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Original Research Article

Maternal and foetal outcome in second stage caesarean section: a prospective study

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ABSTRACT

Background: Caesarean section is the most commonly performed abdominal operation in women all over the world. Caesarean sections during the second stage labour accounts for approximately one fourth of all primary caesareans. Caesarean section at full cervical dilatation is technically difficult and is associated with increased trauma to the lower uterine segment and adjacent structures, as well as increased haemorrhage and infection. Aims and objectives were to determine the indications, maternal and foetal morbidity associated with caesarean section in the second stage of labour.

Methods: This prospective study included consecutive 50 cases of caesarean section deliveries conducted in second stage of labor for singleton live pregnancies at term. The data collected in the study was analyzed in terms of maternal demographics, indications of caesarean section, intra-operative and postoperative complications and neonatal outcomes.

Results: In our series of 50 deliveries, arrest of descent of fetal head due to malposition was the most common indication of caesarean section accounting for 74% and average procedure time was 45-70 minutes. PPH (62%) was the most common complication. Bladder injury was found in 14% cases. Neonatal outcome variables like APGAR<3 at 5 minutes, respiratory distress and neonatal death were observed in 7, 26 and 2 deliveries respectively.

Conclusions: Women undergoing cesarean section in second stage of labour are associated with increased maternal and fetal morbidity. They require special care and hence operation should ideally be performed and supervised by an experienced obstetrician. A proper judgement is required to take a decision for caesarean section at full cervical dilatation.

Keywords: Caesarean section, Cervical dilatation, Maternal and fetal outcome, PPH, Uterine tear

INTRODUCTION

Caesarean section is the most commonly performed abdominal operation in women all over the world. Incidence of caesarean section is increasing for greater safety of the baby, less pelvic floor trauma, avoidance of labour pains and convenience. In Medical colleges and teaching hospitals in India, the overall rate of caesarean deliveries is 24.4%. Incidence of second stage caesarean section has increased from 0.9% to 2.2%.¹ Caesarean section can be performed before onset of labour or during first or second stage of labour. Second stage of labour

starts with full cervical dilatation and ends with delivery of the foetus. In prolonged second stage, the interventions to facilitate delivery of the fetus are either assisted instrumental vaginal delivery or caesarean section.² Worldwide, 10-20% of deliveries require some form of interventions and this intervention is frequently caesarean section. The incidence of operative vaginal deliveries has decreased with a corresponding increase in caesarean section deliveries in the second stage of labor.³

Nowadays, decline in the use of instrumental delivery is due to lack of training, no supervision of junior staff in

decision-making and loss of technical skill associated with difficult-instrumental delivery. Caesarean section at full cervical dilatation with an impacted fetal head can be technically difficult and associated with postpartum hemorrhage, bladder injury, extended uterine tear leading to broad ligament haematoma, infection and longer hospital stay.⁴ The second stage caesarean section (CS) cause the fetal distress due to intra-operative fetal hypoxia caused by strong uterine contraction, deeply impacted fetal head and longer duration of second stage of labor. Although second stage CS may be necessary, many of them could be avoided by the attendance of skilled senior obstetrician and implementation of proper instrumental delivery.^{3,4}

The increasing trend of caesarean section at second stage is of major concern in modern obstetrics. Hence this study was conducted to know the indications of second stage cesarean sections in Department of Obstetrics and Gynecology and to assess maternal and neonatal outcome in second stage caesarean section.

Aims and objectives

To determine the indications, maternal and foetal morbidity associated with caesarean section in the second stage of labour.

METHODS

This prospective study was conducted in SLBS Government Medical College, Mandi, Himachal Pradesh, on 50 consecutive caesarean sections done in second stage of labour between October 2017 and September 2019. Fifty women who underwent second stage CS were analysed in terms of indications for second stage CS, intra-operative and postoperative complications, as well as fetal outcome. Data was collected after getting technical and ethical committee clearance.

Selection criteria

Age group between 18 to 40 years. Singleton pregnancy irrespective of parity. Period of gestation >37 weeks.

Exclusion criteria

Pregnancies with history of pre-existing medical illness. Pregnancies with major fetal abnormalities and fetal growth restriction. Multiple pregnancy. Preterm.

Type of anaesthesia and the operative technique were same in all the patients. The surgical technique of caesarean section was standardized. The data was collected in preformed proforma and written and informed consent was taken. All the data collected was pooled together and recorded and entered in master chart. Data analysis was done with the help of computer software MS Excel and SPSS version 17 for windows.

