

Research Article



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EVALUATE THE FETO-MATERNAL OUTCOMES AND INDICATORS OF ROBSON GROUP 1 CASES RECEIVING CAESAREAN SECTION

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ABSTRACT

Background: Caesarean section rates have risen in India in recent decades, and Robson's group 1 comprises nulliparous women with a singleton pregnancy, cephalic presentation, and gestational age more than or equal to 37 weeks who go into spontaneous labor. There is less information on the indications and outcomes of Robson group 1 patients receiving caesarean section.

Aim: The current study sought to assess the fetal-maternal outcomes and indications of Robson group 1 patients receiving caesarean section.

Methods: The current study included 14048 neonates delivered by caesarean section, of which 3272 were from Robinson Group I. The research looked at nulliparous females who were 37 weeks or older, had a singleton pregnancy, and had spontaneous labor beginning. They were assigned to Robson Group 1 and had caesarean surgery. The data collected were statistically examined.

Results: During the study period, 31718 deliveries were performed, with 14048 neonates born via caesarean section and 3273 from Robson's Group 1. Meconium-stained liquor was the most prevalent reason for a caesarean delivery among study participants, accounting for 24.7%, whereas precious pregnancy accounted for just 2.1%. The intraoperatively, most prevalent, and least common maternal consequence was atonic postpartum hemorrhage and fetal scalp damage found in 10.3% and 0.5% of participants respectively. The most and least prevalent acute maternal complications were spinal headache and thromboembolic event, which occurred in 12.9% and 1.5% of participants, respectively. The most frequent and least common early maternal problems were surgical site infection and lower respiratory tract infection, which affected 11.3% and 4.1% of participants, respectively. For fetal problems, hyperbilirubinemia and stillbirths occurred in 19.1% and 2.6% of cases, respectively.

Conclusion: The current study suggests that individuals in spontaneous labor should have caesarean section only when absolutely necessary for the fetus' and mother's recovery. It is critical to intervene and minimize the rate of caesarean section, especially in Robson group 1, which will lead to lower initial and future rates of caesarean section.

Keywords: Caesarean section, fetal-maternal outcome, fetal outcomes, maternal outcomes, Robson Group 1

INTRODUCTION

Caesarean section is the surgical process used to deliver the fetus, membranes, and placenta through a uterine and abdominal incision. It is the most popular major surgical operation worldwide. Currently, the global rate of caesarean section is 15%, which is evenly spread around the globe. In India, the rate of caesarean section has risen from 3% to 7% to 8.5% over the previous two decades, from 1992-93 to 1998-99 and 2005-6. Caesarean section rates increased unexpectedly to 30% in lower respiratory tract infections between 2019 and 2020.1

To further understand this growth and assess successful actions, WHO recommended a framework for comparing and tracking caesarean section rates in the same environment over time and in other settings.

This method, known as Robson's classification, was initially published in 2001 by Michael Robson and is also known as the TGCS (Ten Group Classification System), and is used to classify pregnant females who give birth. Pregnant women are categorized into ten categories based on fundamental obstetric parameters such as prior caesarean section, number of fetuses, fetal presentation, method of commencement of labor, gestational age, and parity. These groups are structured in such a manner that they are both inclusive and mutually exclusive. WHO and FIGO endorsed the tool in 2014 and 2016 for monitoring rates across time and between facilities, citing its flexibility, repeatability, robustness, and simplicity.²

Robson's group 1 contains nulliparous females with cephalic presentation, singleton pregnancy, and gestation age ≥ 37 weeks who have spontaneous labor. According to the existing literature, the most common indication for a caesarean section is meconium-stained liquor, followed by cephalopelvic disproportion, oligohydramnios, prolonged labor, cervical dystocia, placenta praevia, cord prolapse, abnormal fetal heart rate tracing, precious pregnancy, and suspected fetal macrosomia in terms of frequency.³

Intraoperative maternal problems include atonic uterus, bladder base damage, and bleeding puerperal sepsis, whereas postoperative complications include surgical site infection, urinary tract infection, fever, rectus sheath hematoma, and hemorrhage. These problems include thromboembolic events and the related range of anesthetics, as well as extended hospital stays.⁴

Neonatal problems include neonatal mortality, NICU (neonatal intensive care unit) admission, poor APGAR score, sepsis, hypoxic-ischemic encephalopathy, hyperbilirubinemia, transitory tachypnea in neonates, birth asphyxia, and stillbirth.⁵ The current study sought to determine the indication for caesarean section in patients from Robson's group 1, to examine the incidence of feto-maternal outcomes using diagnostic and clinical techniques, and to investigate other demographics in females in this group.

