

## ORIGINAL ARTICLE

# Impact of Mode of Delivery on the Neonatal and Maternal Outcomes: A Cross-Sectional Study

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## ABSTRACT

**Aim:** To assess the impact of mode of delivery on the neonatal and maternal outcomes

**Study design:** A cross-sectional study

**Place and Duration:** This study was conducted at BMC Liaquat University of Medical Health Sciences Jamshoro Pakistan from February 2020 to February 2021.

**Methodology:** The patients were divided into two groups and each group included 178 women. One group had undergone cesarean section and the other group had undergone normal vaginal delivery, and different maternal and neonatal outcomes were assessed including trauma, significant loss of blood, Apgar score, puerperal febrile morbidity, wound infection, and cord pH.

**Results:** The study observed a higher rate of puerperal febrile morbidity and wound infections present in C-section. Similarly, blood loss was also significant in C-sections. However, neonatal complications were low and non-significant between the two groups.

**Conclusion:** The study observed that increased maternal morbidity is associated with C-sections and women must be informed properly before making a choice of delivery.

**Keywords:** Women, vaginal delivery, C-sections, morbidity

## INTRODUCTION

The rate of cesarean delivery has been an uprising in recent decades due to effective breech presentation management, effective management during labor, and prompt fetal distress identification.<sup>1</sup> Similarly, the cesarean section also minimizes the fear of pelvic floor damage which is usually occurred during vaginal delivery and causes long-term sequelae such as anal and urinary incontinence which is why some women prefer choosing cesarean section over vaginal delivery.<sup>2</sup> It has been reported in a recent survey that 80% of cases chose Cesarean section because of the fear of damaging the pelvic floor. However, some other obstetricians still consider cesarean section as a major procedure of surgery that is associated with different levels of risks and can result in severe complications whereas, some obstetricians consider it as a safe, sound, and straight forward method of delivering a baby associated with less risk.<sup>3</sup> This opinion is also divided among the patients as well. Some women consider the experience of vaginal delivery as the most fulfilling experience of their life whereas other women consider it as the worst event of their lives.<sup>4</sup> There is very little data available on the maternal and neonatal outcomes, particularly mortality and morbidity rates comparing vaginal and cesarean delivery. This study is conducted to assess neonatal and maternal morbidity in the planned vaginal delivery and elective cesarean delivery among the obstetric population.

## METHODOLOGY

This study was conducted at BMC Liaquat University of Medical Health Sciences Jamshoro Pakistan from February 2020 to February 2021. The study included all the women

undergoing elective cesarean section for whom cesarean section was elected because of maternal request and breech presentation. However, the women who had repeat cesarean were not included in the study. The data regarding mode of delivery i.e. whether the vaginal delivery was spontaneous or assisted was recorded. Only those women were included who had single pregnancy with the cephalic presentation, a reactive admission cardiotocography, and had a gestational age of 37 weeks. In case of any major fetal anomaly, induced labor, nonvertex presentation with spontaneous labor, restriction of fetal growth, the preexistence of any maternal disease, or complications during pregnancy such as hypertension, gestational diabetes, and premature membrane rupture were excluded from the study. Informed consent was obtained from every patient, and the study was approved by the ethical review committee of the institute. The variables of interest were the maternal and neonatal outcomes. Perineal tears were also categorized into first second and third-degree tears. Apgar score and pH of the cord were used to identify the neonatal outcome. The factors of neonatal morbidity were defined by pH 7.1 of the umbilical arterial cord, early neonatal distress was determined by Apgar score <7 at 1 minute, persistent neonatal distress was determined by Apgar score less than 7 at 5 minutes and neonatal infections were diagnosed by neonatologist of the hospital. For statistical analysis, SPSS version 23 was used and a p-value less than 0.05 was considered significant.

## RESULTS

In the current study, the recorded gestational age, parity, and age are presented in Table number 1. The outcome of

planned vaginal delivery data is given in Table number 2. In this study, it was observed that a spontaneous vaginal delivery was achieved in 87.6% of patients in whom no severe perineal injury was observed, whereas 7.9% of women had observed cesarean section. The genital tract trauma is presented in Table number 3. The median operation time in the cesarean section group was 35 minutes which ranged from 20-70 minutes. Spinal anesthesia was given before C-sections to 86.5% of patients. Any kind of major intraoperative trauma was not recorded. It was observed that in 3.4% of patients, the delivery was difficult and a vacuum extractor was used. The mortality and morbidity rates were also compared between the groups. Details of the maternal data are given in Table number 4.

