

A Comparative Study of Maternal and Neonatal Outcome in Second Stage Cesarean Section versus First Stage

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Abstract

Aim: The aim of the present study was to compare the maternal and neonatal complications of caesarean delivery performed in the second stage compared with the first stage of labor.

Material & Methods: This was comparative cross-sectional study between first stage and second stage cesarean section done in Sri Devaraj URS Medical College, R.L. Jalappa Hospital and Research Centre, Tamaka, Kolar, Karnataka, India from May 2021 to May 2022. After taking exclusion and inclusion criteria into consideration, total of 80 cesarean sections were taken, out of which 30 underwent section in second stage and 50 in first stage.

Results: Majority were in the age group of 20-25 years 40% in group 1 and 46.44% in group 2. Primigravida formed the majority of study population 72% in group 1 and 80% in group 2. Most important indication for first stage cesarean section is failed induction 32%. Arrest of descent-malposition is the most common indication for second stage cesarean section 60%. Incidence of PPH was more in group 2, i.e., 15 out of 30 cases (50%) whereas in group 1 it was 4 out of 50 cases (8%) only. In neonatal outcome, we got the results stating that the most common neonatal outcome was respiratory distress with 50% in group II and group I with 20% only.

Conclusion: We observed from the study that majority were in 20-25 years range and most common indication for group I was fetal distress whereas for group II it was malposition. Most common maternal outcome was PPH and neonatal outcome was respiratory distress. The cesarean section in second stage labour was directly related to increase incidence of PPH, fetal distress and admission to NICU. When operative intervention in the second stage of labour is required, the options, risks, and benefits of vacuum, forceps, and Cesarean section must be considered.

Keywords: Caesarean delivery, Neonatal septicaemia, Fetal pillow.

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Introduction

Cesarean section is one of the most common surgeries associated with women. According to the recent data collected, it is observed that there were increased maternal and neonatal complications in

cesarean done in second stage labor than first stage. Cesarean section at full cervical dilatation with an impacted fetal head can be technically difficult and is associated with increased trauma to the lower uterine

segment and adjacent structures as well as increased hemorrhage and infection [1]. During the last three decades it appears that assisted vaginal delivery such as forceps and vacuum extraction, traditionally used for arrest of descent, have been replaced by C/S during the second stage of labor. [2,3]

Cesarean section (C/S) rates are increasing at present. [4] Numerous factors during parturition contribute to the decision to perform C/S, and these include maternal, fetal and placental pathology, fetal malpresentation and maternal wish. During the last three decades it appears that assisted vaginal delivery such as forceps and vacuum extraction, traditionally used for arrest of descent, have been replaced by C/S during the second stage of labor. [5,6] Full cervical dilatation is referred hereinafter as second stage of labor. Cesarean section nowadays is usually performed as an alternative to operative vaginal delivery. [6] Its impact on maternal and neonatal morbidity during the active phase of labor and especially after the achievement of full dilatation has gained interest during the last decade. Cesarean section during the second stage of labor with an engaged head is generally thought to carry higher maternal morbidity, usually resulting from tearing of the lower uterine segment, extension of the uterine incision and incision of the urinary bladder. Furthermore, the delay in the decision to perform an emergency cesarean section for reasons of fetal distress puts the fetus at increased risk of developing hypoxia, thus risking brain damage that leads to varying forms of disability in its life. [7]

In Medical colleges and teaching hospitals in India the overall rate of caesarean deliveries is 24.4%. [8] In a population based cross sectional study, the public, charitable and private sector hospitals had caesarean section rates of 20%, 38% 47% respectively. [9] Recent data suggest that caesarean delivery in labor, is associated

with increased maternal morbidity compared with caesarean delivery with no labor. [10] During the last three decades, it appears that assisted vaginal delivery such as forceps and vacuum extraction, traditionally used for arrest of descent, have been replaced by c/s during the second stage of labor. [11,12] One fourth of the primary caesarean sections are reported to be performed in the second stage of the labor and are more complicated compared to the ones performed in the first stage. [13,14]

The aim of the present study was to compare the maternal and neonatal complications of caesarean delivery performed in the second stage compared with the first stage of labor.