MATERIALS AND METHODS

The current prospective observational study sought to determine the indication for caesarean section in patients from Robson's group 1, to analyse the incidence of feto-maternal outcomes based on diagnostic and clinical methods, and to investigate other demographics in females from this group. The research subjects were members of the Institute's Department of Obstetrics and Gynaecology. All individuals provided verbal and written informed consent before to participation.

The study included nulliparous females who underwent caesarean surgery, had a singleton pregnancy, had cephalic presentation, and had a gestational age of ≥ 37 weeks going into spontaneous labor (Robson's group 1). The research excluded participants who were not in labor or had been induced into labor, multiparous or multigravida females, gestational age less than 37 weeks, secondary abdominal pregnancy, pregnancy with a scarred uterus, congenital fetal malformations, multiple pregnancies, and malpresentation.

All of the included research individuals were separated into groups based on Robson's classification and assigned to Group 1 after suitable investigations like pantographic findings, physical examination, and clinical history. After a cervical dilation of more than 4 centimeters, all vitals for the fetus and mother were assessed on a partograph. Demographic data, such as location, age, and gender, were also collected. The subjects' uterine contractions, which depicted the fetal heart rate, the status of the membranes (intact or ruptured), the volume and color of the amniotic fluid, and the regular uterine contractions that corresponded to cervical dilatation and effacement, were all assessed.

Following caesarean section, these participants and their neonates were monitored for 6 weeks, with daily check-ups on postoperative days until discharge, and then on days 15, 30, and 42. Complaints received between these evaluation days were noted and addressed appropriately.

These participants were evaluated for fetal and maternal outcomes based on a variety of characteristics. Mothers' intraoperative problems included hysterectomy, bladder damage, fetal scalp injury, traumatic PPH, atonic PPH, failed anesthesia and stomach aspiration, difficult intubation, and spinal hypotension. Thromboembolic events, spinal headache, atelectasis, postoperative fever, hematoma, rectus sheath hematoma, abdominal distension, and post-partum hemorrhage are among the acute side effects discovered up to 72 hours. Puerperal fever, lower respiratory tract infection, and urinary tract infection are examples of early problems that appear after 72 hours.

The incidence of NICU admission, APGAR score at 1 and 5 minutes, fetal weight, stillbirth, hypoxic-ischemic encephalopathy, hypoglycemia, hyperbilirubinemia, sepsis, and transient tachypnea of the infant were also measured. The research individuals were also evaluated for neonatal and maternal mortality.

The data gathered were analyzed statistically using SPSS (Statistical Package for the Social Sciences) software version 24.0 (IBM Corp., Armonk, NY, USA) for assessment of descriptive measures, Student t-test, ANOVA (analysis of variance), and Chi-square test. Pearson correlation coefficient was used to assess correlation in various parameters. The results were expressed as mean and standard deviation and frequency and percentages. The p-value of <0.05 was considered.

RESULTS

The current prospective observational study aims to analyze the indication for caesarean section in patients from Robson's group 1, estimate the incidence of fetal-maternal outcomes based on diagnostic and clinical methods, and measure other demographics in females from this group. The current study included 14048 neonates delivered by caesarean section, 3272 of whom were from Robinson Group I. The study looked at nulliparous females who were 37 weeks or older, had a singleton pregnancy, experienced spontaneous labor start, and had caesarean surgery. The most prevalent indication of caesarean delivery in research patients was meconium-stained fluid in 24.7% (n=96), followed by extensive oligohydramnios, protracted labor, placental abruption, Cervical dystocia, cephalopelvic disproportion, abnormal FHR, placenta previa, cord prolapse, and precious pregnancy were found in the research participants (Table 1).

