data of the studied population

	NVD (N=100)			CS (N=100)			INDEPENDENT STUDENT T TEST/ CHI SQUARE TEST	
	Mean	±	SD	Mean	±	SD	t	p-value
GA WEEKS	38.82	±	0.94	38.78	±	0.86	0.315	0.753
BIRTH WEIGHT KG	3.24	±	0.24	3.24	±	0.13	0.11	0.912
APGAR AT 1 MIN	7.02	±	0.38	7.10	±	0.41	-1.431	0.154
APGAR AT 5 MIN	8.12	±	0.48	8.18	±	0.44	-0.929	0.354
SEX	N (%)			N (%)			X^2	p-value
MALE	45 (45%)			52 (52%)			0.981	0.322
FEMALE	55 (55%)			48 (48%)				

This table showed statistically significant higher post-partum hemorrhage in vaginal delivery than caesarean delivery on maternal request p-value= 0.017, however no statistically significant difference between caesarean delivery on maternal request versus vaginal delivery as regard as regard need blood transfusion, need ICU admission, chorioamnionitis and local wound infection p= (0.097, 0.561, 0.316, 0.313) respectively. (Table 4)

Table 4. comparison of maternal outcome of the studied population

		NVD (N=100)	CS (N=100)	CHI SQUARE TEST	
		N (%)	N (%)	X^2	p-value
POST-PARTUM HEMORRHAGE	Yes	10 (10%)	2 (2%)	5.674	0.017
	No	90 (90%)	98 (98%)		
NEED BLOOD TRANSFUSION	Yes	5 (5%)	1 (1%)	2.749	0.097
	No	95 (95%)	99 (99%)		
NEED ICU ADMISSION	Yes	2 (2%)	1 (1%)	0.338	0.561
	No	98 (98%)	99 (99%)		
CHORIOAMNIONITIS	Yes	1 (1%)	0 (0%)	1.005	0.316
	No	99 (99%)	100 (100%)		
LOCAL WOUND INFECTION	Yes	3 (3%)	1 (1%)	1.020	0.313
	No	97 (97%)	99 (99%)		

This table showed statistically significant lower length of hospital stay in vaginal delivery than caesarean delivery on maternal request p-value <0.0001. (Table 5)

Table 5. comparison of maternal hospital stay of the studied population

		NVD (N=100)	CS (N=100)	CHI SQUARE TEST t	p-value
HOSPITAL STAY (HOURS)	Range	10-29	22-39	-13.154	<0.0001
	Mean ± SD	19.46 ± 6.64	30.60 ± 5.25		

This table showed statistically significant higher respiratory complications (respiratory distress due to transient tachypnea of newborn) p-value =0.045and higher breast-feeding delay in caesarean delivery on maternal request than vaginal delivery p<0.0001 and higher cephalohematoma in vaginal delivery than breast feeding delay in caesarean delivery p=0.041, but there wasn't statistically significant variance as regards birth trauma, neonatal jaundice and neonatal sepsis p=(0.313, 0.788, 0.316).(Table 6)

Table 6. comparison of neonatal outcome of the studied population

		NVD (N=100) N (%)	CS (N=100) N (%)	CHI SQUARE TEST X^2	p-value
RESPIRATORY COMPLICATIONS	Yes	3 (3%)	10 (10%)	4.031	0.045
	No	97 (97%)	90 (90%)		
NEUROLOGICAL COMPLICATIONS	Yes	1 (1%)	0 (0%)	1.005	0.316
	No	99 (99%)	100 (100%)		
BIRTH TRAUMA	Yes	3 (3%)	1 (1%)	1.020	0.313
	No	97 (97%)	99 (99%)		
CEPHALOHEMATOMA	Yes	4 (4%)	0 (0%)	4.166	0.041
	No	96 (96%)	100 (100%)		
NEONATAL JAUNDICE	Yes	8 (8%)	7 (7%)	0.072	0.788
	No	92 (92%)	93 (93%)		
NEONATAL SEPSIS	Yes	1 (1%)	0 (0%)	1.005	0.316
	No	99 (99%)	100 (100%)		
BREAST FEEDING DELAY	Yes	19 (19%)	55 (55%)	27.799	<0.0001
	No	81 (81%)	45 (45%)		
RESPIRATORY COMPLICATIONS	Yes	5 (5%)	10 (10%)	1.802	0.179
	No	97 (95%)	90 (90%)		

4. Discussion

The rate of cesarean sections has been steadily increasing over the last several decades. The modern methods of identifying fetal distress, managing arrest disorders during labor, and managing breech presentations are associated with this increase. One other reason to have a cesarean section when asked: the concern of pelvic floor damage during vaginal delivery & its potential long-term consequences, such as incontinence (both urine & anal).[10]

The main results of this study were as follows:

Our results showed that there was no statistically significant variance among cesarean delivery on maternal request versus vaginal delivery as regards maternal age, BMI, and vital data.