Materials and Methods

This was comparative cross sectional study between first stage and second stage cesarean section done in Sri Devaraj URS Medical College, R.L. Jalappa Hospital and Research Centre, Tamaka, Kolar, Karnataka, India from May 2021 to May 2022.. After taking exclusion and inclusion criteria into consideration, total of 80 cesarean sections were taken, out of which 30 underwent section in second stage and 50 in first stage. First stage cesarean section comprises of 50 patients, is put into GROUP I and second stage cesarean section which comprises of 30 patient is put in GROUP II.

Inclusion Criteria

- Singleton pregnancy
- Term pregnancy
- Vertex presentation

Exclusion Criteria

- Pregnancies with previous caesarean sections
- Foetal congenital anomalies
- Or significant maternal disease or pregnancy complications (such as hypertension, diabetes, intra-uterine growth restriction, ante-partum

haemorrhage and prelabour rupture of membranes)

Variables

Following were the variable taken into consideration in this study.

Table 1- comprises of distribution of age and parity between the two groups.

Table 2- comprises of the indications of cesarean section between the two groups

Table 3- comprises of incidence of post-operative complication between the two groups

Table 4- comprises of neonatal outcome between the two groups.

Data was collected according to the Performa made and patient was examined thoroughly.

The duration of surgery is measured and is defined as the time elapsed between skin incision and skin closure. Extension of primary uterine incision is defined as any uterine wall defect, either laterally into the uterine vasculature, or vertically into the cervix or a contractile uterus that required additional steps to repair. Uterine artery injury is defined as disruption of vessels that required placing a suture to achieve adequate hemostasis PPH is defined as estimated blood loss >1000ml. Post-partum endometritis refers to infection of decidua. It is defined as persistent postpartum temperature >38.5 degree cent

with malodorous vaginal discharge as well as possibility of uterine tenderness on bimanual examination and no other pelvic infection. Neonatal outcome indicators included birth weight (Gms), Apgar score of newborns at 5mins, fetal injury, septicemia, respiratory distress, admission to nicu and death. Patients were examined, and data collected as per proforma. Data was collected from parturition register and case records on demographics, relevant obstetric data, indications and the intrapartum complications associated with C/S. Mother and baby were followed till discharge. Any complications to the mother and baby which developed during their hospital stay were also noted.

Statistical Analysis:

These two groups were then compared in terms of maternal demographics, labor characteristics, maternal outcomes and neonatal outcomes. Numerical variables were compared between groups by calculating P-Value for each variable. P value <0.05 was considered statistically significant.

Results

Total of 80 patients were selected after inclusion and exclusion criteria. Out of which group I with first stage cesarean section were total of 50 pregnant females and group II of second stage cesarean section with 30 pregnant females.

Table 1: Distribution of age and parity among subjects underwent first and second stage cesarean section

Variables		Group I (50)		Group II (30)	
		No.	%	No.	%
Age (Years)	<19	6	12	1	3.33
	20-25	20	40	14	46.66
	26-30	18	36	12	40
	31-35	6	12	3	10
Parity	Primi	36	72	24	80
	Multi	14	28	6	20

Majority were in the age group of 20-25 years 40% in group 1 and 46.44% in group 2. Primigravida formed the majority of study population 72% in group 1 and 80% in group 2.

Table 2: Indications of cesarean section

Group I (50)			Group II (30)		
Indications	No.	%	Indications	No.	%
Fetal distress	15	30	Malposition	18	60
Failed induction	16	32	CPD	10	33.33
Failure to progress	11	22	Failed vacuum	2	6.66
Meconium-stained amniotic fluid	8	16			
Total	50	100		30	100

Most important indication for first stage cesarean section is failed induction 32%. Arrest of descent-malposition is the most common indication for second stage cesarean section 60%.

Table 3: Incidence of post-operative outcome

Variables	Group I		Group II		P value
	No.	%	No.	%	
PPH	4	8	15	50	P<0.001
Need for blood transfusion	8	16	10	33.33	P<0.001
Bladder and bowel injury	0	0	0	0	

Incidence of PPH was more in group 2, i.e., 15 out of 30 cases (50%) where as in group 1 it was 4 out of 50 cases (8%) only.

Table 4: Neonatal outcome

Variables	Group I		Group II		P value
	No.	%	No.	%	
5 mins APGAR <3	1	2	2	6.66	P<0.001
Respiratory distress	10	20	15	50	P<0.005
Need for resuscitation	6	12	10	33.33	P= 0.04

In neonatal outcome, we got the results stating that the most common neonatal outcome was respiratory distress with 50% in group II and group I with 20% only.