The research participants' intraoperative maternal issues were distributed as follows: 74.74% (n=290) had no intraoperative complications. The most common intraoperative complication was atonic PPH (postpartum hemorrhage) in 10.30% (n=40) subjects, followed by traumatic PPH in 6.70% (n=26) subjects, anesthetic complications in 4.60% (n=18) subjects, bladder injury in 2.10% (n=8) subjects, hysterectomy in 1% (n=4) subjects, and fetal scalp injury in 0.50% (n=2) study subjects, respectively (Table 2).

The study findings revealed that 58.76% (n=228) of the study individuals had no acute maternal problems. The most prevalent immediate consequence was spinal headache found in 12.90% (n=50) patients, followed by abdominal distention in 10.30% (n=40) subjects, postoperative fever in 6.70% (n=26), PPH in 5.67% (n=22), Rectus sheath hematoma occurred in 2.57% (n=10) of research patients, atelectasis in 1.50% (n=6), and thromboembolic event in 1.50% (n=6) (Table 3).

There were no early maternal problems in 67.07% (n=260) of the research individuals. The most common early complication was SSI (surgical site infection) in 11.30% (n=44) subjects, followed by puerperal fever in 10.30% (n=40) subjects, UTI (urinary tract infection) in 6.70% (n=26) subjects, PPH in 2.60% (n=10) subjects, and LRTI (lower respiratory tract infection) in 2.10% (n=8) study subjects (Table 4).

In terms of fetal problems in research individuals, 35.60% (n=138) did not have any. The most common complication was hyperbilirubinemia in 19.10% (n=74) subjects followed by HIE (hypoxic ischemic encephalopathy) in 13.90% (n=54) subjects, sepsis in 12.40% (n=48) subjects, transient tachypnea in the newborn in 8.80% (n=34) subjects, hypoglycemia in 7.70% (n=30), and stillbirth in 2.60% (n=10) respectively (Table 5).

DISCUSSION

The current study included 14048 neonates delivered by caesarean section, of which 3272 were from Robinson Group I. The research looked at nulliparous females who were 37 weeks or older, had a singleton pregnancy, and had spontaneous labor beginning. They were assigned to Robson Group 1 and had caesarean surgery. The most common indication of caesarean section in study subjects was meconium-stained liquor in 24.7% (n=96) subjects followed by gross oligohydramnios, prolonged labor, placental abruption, cervical dystocia, cephalopelvic disproportion, abnormal FHR, placenta previa, cord prolapse, and precious pregnancy in 12.90% (n=50), 10.80% (n=42), 10.80% (n=42), 9.30% (n=36), 8.80% (n=34), 8.20% (n=32), 7.20% (n=28), 5.20% (n=20), and 2.10% (n=8) study subjects respectively. These findings were comparable to those of Thakur V et al⁶ in 2015 and Promila J et al⁷ in 2012, who examined participants with features similar to the current research in their separate investigations in patients with Robson Group 1. The study findings revealed that no intraoperative maternal problems were seen in 74.74% (n=290) of the study patients. The most common intraoperative complication was atonic PPH (postpartum hemorrhage) in 10.30% (n=40) subjects, followed by traumatic PPH in 6.70% (n=26) subjects, anesthetic complications in 4.60% (n=18) subjects, bladder injury in 2.10% (n=8) subjects, hysterectomy in 1% (n=4) subjects, and fetal scalp injury in 0.50% (n=2) study subjects.

These findings were consistent with the findings of Daniel S et al⁸ in 2014 and Gandhi K et al⁹ in 2017, in which the authors reported a distribution of intraoperative maternal problems similar to the current research. There were no immediate maternal problems in 58.76% (n=228) of the trial individuals. The most common immediate complication was spinal headache, which occurred in 12.90% (n=50) of the study subjects, followed by abdominal distension in 10.30% (n=40), postoperative fever in 6.70% (n=26), PPH in 5.67% (n=22), rectus sheath hematoma in 2.57% (n=10), atelectasis in 1.50% (n=6), and thromboembolic event in 1.50% (n=6).