Our results agree with Bodner et al., who found that there was no statistically significant variance among cesarean delivery on maternal request versus vaginal delivery as regards maternal age, BMI.[8]

According to our findings, there was no statistically significant variance among cesarean delivery on maternal request versus vaginal.

Delivery as regards maternal hematological and biochemical laboratory investigations.

Also, our results agree with those of Kim et al. The study revealed that there was no statistically significant variation in the pre-or post-operative serum hemoglobin level, rates of postpartum hemorrhage, hemoglobin level decline of ten percent or more, red blood cell transfusion, wound infection, endometritis.[11]

We found that there was no statistically significant variance among cesarean delivery on maternal request versus vaginal delivery as regard GA, birth weight, sex, and APGAR score.

Our results agreement with Bakhsha et al. Our research revealed that 92.5 percent of newborn Apgar scores in the first minute were more than seven, and 94.4 percent in the fifth minute. Apgar scores at one five minutes post-vaginal delivery after a cesarean section were not significantly different from one another (P>0.05).[12]

We found that there was statistically significant higher post-partum hemorrhage in vaginal delivery than cesarean delivery on maternal request however no statistically significant difference between cesarean delivery on maternal request versus vaginal delivery as regard need a blood transfusion, need ICU admission, chorioamnionitis, and local wound infection.

Our result disagreed with Liu et al. that the planned vaginal birth group had lower odds of complications, such as bleeding needing transfusion (p = 0.048) & uterine rupture (p = 0.005). However, overall, the planned cesarean group had a greater risk of most complications. Compared to planned vaginal deliveries, the risks of certain serious complications after giving birth, such as hemorrhage requiring a hysterectomy,

cardiac arrest, venous thromboembolism, & major infection, are substantially higher with cesarean deliveries. This level of serious illness requires extra care in the clinic.[4]

The findings demonstrated that there was statistically significantly lower length of hospital stay in vaginal delivery than cesarean delivery on maternal request.

Our result agreed with Bodner et al., who found that hospital admission was Extended in elective cesarean section (6.8 vs. 3.5 days, p = 0.0001).[8]

Our results demonstrated that there were statistically significant higher respiratory complications (respiratory distress due to transient tachypnea of newborn) & higher breast-feeding delay in cesarean delivery on maternal request than vaginal delivery and higher cephalohematoma in vaginal delivery than breastfeeding delay in cesarean delivery.

Our results are supported by Kolås et al. With a significant rise from 5.2 percent to 9.8 percent (P <.001), the transfer rates to the newborn ICU were higher in planned cesarean deliveries compared to planned vaginal deliveries. The likelihood of developing pulmonary problems, such as respiratory distress syndrome & transient tachypnea in newborns, increased from 0.8 percent to 1.6 percent (P =.01). Pulmonary problems were more common in the planned cesarean delivery group compared to the planned vaginal delivery group (P <.01). The likelihood of experiencing any of the neurological symptoms was not different.[13]

Also, our results align with Bodner et al.'s findings, who discovered a significantly high incidence of breastfeeding difficulties in the cesarean group (p = 0.002). I stayed in the hospital for 6.8 days instead of 3.5 days (p = 0.0001).[8]

4. Conclusion

In comparison to vaginal births, cesarean sections treble the risk of pulmonary problems & the rate of transfer to the newborn ICU. Problems with nursing and postpartum hemorrhage were amongst the increased maternal complications associated with cesarean sections. Women should receive adequate counseling regarding the elevated risk of these problems. Spinal anesthesia in CS increases the mother's hospital stay after delivery and causes respiratory problems in the neonates.

Disclosure

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Authorship

All authors have a substantial contribution to the article

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