The maternal composite outcome in our study included one or more of the following: indications for second stage caesarean sections, intraoperative complications including uterine artery injury, extension of uterine incision, bladder injury, cervical laceration or requirement of hysterectomy, PPH, need for blood transfusion, duration of surgery, wound infection, duration of hospital stay, puerperal sepsis and maternal death.

Indicators of neonatal outcome in our study were APGAR score of newborns at 5 minutes, respiratory distress, admission to NICU and resuscitation and death. The duration of surgery was measured and was taken 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. PPH is defined as estimated blood loss >1000 ml. Post-partum endometritis refers to infection of decidua. It is defined as persistent postpartum temperature >38.5°C with malodorous vaginal discharge and uterine tenderness on bimanual examination and no other pelvic infection. Mother and baby were followed till discharge. Any complications to the mother and baby which developed during their hospital stay were also noted .

RESULTS

Total number of deliveries during the study period of 2 years was 7108. 2032 were delivered by caesarean section. Out of these our study was conducted on 50 consecutive caesarean sections performed in second stage. Among these 36 (72%) were primigravida and 14 (28%) were multigravida pregnancies. 6% of them were less than 20 years of age, 60% were in the age group of 20-25 years, 26% were between 26-30 years and only 8% were above 30 years.

Table 1: Maternal demographic details.

Variables	Number, N=50	Percentage	
Age distribution	<20 years	3	6
	20-25 years	30	60
	26-30 years	13	26
	>30 years	4	8
Parity distribution	Primi gravida	36	72
	Multigravida	14	28
Gestational age	37-38 weeks	19	38
	38-39 weeks	21	42
	39-40 weeks	7	14
	>40 weeks	3	6

The gestational age was between 37-38 weeks in 38% deliveries, 38-39 weeks in 42%, 39-40 weeks in 14% and more than 40 weeks in 6% deliveries. The demographic data is presented in Table 1.

Table 2: Indications for surgery.

Indications	Number, n=50	Percentage
Arrest of descent (malposition)	37	74
Arrest of descent (CPD)	11	22
Failed vacuum	2	4

Arrest of descent due to malposition was the most common indication for surgery in second stage in 37 cases (74%) followed by CPD in 11 cases (22%). Failed vacuum delivery accounted for 2 cases (Table 2). The most common complication in second stage CS was PPH in 31 cases (62%). Out of these blood transfusion was required in 20 cases (40%). Lateral uterine tear occurred in 9 cases (18%). There were no cases of bowel injury while bladder injury was reported in 7 cases (14%). Post-operative wound infection was seen 8 cases (16%) and post-operative fever was seen in 15 cases (30%) (Table 3).

Table 3: Incidence of intra operative and postoperative complications.

Variables	Number, N=50	Percentage
PPH	16	32
Need for blood transfusion	10	20
Lateral uterine tear	9	18
Bladder injury	7	14
Post op wound infection	8	16
Post op fever	15	30

The mean operative time required from incision to closure was 61.3 minutes and mean length of hospital stay was 6.8 days (Table 4). There were no cases of maternal deaths reported.

Table 4: Operative time and length of hospital stay.

Variable	Range	Mean
Operative time	45-70 minutes	61.3 minutes
Length of hospital stay	5-15 days	6.8 days

APGAR <3 at 5 min was seen in 7 cases (14%). Respiratory distress was seen in 26 cases (52%). Need for admission and resuscitation was needed in all the neonates who had respiratory distress. There were 2 neonatal deaths (4%) reported (Table 5).

Table 5: Neonatal complications.

Variables	Number, n=50	Percentage
5 minute APGAR <3	7	14
Respiratory distress	26	52
Need for resuscitation	26	52
Neonatal death	2	4

DISCUSSION

The rates of caesarean sections have risen steadily in the past two decades and may be associated with a disproportionate rise in second stage of caesarean sections. Increasing medical litigations in current obstetrics and concerns over neonatal and maternal morbidity associated with difficult or failed instrumental delivery may contribute to this trend. Majority of women were in the age group 20-25 years (58%) which was comparable to study by Landon et al in which 61% women were in age group 21-30 years.⁵ The incidence of second stage caesarean sections was more in primigravida (72%) than multigravida (28%) in the present study; this observation was similar to study by Babre et al.⁶ The increased frequency of second stage caesareans in primigravidae could be due to cephalopelvic disproportion, rigid perineum and lack of experience of previous labor. Majority of cases were of gestational age 38-39 weeks (42%). In our study arrest of descent of fetal head due to malposition (74%) was the most common indication for caesarean sections in 2nd stage of labour.