These findings were consistent with the investigations of Baser A et al¹⁰ in 2021 and Jamwal D et al¹¹ in 2021, in which the authors observed a similar distribution of acute maternal problems in study subjects to the results of the current research.

In terms of the distribution of early maternal problems in study subjects, 67.07% (n=260) did not experience any. The most common early complication was SSI (surgical site infection), which occurred in 11.30% (n=44) of the study subjects, followed by puerperal fever in 10.30% (n=40), UTI (urinary tract infection) in 6.70% (n=26) subjects, PPH in 2.60% (n=10) subjects, and LRTI (lower respiratory tract infection) in 2.10% (n=8) study subjects, respectively.

These findings were consistent with those of Kankoon N et al¹² in 2018 and Sukmanee J et al¹³ in 2020, who also found the distribution of early maternal problems in study subjects comparable to the current study. When the occurrence of fetal complications in study subjects was examined, 35.60% (n=138) of them did not have any. The most common complication was hyperbilirubinemia in 19.10% (n=74) subjects, followed by HIE (hypoxic ischemic encephalopathy) in 13.90% (n=54) subjects, sepsis in 12.40% (n=48) subjects, transient tachypnea in newborns in 8.80% (n=34) subjects, hypoglycemia in 7.70% (n=30), and stillbirth in 2.60% (n=10), respectively.

These findings were consistent with the findings of Tognon F et al¹⁴ in 2019 and Wahane A et al¹⁵ in 2020, in which the authors' reported prenatal problems were equivalent to those of the current study.

CONCLUSIONS

Within its limits, the current study recommends that individuals in spontaneous labor should have a caesarean section only if absolutely necessary for the fetus' and mother's recovery. It is critical to intervene and minimize the rate of caesarean section, particularly in Robson group 1, which will lead to lower initial and future rates of caesarean section.

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S. No	Indications	Number (n)	Percentage (%)
1.	Precious pregnancy	8	2.10
2.	Cord prolapses	20	5.20
3.	Placenta previa	28	7.20
4.	Abnormal FHR	32	8.20
5.	Cephalopelvic disproportion	34	8.80
6.	Cervical dystocia	36	9.30
7.	Placental abruption	42	10.80

Table 1: Distribution of indications for caesarean section in study subjects

S. No	Intraoperative complications	Number (n)	Percentage (%)
1.	Fetal scalp injury	2	0.50
2.	Hysterectomy	4	1
3.	Bladder injury	8	2.10
4.	Anesthetic complications	18	4.60
5.	Traumatic PPH	26	6.70
6.	Atonic PPH	40	10.30
7.	None	290	74.74

Table 2: Distribution of intraoperative maternal complications in study subjects

S. No	Immediate complications	Number (n)	Percentage (%)
1.	Thromboembolic event	6	1.50
2.	Atelectasis	6	1.50
3.	Rectus sheath hematoma	10	2.57
4.	PPH	22	5.67
5.	Postoperative fever	26	6.70
6.	Abdominal distension	40	10.30
7.	Spinal headache	50	12.90
8.	None	228	58.76
9.	Total	388	100

Table 3: Distribution of immediate maternal complications in study subjects

S. No	Early complications	Number (n)	Percentage (%)
1.	LRTI	8	2.10
2.	PPH	10	2.60
3.	UTI	26	6.70
4.	Puerperal fever	40	10.30
5.	SSI	44	11.30
6.	None	260	67.07
7.	Total	388	100

Table 4: Distribution of early maternal complications in study subjects

S. No	Complications	Number (n)	Percentage (%)
1.	Stillbirth	10	2.60
2.	Hypoglycemia	30	7.70
3.	Transient tachypnea of the newborn	34	8.80
4.	Sepsis	48	12.40
5.	HIE	54	13.90
6.	Hyperbilirubinemia	74	19.10
7.	None	138	35.60
8.	Total	388	100

Table 5: Incidence of fetal complications in study subjects