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STUDY ON CAESAREAN SECTIONS AT FULL CERVICAL DILATATION: INDICATIONS, MATERNAL AND NEONATAL OUTCOMES

Obstetrics & Gynaecology

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ABSTRACT

Introduction: The increasing incidence of caesarean sections at full cervical dilatation during the second stage of labour presents rising concerns due to its associated maternal and neonatal risks. The common indications for this procedure include cephalo-pelvic disproportion and fetal distress. While necessary in certain situations, CS at full dilatation often involves technical challenges and higher morbidity rates. **Materials and Methods:** This retrospective study was conducted at Alluri Sitarama Raju Medical College, Eluru, from April 2023 to April 2025. 168 women who underwent caesarean section in the second stage of labour andmet the inclusion criteria were studied. Data was obtained from hospital records, including maternal demographics and obstetric history, indication for caesarean section,intraoperative challenges, maternal complications, and fetal outcomes. Parameters such as blood loss, uterine extensions, Apgar scores, and NICU admissions were recorded and analyzed systematically. **Results:** Among the 168 cases, the most common indications for second-stage CS were cephalo-pelvic disproportion (34.52 %) and fetal distress (27.97 %). Maternal complications included postpartum haemorrhage (32.14 %), requiring blood transfusions in 19.04 % of cases, and uterine incision extensions (12.5 %). Neonatal outcomes showed that 38.09 % of infants required NICU admission, predominantly for respiratory distress, and 6.5 % had low APGAR scores. 2 cases of neonatal death were observed. The average length of hospital stay was 6.6 days, and no maternal deaths occurred. **Conclusion:** Second-stage caesarean sections, especially at full cervical dilatation, are associated with significant maternal and neonatal morbidity. Common complications include postpartum haemorrhage, uterine injury, and neonatal respiratory distress. Training in obstetric skills, early identification of obstructed labour, and skilled intervention are critical to improving maternal and neonatal outcomes in these high-risk cases. Further efforts to promote instrumental vaginal delivery and enhance clinical training could help reduce the frequency and complications of second-stage CS.

KEYWORDS

INTRODUCTION

The rising incidence of caesarean section at full cervical dilatation during the second stage of labour is a growing concern in modern obstetrics. Globally, CS rates have increased significantly, with second-stage CS rates rising from 0.9% to 2.2%.[1] This trend is attributed to multifactorial causes, including declining use of instrumental deliveries, lack of training in second-stage decision-making, and fear of litigation. Caesarean at full dilatation presents greater technical challenges due to a thinned-out, edematous lower uterine segment and a deeply engaged fetal head, often requiring specialized techniques such as the Patwardhan or push method. Maternal complications—such as uterine angle extension, postpartum haemorrhage, bladder injury, and prolonged operative time—are more frequent, as are neonatal morbidities like hypoxia, trauma, and prolonged NICU stays. Proper training and timely involvement of experienced obstetricians are crucial to improve outcomes and reduce risks associated with second-stage CS.

AIMS AND OBJECTIVES

Aim

To evaluate the indications, and maternal and neonatal outcomes associated with caesarean section performed at full cervical dilatation during the second stage of labour.

Objectives

1. To assess the common indications for second-stage caesarean section.
2. To evaluate maternal intraoperative and postoperative complications, such as uterine incision extension, haemorrhage, bladder injury, postoperative fever, wound infection and prolonged catheterisation.
3. To analyse neonatal outcomes including APGAR score, respiratory distress, NICU admissions and neonatal mortality.

MATERIALS AND METHODS

This retrospective study was conducted at Alluri Sitarama Raju Medical College, Eluru, from April 2023 to April 2025. During the study period, a total of 9818 deliveries were conducted, out of which 2789 were caesarean sections. Among them, 168cases who underwent caesarean section in the second stage of labour were found tomeet the inclusion criteria and were studied.

Data was obtained from hospital records, including maternal demographics and obstetric history, indication for caesarean section. Intraoperative findings including blood loss, need for blood transfusion, extension of uterine incision, and bladder injury were noted. Postoperative complications such as post-op fever, post-op wound infection, prolonged catheterization (>48 hours) were noted. Neonatal complications including APGAR score at 5 min, respiratory distress, need for NICU admission, neonatal outcome were noted. All of the patients received the same kind of anesthesia and underwent similar operative technique. A premade proforma was used to gather the data.

All variables were categorical and presented as frequency and percentages for statistical analysis. Data was represented in tables and summarized descriptively.

Budget: Nil.

Ethical Consideration: This study was done after obtaining institutional research and ethics committee approval by submitting the protocol. Waiver of consent was taken from the ethics committee as it's a retrospective observational study and didn't involve any intervention by the principal investigator.

