RESEARCH
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FETOMATERNAL OUTCOME IN SECOND STAGE CAESAREAN SECTION IN A TERTIARY CARE CENTRE – A RETROSPECTIVE STUDY

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Abstract
BACKGROUND: A caesarean section done at full cervical dilatation, thinned out lower segment, deeply engaged head is considered as second stage caesarean section. Most common indication for second stage caesarean section is deep transverse arrest. In the present obstetrics practice, one of the major difficulties is to make a firm decision for caesarean section during second stage of labour. Second stage of labour is associated with severe maternal and neonatal outcome. This study aims to observe the maternal and neonatal outcome in second stage caesarean section.
METHOD: This was a retrospective observational study in which 50 second stage caesarean section patients were observed. The indication for the caesarean section, intraoperative period, post operative period and neonatal outcome were recorded and analysed.
RESULTS: Out of the 50 second stage caesarean sections observed, most common indication was arrest of descent (50%) followed by thick meconium-stained liquor with fetal distress (28%), Right occipitoposterior (10%), Failed instrumental delivery (4%) and deep transverse arrest (2%) being the least probable cause. Second stage CS is associated with increased intra operative complications like transient blood-stained urine (60%), extension of uterine angle (40%), PPH (40%) and Bladder injury (4%). Post operative complications like prolonged catheterisation (80%), wound infection (16%) was observed. Neonatal morbidity was observed in 20% of babies out of which the complications were respiratory distress syndrome (50%) and Neonatal hyperbilirubinemia (50%)
CONCLUSION: Second stage caesarean section requires great expertise and timely judgement. It is associated with high incidence of maternal and neonatal complications. Hence, second stage of caesarean section must be done by well versed and experienced obstetrician.

Introduction

Caesarean delivery defines the birth of a fetus by laparotomy and then hysterotomy. This definition is not applied to removal of the fetus from the abdominal cavity in case of uterine rupture or of abdominal pregnancy. Caesarean section is the most performed abdominal operation all over the world 1,2.

The rate of rise of Caesarean section can be attributed to the increase in safety of the procedure, enhanced surgical techniques, improved antibiotics, increase in number of women requesting for Caesarean sections, decrease in the rate of instrumental vaginal deliveries, improved anaesthesia amongst others3.Caesarean section is associated with higher likelihood of immediate and remote complications for both mother and fetus as compared to vaginal delivery4.

Second stage of labour begins when cervical dilatation is complete and end with the fetal delivery1. There have been rampant discussions going on in the recent years regarding the duration of the second stage of labour. Previously, the second stage of labour was limited to < 2 hours 5,6. Recently the duration of second stage has been extended up to three hours when the labour is managed with regional anaesthesia 7,8. In case of any complications in the second stage of labour the obstetrician can intervene to facilitate the delivery of the fetus by assisted vaginal delivery with the help of vacuum or forceps or operative delivery like caesarean section9.

Caesarean section at full dilatation is a more challenging procedure than Caesarean section in early labour and requires more expertise10. Generally, the reasons that make Second stage caesarean section challenging are deeply engaged fetal head, less amount of liquor and thinned out the lower uterine segment, thus this has high risk of maternal morbidities, for instance tear in the lower uterine segment, extension of the uterine incision, injury to the urinary bladder, postpartum pyrexia, prolonged catheterization, and longer duration of hospitalization11-14. Neonatal morbidities commonly associated with the CS in second stage are birth asphyxia, increased rate of neonatal intensive care unit (NICU) admission, fetal birth injuries, hypoxic-ischemic encephalopathy, and even neonatal death 15, 16.

According to the RCOG, about 35% of caesareans for singleton pregnancies are performed because of failure to progress in labour, of which a quarter is done at full cervical dilatation. Out of these, in 55% of cases no attempt was made to achieve a vaginal birth with either forceps or ventouse. Discussions regarding the increase in elective caesarean rates over the past 20 years have been widely discussed all over the world, but very

little attention has been paid to the rise in second stage CS rates17. Hence, this study is being done to study the maternal and fetal morbidity associated with women undergoing caesarean section during the second stage of labour.

METHODOLOGY

This is a hospital based retrospective study conducted over a period of one year in patients who delivered through caesarean section in second stage of labour in Vinayaka Mission's Kirupananda Variyar Medical College and hospitals, Salem from November, 2022 to November, 2023.