Table 1: Characteristics of patients

Characteristics	Vaginal delivery (N=178)	Cesarean section (N=178)
Age of mothers	29 (19–45)	29 (19–45)
Primiparous	82 (46.1%)	82 (46.1%)
Multiparous	96 (53.9%)	96 (53.9%)
Age of gestation in weeks	40 (37–42)	40 (37–42)

Table 2: Women outcomes with vaginal delivery

Variables	Outcomes
Delivery mode	
Vacuum	8 (4.5%)
Spontaneous labor	156 (87.6%)
Cesarean section	14 (7.9%)
Length of the first stage in minutes	374±195
Length of the second stage in minutes	44 ± 23
Stimulation by oxytocin	
No	52 (29.2%)
Yes	126 (70.8%)
Position of birth	
Other	24 (19.1%)
Supine	144 (80.9%)
Analgesia	
Epidural	10 (5.6%)
Medical	64 (36%)
No	104 (58.4%)
Manual removal of placenta	
Yes	8 (4.5%)
No	170 (95.5%)
Absence of Puerperal febrile morbidity	164 (92.1%)
Presence of Puerperal febrile morbidity	14 (7.9%)
Postpartum hemoglobin	11.2 ± 0.9 g/dL
Blood loss of mothers	
Less than 500 mL	168 (94.4%)
More than 500 mL	10 (5.6%)

Wound infections and puerperal febrile morbidity were statistically significant as the obtained p-values were 0.001. It was observed that blood transfusion needs were quite low and not significant between both groups. During the puerperal period, a significant increase in the use of iron supplementation was observed with a P-value of 0.002, antibiotics with a P-value of 0.0001, and medical analgesics with a P-value of 0.0001. Similarly, complications in breastfeeding were also observed in C-

sections. Similarly, the duration of hospital stay was also significantly prolonged. The data regarding the neonates are given in Table number 5, however, no significant difference was observed regarding the complications of neonates.

Table 3: Frequency and distribution of genital tract trauma

Trauma	Distribution (N=178)
Episiotomy	
Mediolateral	52 (29.2%)
None	136 (70.8%)
Perineal trauma location	
First degree	24 (13.5%)
Second degree	12 (6.7%)
Third-degree	0 (0%)
Other trauma location	
Labial trauma	30 (16.9%)
Vaginal trauma	8 (4.5%)

Table 4: Maternal outcomes between vaginal and cesarean sections

Maternal Outcomes	Vaginal delivery	C-Section	P-value
Iron supplementation	122 (68.5%)	146 (82.2%)	0.002
Antibiotics	18 (10.1%)	48 (27%)	0.0001
Analgesics	60 (33.7%)	168 (94.4%)	0.0001
Blood transfusions	0 (0%)	2 (1.1%)	<0.05
Postpartum Hemoglobin (g/dL)	11.2 ± 0.9	10.4 ± 1	<0.05
Blood loss <500 ml	10 (5.6%)	22 (12.4%)	0.03
Wound infection	2 (1.1%)	16 (9%)	0.0001
Breastfeeding problems	4 (2.2%)	18 (10.1%)	0.002
Puerperal febrile morbidity	14 (7.8%)	46 (25.8%)	0.0001

Table 5: Neonatal complications between the two groups

Complications	C-Section	Vaginal Delivery	P-Value
Neonatal infection	2 (1.1%)	3 (1.7%)	>0.05
Apgar score			>0.05
At 1 min <7	10 (5.6%)	8 (4.5%)	
At 5 min <7	3 (1.7%)	2 (1.1%)	
Infant birth length (cm)	50 ± 2	50 ± 2	>0.05
Infant head diameter (cm)	35 ± 1	35 ± 1	>0.05
Infant birth weight (g)	3150 ± 281	3445 ± 278	>0.05
pH of cord <7.1	3 (1.7%)	5 (2.8%)	>0.05

## DISCUSSION

The current world is opting for a cesarean section as the mode of delivery instead of the classical vaginal delivery, still, the process is associated with safety concerns for both mother and the baby.<sup>5</sup> This study was conducted to assess the neonatal and maternal morbidity associated with C-sections and compare them with the outcomes of vaginal delivery. Previous studies conducted on a similar topic suggest that the risk of wound infections and puerperal infections was increased in the C-section which ultimately enhances the usage of medicines and antibiotics, and is also associated with the prolonged hospital stay.<sup>6</sup> We observed in the current study that problem during breastfeeding was significantly more common in the time

after pregnancy. A lot of literature has addressed the issues related to C-sections and re-evaluated vaginal delivery. It has also been observed that complications are usually more commonly observed in C-section instead of vaginal delivery such as infections, fever, and higher volume of blood loss but maternal morbidity is reduced in the case of C-section. Similarly, febrile morbidity was also high in the case of C-sections.<sup>7</sup> It has also been observed that febrile morbidity was also higher in cases of C-sections. Similarly, wound infections were also common in C-sections. However, Allen et al., have reported that women having C-sections, commonly observe postpartum hemorrhage.<sup>8</sup> We also observed that C-section patients had longer hospital stays than vaginal delivery ones. One of the findings of the current study was also similar to the other studies which suggested that the breastfeeding rate was significantly lower in the case of C-sections. However, the study included a small sample size so we were not able to draw definitive conclusions regarding maternal and neonatal complications.

### CONCLUSION

The study observed that increased maternal morbidity is associated with C-sections and women must be informed properly before making a choice of delivery.

**Ethical approval:** The study was approved by the ethical review board of the institute.

**Conflict of interest:** None

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