Discussion

Cesarean Section is the most commonly performed abdominal operation in women all over the world. [15] Recent data suggest that cesarean delivery in labour is associated with increased maternal morbidity compared with cesarean delivery with no labour. One fourth of the primary cesarean section is reported to be performed in the second stage of labour and is more complicated compared to the ones performed in the first stage. The second stage of labour is defined as the time elapsed from full dilatation of the cervix to expulsion of the fetus. More

importantly, the extension of time given to the second stage of labour has been shown to increase the overall rate of vaginal births without adversely affecting neonatal morbidity. However, maternal morbidities are increased and include operative vaginal delivery, anal sphincter tears, postpartum hemorrhage and emergency cesarean sections (C/S). [16]

Majority were in the age group of 20-25 years 40% in group 1 and 46.44% in group 2. Primigravida formed the majority of study population 72% in group 1 and 80% in group 2. Allen et al [17] had compared the maternal and neonatal morbidity of cesarean section in first and second stage of labour in retrospective study. The maternal morbidities can be due to the difficulty in handling the fetus impacted in maternal pelvis. The unfavorable neonatal

outcomes are probably due to prolonged labour which leads to hypoxia. Estimated blood loss, PPH and need for blood transfusion all were greater in second stage cesarean group. Incidence of PPH was more in group 2, i.e., 15 out of 30 cases (50%) whereas in group 1 it was 4 out of 50 cases (8%) only. Rabiou et al [18] found that women who had cesarean deliveries performed in second stage had longer operative time, greater blood loss, more cases of intraoperative trauma, primary PPH, blood transfusion, re look laparotomy, hysterectomy, post-partum pyrexia wound infection and a longer hospital stay.

During the surgery 2 cases who delivered by cesarean in second stage had uterine tear whereas none had bowel and bladder injury. There was no case of maternal mortality reported in either of the groups. There were no cases of neonatal deaths reported in first stage cesarean group. This indicates that cesarean performed during second stage of labour is associated with increased incidence of fetal distress, septicemia, admission to NICU and fetal death. The unfavorable neonatal outcomes are probably due to prolonged labour which leads to hypoxia. [19] Cesarean section increases the risk in subsequent pregnancies of uterine rupture, which can lead to fetal death or serious fetal hypoxic injury. Cesarean section also increases the risk of placenta previa, placental abruption, and invasive placental disease. Maternal risk from Cesarean section includes increase maternal mortality. [20] In women who deliver by Cesarean section, maternal mortality is 4-fold that of the maternal population that delivers vaginally. The woman is at increased anaesthetic risk, particularly due to aspiration, and risk of increased blood loss, infection, venous thromboembolism and surgical injury to bladder and bowel.

When operative intervention in the second stage of labour is required, the options, risks, and benefits of vacuum, forceps, and

Cesarean section must be considered. [21] The choice of intervention needs to be individualized, as one is not clearly safer or more effective than the other. Failure of the chosen method, vacuum and/or forceps, to achieve delivery of the fetus in a reasonable time should be considered an indication for abandonment of the method. [22] Adequate clinical experience and appropriate training of the operator are essential to the safe performance of operative deliveries. The proportion of cesarean deliveries performed in the second stage of labor is projected to increase for several reasons. First, there has been a decline in the use of rotational and midpelvic forceps delivery. [23] Operative vaginal delivery rates have decreased in general with a shift toward vacuum-assisted vaginal delivery. Second, there is a national trend toward increased utilization of regional analgesia, which can prolong the duration of the second stage. The Obstetric Care Consensus- Safe Prevention of the Primary Cesarean Delivery endorsed by both the American College of Obstetricians and Gynecologists and the Society for Maternal-Fetal Medicine recommends that nulliparous women be allowed 3 hours and multiparous women 2 hours for pushing without epidural analgesia. A longer duration may be allowed in women receiving epidural analgesia. [17]

Conclusion

We observed from the study that majority were in 20-25 years range and most common indication for group I was fetal distress whereas for group II it was malposition. Most common maternal outcome was PPH and neonatal outcome was respiratory distress. The cesarean section in second stage labour was directly related to increase incidence of PPH, fetal distress and admission to NICU. When operative intervention in the second stage of labour is required, the options, risks, and benefits of vacuum, forceps, and Cesarean section must be considered.

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