The study population taken was patients who were admitted in the antenatal ward of obstetrics and gynaecology department in for delivery.

Inclusion criteria included-women who delivered through Caesarean section in second stage of labour at Term period of gestation with singleton pregnancies having cephalic presentation having no comorbidities.

Exclusion criteria excluded patients with multiple pregnancy, malpresentation and preterm deliveries. Patients with comorbid conditions like diabetes and preeclampsia
were excluded from the study.

Women who underwent second stage caesarean sections were analysed in terms of indications, intraoperative complications, postoperative complications, and perinatal outcomes. Intraoperative complications like haematuria, uterine incision extension, and atonic postpartum haemorrhage were observed from procedure notes and patient charts. Post operative complications like postoperative fever (> 100.4 0F), prolonged catheterization (> 24 hours), prolonged hospitalization (> 72 hours), and perinatal outcome were noted from the patient's chart. All the collected data were recorded and entered in the master chart. Data analysis was done using SPSS version 21.

RESULT

The purpose of the current study was to retrospectively analyse the second stage of CS and its relationship to pregnancy outcomes. Total 120 antenatal cases were chosen for this study. Out of the 120 antenatal cases who were in second stage of labour 60 underwent normal vaginal delivery while 10 underwent assisted vaginal delivery and remaining 50 underwent Emergency caesarean section in second stage of labour.

TABLE 1: MODE OF DELIVERY

Mode of Delivery	Number	Percentage
Normal Vaginal Delivery	60 Cases	50%
Assisted Vaginal Delivery	10 Cases	8.3%
Emergency Caesarean Section	50 Cases	41.6%

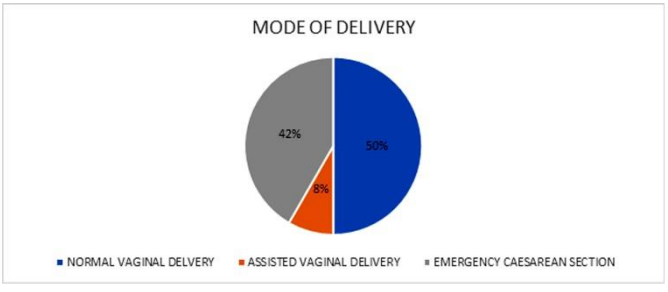

FIGURE 1: MODE OF DELIVERY

Out of the 50 patients who underwent second stage caesarean section, Indications of the caesarean section was arrest of descent for 50% of the patients, thick meconium-stained liquor for 28% of the cases, Right Occipitoposterior position for 10%, Failed instrumental delivery for 4% of the caesarean section and 2% of the caesarean section was done in view of deep transverse arrest

TABLE 2: Indications of caesarean section

Indications of Caesarean Section	Number of Cases	Percentage
Arrest of Descent	25 Cases	50%
Thick Meconium-Stained Liquor	14 Cases	28%
Right Occipitoposterior	5 Cases	10%
Failed Instrumental Delivery	2 Cases	4%
Deep Transverse Arrest	1 Case	2%

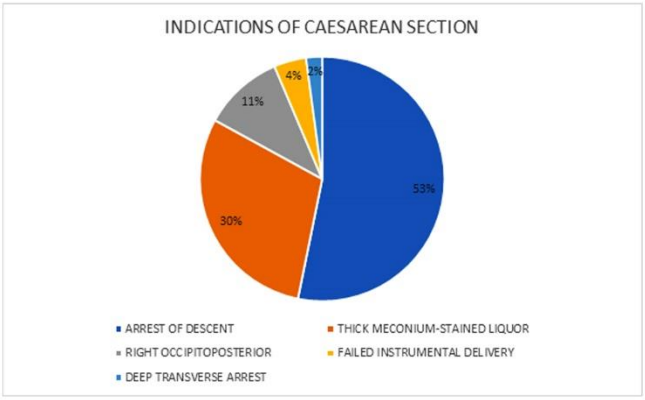

FIGURE 2: Indications of caesarean section

In the study of the intra op complications dealt in these cases 70% of the cases had transient blood-stained urine which resolved in a short period of time. 60% of the cases developed uterine atony which was medically managed, out of that 10% of the cases required surgical management. Uterine incision extension was seen in 40% of cases and bladder injury which required surgical correction occurred in 4% of cases.