Inclusion Criteria

Antenatal patientsundergoing caesarean section at full cervical dilatation in ASRAM, Eluru, withaged between 18-40 years of age, with singleton pregnancy, period of gestation >37 weeks, and cephalic presentation.

Exclusion Criteria

Pregnancies with major fetal abnormalities or fetal growth restriction, intrauterine death, history of pre-existing medical disorders, presence of other obstetric indications for caesarean section such as placenta previa, and cases with insufficient data for analysis.

RESULTS AND ANALYSIS

Over the course of the 2-yearstudy period, a total of 9818 deliveries were conducted at our institution, of which 2789 (28.4%) were caesarean sections. Among these, 182 cases (6.5% of all caesarean sections; 1.85% of all deliveries) were performed in the second stage of labour. From these 182 cases, all patients meeting the inclusion criteria were included in the present study, yielding a final sample size of

168.Of these pregnancies, 113 (67.26 %) were primigravida and 55 (32.73 %) were multigravida.7.73 % were under the age of 20, 64.28 % were in the 20–25 age range, 20.23 % in the 26–30 age range, and 7.73% of them were over 30 years.

36.3 % of the deliveries occurred between 37-38 weeks of gestational age, 44% of cases at 38-39 weeks, 15.47 % of cases at 39-40 weeks, and 4.16% of cases occurred after 40 weeks of gestation. The demographic information is shown in Table 1.

Table 1: Maternal Demographics

Maternal Characteristics		Number (N=168)	Percentage
Age Distribution	<20 years	13	7.73 %
	20-25years	108	64.28 %
	26-30years	34	20.23 %
	>30 years	13	7.73 %
Parity Distribution	Primigravida	113	67.26 %
	Multigravida	55	32.73 %
Gestational Age	37-38weeks	61	36.3 %
	38-39weeks	74	44.04 %
	39-40 weeks	26	15.47 %
	>40 weeks	7	4.16 %

Cesarean section indications are displayed in Table 2. Cephalo-pelvic disproportion (34.52 %) and fetal distress (27.97%) were the most common indications. Deflexed head, persistent occipito-posterior, deep transverse arrestwere the others.

Table 2: Indications For Caesarean Sections

Indication	Number (N=168)	Percentage
Cephalopelvic disproportion	58	34.52 %
Deep transverse arrest	22	13.09 %
Persistent occipito-posterior	17	10.11 %
Deflexed head	24	14.28 %
Fetal distress	47	27.97 %

Table 3 lists out all the intra-operative and post-operative complications. The most common complication in second-stage caesarean was postpartum haemorrhage, reported in54 cases (32.14%). 32of these cases (19.04 %) required a blood transfusion. In 21 cases (12.5 %), extension of uterine incisionwas noted and repaired. While bladder injury was recorded in 3cases (1.78 %), there were no incidences of bowel injury. There were 44 cases (26.19 %) of post-operative fever and 23 cases (13.69 %) of post-operative wound infection. Prolonged catheterization (>48 hours) was required in 42.26 % of the cases to help prevent pressure-related injuries, urinary retention and bladder injury, which are complications of obstructed labour.The average length of hospital stay was 6.6 days. No maternal deaths were reported.

Neonatal outcomes in terms of APGAR score, NICU admission, Respiratory distress and neonatal death were analyzed as listed in Table 3. The mean birth weight was 3.21 kg. APGAR score <3 was noted in 11 cases (6.5 %). 64 babies (38.09 %) required NICU admission, with respiratory distress being the main indication for admission, seen in 44 out of 168 cases (26.19 %). There were2 cases (1.19 %) of neonatal death observed.

Table 3: Maternal and Neonatal Complications

COMPLICATIONS	Number (N=168)	Percentage
Intraoperative Complications		
Postpartum Haemorrhage	54	32.14 %
Need for blood transfusion	32	19.04 %
Extension of uterine incision	21	12.5 %
Bladder injury	3	1.78 %
Postoperative Complications		
Post-op fever	44	26.19 %
Post-op wound infection	23	13.69 %
Prolonged catheterization (>48 hours)	71	42.26 %
Neonatal Complications		
APGAR score <3 at 5 min	11	6.5 %
Respiratory distress	44	26.19 %
Need for NICU admission	64	38.09 %
Neonatal death	2	1.19 %

DISCUSSION

A disproportionate increase in second stage cesarean operations may be the cause of the steady increase in caesarean section rates over the last 20 years. This trend may be influenced by the rise of medical lawsuits in modern obstetrics as well as worries about mother and newborn morbidity linked to challenging or unsuccessful assisted delivery. However, caesarean section at full cervical dilatation during the second stage of labour itself presents notable clinical and technical challenges and is associated with increased maternal and neonatal morbidity. In our study, the majority of women (64.28%) were in the 20–25 year age range, which was similar to a study by Landon et al. where 61% of women belonged to similar age group.[2]Majority (67.26 %) of second-stage CS were performed on primigravida women, a finding consistent with study done by Babre et al.[3], which may be due to lack of prior labor experience, stiff perineum, and cephalopelvic disproportion.