Caesarean section in the second stage of labor is technically difficult and was 2.6 times likely to have intraoperative traumatic complications. The difficulty in delivering the fetal head arises because of lack of space between the bony pelvis, pelvic soft tissues and the fetal head and the degree that the head has moulded into the pelvis.^{5,6}

Intraoperative disengagement of the fetal head continues to pose a challenge to obstetricians. The incidence of uterine incision extension in second stage caesarean sections may be as high as 30%. It is thought that when performing caesarean sections at full dilatation, a higher incision in the uterus may be necessary. A standard incision may risk incising the bladder or the vagina, or may affect the integrity of the cervix. Lower-segment incisions may also be at increased risk of tearing and be more difficult to repair.⁷ In our study we experienced incidence of uterine tear in 9 (18%) deliveries, which were managed intraoperatively by repairing techniques.

Development of uterine atony and requirement of uterine artery ligation in the case of severe hemorrhage are also found to be more frequent in caesarean section performed in the second stage of labor and can be due to the prolonged labor resulting in uterine inertia. In our study 32% cases experienced PPH whereas study conducted by Baloch et al observed PPH in only 12.5%.⁸

As compared to Ascioglu et al which revealed a significant increase in mean blood loss in second stage cesarean sections, in our study 20% cases required blood transfusion.⁹ Studies have reported pelvic floor trauma, particularly bladder and bowel problems. In our study, 14% patients had bladder injury but we didn't encounter any bowel injury.

Cebekulu et al from Johannesburg, South Africa, reporting on 39 cases and 39 controls, found that second-stage caesarean section was associated with more postoperative fever.¹⁰ In present study post-operative fever was noted in 30% and postoperative wound infection in 16% of cases who delivered by second stage caesarean section and contributing to relatively longer duration of stay in the hospital whereas in the study by Baloch et al wound infection was present in 8.33% cases.⁸

In various studies it has been quoted that duration of hospital stay for patients in second stage caesarean section is increased. In the study by Seal et al, the mean length of stay in the hospital after delivery was higher in second stage caesarean section i.e. 6.4 days.¹¹ In our study mean length of hospital stay was 6.8 days which was comparable to study by Seal et al. Ojeme et al 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.¹² There was no case of maternal mortality in our study.

A recent study by Das et al demonstrated a statistically significant increase in admission to NICU, septicaemia, low 5 minute Apgar (<3) and neonatal trauma.¹³ In our study APGAR score below 3 at 5 minutes was found in 14% after second stage caesarean sections. There were 26 cases who required resuscitation procedures and NICU admission for respiratory distress. There was 4% neonatal mortality in our study. The unfavorable neonatal outcomes are probably due to prolonged labour which leads to hypoxia.^{14,15}

A recent study by Radha et al demonstrated a statistically significant increase in birth asphyxia, admission to the neonatal intensive care unit, sepsis, seizures, need for ventilation and neonatal death.¹⁶

The small sample size, short follow up period, not assessing the instrumental deliveries which could prevent second stage caesarean sections and effect of second stage caesarean sections on subsequent pregnancies were limitations of our study.

CONCLUSION

Caesarean sections during the second stage are increasing in prevalence. Caesarean section at full cervical dilatation is associated with increased risk of adverse outcome for both mother and foetus. Maternal risks of second stage caesareans include greater risk of PPH, extension tears of the uterine angle and longer hospital stay. Caesarean delivery performed during the second stage of labour increases the incidence of foetal respiratory distress, admission to the neonatal intensive care unit and foetal death due to foetal head impaction into the maternal

pelvis and prolonged second stage labour. Hence it is recommended that second stage caesarean should ideally performed and supervised by an experienced obstetrician. Timely decision for caesarean section should be taken especially when risk factors for failure to progress are present.

For decision making, the involvement of senior obstetrician is desired for safe trial of vaginal delivery or CS. Alarming the neonatologist beforehand are recommended in all second stage deliveries. The modern management of the second stage of labour will have to consider the risks and benefits of the instrumental vaginal delivery versus caesarean section.

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