TABLE 3: Intra op complications of caesarean section

Intra Operative Complication of Caesarean Section	Number of Cases	Percentage
Transient blood-stained urine	30 CASES	60%
PPH	20 CASES	40%
Uterine incision extension	20 CASES	40%
Bladder injury	2 CASES	4%

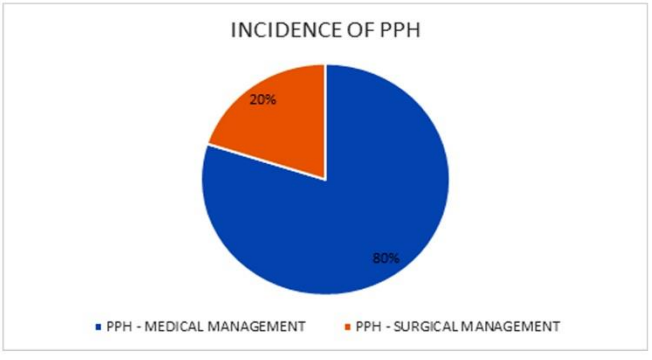

FIGURE 3: Incidence of PPH

TABLE 4: Incidence of post-partum haemorrhage

Post Partum Haemorrhage	No. of Cases	Percentage
Medically Managed	16 Cases	80%
Surgical Management	4 Cases	20%

In the study of post op complications dealt by patients who underwent second stage caesarean section 80% of the cases had prolonged catheterisation following the procedure in view of blood-stained urine or bladder injury or extension of uterine incision, 16% of cases had wound infection mostly detected by post op day 5 and 4% of the cases had post-partum pyrexia.

TABLE 5: Post op complications of caesarean section

Post OP Complications	Number of Cases	Percentage
Prolonged catheterisation	40 cases	80%
Wound infection	8 cases	16%
Post partum pyrexia	2 cases	4%

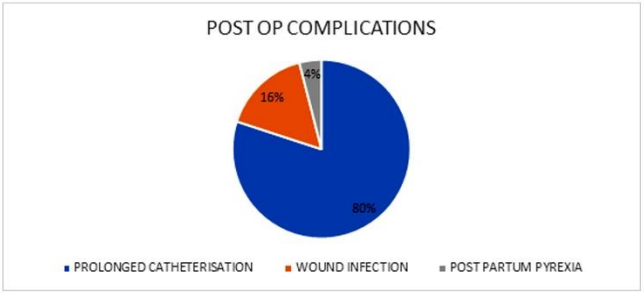

FIGURE 4: Post op complications of caesarean section

While observing the neonatal complications of the babies born in second stage caesarean section,20% of the babies required NICU admission out of that 60% of the babies developed hyperbilirubinemia on post op day 3, 20% of the babies developed birth asphyxia immediately post op which resolved in 1-2 days, 10% of the babies developed respiratory distress syndrome, and 10% of the babies developed meconium aspiration syndrome.

TABLE 6: Incidence of NICU admission

	NICU Admission	Percentage
NICU admission required	10	20%
No NICU admission	40	80%

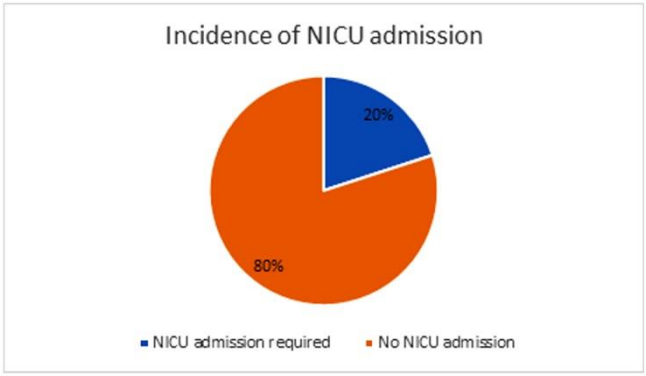

FIGURE 5: Indication

TABLE 6: Indication of NICU admission

	Number of cases	Percentage
Hyperbilirubinemia	6 cases	60%
Birth asphyxia	2 cases	20%
Respiratory distress syndrome	1 case	10%
Meconium Aspiration syndrome	1 case	10%