Cephalopelvic disproportion (34.52%) and fetal distress (27.97%) were the most common indications in this study. This was similar to the findings obtained by Kumaresan S et al.[4], which also identified cephalopelvic-disproportion (34.8%) and non-reassuring fetal heart rate patterns (18.4%) as leading causes of second-stage CS.

Women undergoing second-stage cesarean births experienced longer operating times, greater blood loss, higher rates of intraoperative trauma, postpartum haemorrhage, blood transfusions, relook laparotomy, hysterectomy, postpartum pyrexia and wound infection, leading to longer hospital stays, according to Ojeme et al.[5] In this study too, the intraoperative complication rate was significant, with postpartum haemorrhage occurring in 32.14 % cases. In a study conducted by Baloch et al, PPH was observed in 12.5% cases.[6] Uterine incision extension was seen in 12% of cases in this study. These are consistent with studies showing increased surgical difficulty due to the deeply impacted fetal head and a thinned-out lower uterine segment.[7] Bladder injury was observed in 1.78 % of cases, highlighting the anatomical risks involved in second-stage CS. These findings were consistent with findings of Kumaresan S et al. [4]Disengaging the fetal head during second-stage caesarean sections remains a significant challenge for obstetricians. Uterine incision extensions can occur in majority of these procedures. Therefore, a higher uterine incision may be required when operating at full cervical dilatation to avoid injury to the bladder, vagina, or cervix as standard lower-segment incisions at this stage may be more prone to tearing and are often technically more difficult to suture.In our study, 19.04 % of cases required blood transfusions. In a study byAsicioglu et al.[8], a considerable increase in mean blood loss in second stage cesarean procedures was observed.

Second-stage cesarean sections were linked to higher rates of postoperative fever, according to Cebekulu et al.[9]26.19 % of patients who had a second stage caesarean section in the current study had post-operative fever, and 13.69 % had postoperative wound infection, which resulted in a comparatively longer hospital stay. Baloch et al.[6]reported a wound infection incidence of 8.33%.

Longer length of hospital stay for patients undergoing a second stage cesarean section has been reported in a number of studies. Average length of hospital stay following operationwas reported to be 6.6 days in this study, which was similar to Seal et al.'s study[10] with a reported average hospital stay of 6.4 days. No maternal mortality was reported in this study.

Neonatal morbidity in terms of NICU admissions, fetal acidemia, hypoxemiais reportedly higher in second stage caesarean sections. This is likely to be a result of increasing fetal compromise with prolonged duration of maternal bearing down and hypoxia, and not a result of the procedure. In our study, 64neonates out of the 168 cases required NICU admission, of which 44 were for respiratory distress. 11 cases had an APGAR score <3 at 5 min and 2 cases of neonatal death wereobserved.

Similar findings were observed in a study by Das et al demonstrated a statistically significant increase in admission to NICU, septicemia and low 5 min APGAR.[11]

CONCLUSION

Second-stage caesarean sections, performed at full cervical dilatation, are increasingly encountered in modern obstetric practice and are associated with elevated maternal and neonatal risks. In this retrospective study, we observed that postpartum haemorrhage,

uterine incision extensions, and postoperative complications such as fever and wound infection were among the most common maternal morbidities. Neonatal complications included a high rate of NICU admissions, primarily due to respiratory distress, and a small proportion with low APGAR scores or neonatal death. The challenges in these procedures are primarily due to the deeply engaged fetal head, thinned and edematous lower uterine segment, and difficulty in disengaging the fetus safely. These factors contribute to longer operative time and increased risk of bladder and soft tissue injury. The rising incidence of second-stage caesarean sections reflects a decline in instrumental delivery use and limited training in second-stage decision-making. Our findings underscore the need for improved obstetric training, early identification of obstructed labour, and timely intervention by experienced clinicians. Institutional protocols that support assisted vaginal delivery and provide simulation-based training can help reduce the frequency and complications of second-stage CS. Ultimately, careful labour monitoring and skilled operative techniques are vital to improving outcomes for both mother and newborn.

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