DISCUSSION

This was a prospective observational study conducted at an urban medical college from November 2022 to November 2023. A second-stage labour Caesarean section involves a technically challenging procedure that distorts the structure of the mother's pelvis and significantly impacts the fetal head inside the mother's pelvis. The fetal head was engaged in the pelvis, the uterine muscles were thin and stiff, and it is generally challenging to identify the bladder and lower segment during caesarean section conducted in the second stage of labour. According to the WHO, the Robson classification of caesarean section aids in optimizing the use of CS, assessing strategies aimed at lowering the CS rate, and ultimately enhancing clinical practices and care quality across a range of healthcare environments. The current study set intended to examine the association between pregnancy outcomes and the second stage of CS in hindsight.

In this study, arrest of descent of the head (50%) was the most likely indicator of a second stage caesarean operation. Cephalopelvic disproportion (48.5%) was the most often reported sign of a second stage caesarean delivery in research by Belay et al.18

In a study done by Dahiya et al the most common intraoperative complication reported was extension of uterine incision (16%) while in the study conducted in this particular tertiary care centre the most common intraoperative complication reported was transient blood stained urine which was in 70% of cases while extension of uterine incision was seen in 40% of cases.19 This result was somewhat similar to the study done by Thirukumar et al in Tamil Nadu, India where they stated that blood-stained urine was the major complication observed in 60% of patients.20

According to this study atonic postpartum haemorrhage was seen in 20 cases (40%) out of which 4 cases could not be managed medically and required surgical management in the form of B Lynch compression sutures and one patient required peripartum hysterectomy. This was much higher compared to the study done by Babre V M et al (11.5%)21. This finding could be due to the longer duration of labour resulting in uterine inertia. Uterine angle extension was also seen in a similar frequency to that of atonic PPH, that is in 20 cases (40%) which is also a higher rate as opposed to the study done by Jyoti Jeyaram et al in which they only had 15.38% of patients having uterine angle extension22. This increased frequency could probably due to deeply impacted head along with thinning of the lower segment. In this study, we have observed that faster decision making and senior obstetricians performing second stage caesarean section has reduced the incidence of intra operative and post operative complications.

Prolonged catheterisation (80%) was the most common post operative complication seen in our study which was mainly due to transient blood-stained urine and in two cases due to mild bladder injury. Some patients in view of post-partum haemorrhage they required prolonged catheterisation (80%). This was in the accordance with the study done by Dahiya et al where they also stated that the most common post operative complication was prolonged catheterisation (0.23%)20. Though the frequency was higher in this study. This difference could be due to smaller sample size and individual obstetrician's judgement regarding the duration of catheterisation.

In this study, 20% of the babies (10 cases) required NICU admission for at least 1 to 2 days. Out of which 2 babies (20%) required prolonged NICU admission lasting for 6 days. Out of these 10 cases, 6 neonates (60%) developed hyperbilirubinemia on day 2 or day 3 postnatally and required NICU admission and phototherapy. Out of the total 10 cases, 2 cases (20%) developed birth asphyxia immediately after birth which required NICU admission for O2 administration via CPAP or nasal cannula.

In a study conducted by Patra et al 52.2% of babies required NICU admission which is higher than our study where only 20% of babies required NICU admission. Out of this, 60% of the babies were admitted in view of hyperbilirubinemia which was the most common indication for NICU admission in this study as opposed to the study done by Patra et al in which only 23.4% of babies had neonatal jaundice. The most common indication for NICU admission in their study was birth asphyxia which was 29.4% which was also higher compared to the incidence of birth asphyxia (20%) in this study.

CONCLUSION

A proper judgment and skilled obstetrician are required to perform a second-stage caesarean section. From this study we can conclude that compared to a caesarean section performed during the first stage of labour, second stage caesarean section is associated with higher risk of morbidity for both mother and the newborn. Hence, a proper judgement, a skilled obstetrician and adequate infrastructure to tackle neonatal issues and obstetric emergencies like refractory atonic post-partum haemorrhage is required. This study has scope for improvement by increasing the sample size. Second stage CS can be avoided by using partograph, rational use of oxytocin, proper and selective instrumental delivery, and lastly but most importantly the presence of senior and expert obstetricians in decision making.

The second stage CS must be approached and conducted by an efficient team of doctors and other staff to get a healthy baby and a healthy mother.

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