

ORIGINAL RESEARCH

Evaluating the feto-maternal outcomes and indications of Robson's group 1 cases undergoing caesarean section

Dr. Jyothi

Assistant Professor, Department of Obstetrics and Gynaecology, Gadag Institute of Medical Sciences, Gadag, Karnataka, India

Corresponding Author

Dr. Jyothi

Assistant Professor, Department of Obstetrics and Gynaecology, Gadag Institute of Medical Sciences, Gadag, Karnataka, India

Email: drjyothipatil09@yahoo.in

Received: 09 November, 2016

Accepted: 13 December, 2016

ABSTRACT

Background: Caesarean section has increased in India in the last few decades and Robson's group 1 includes nulliparous women with a singleton pregnancy, cephalic presentation, and gestational age more than or equal to 37 weeks who go into spontaneous labor. Existing literature data is scarce concerning indications and outcomes of Robson's group 1 cases undergoing caesarean section. **Aim:** The present study was aimed to evaluate the feto-maternal outcomes and indications of Robson's group 1 cases undergoing caesarean section. **Methods:** The present study assessed 14048 neonates born by caesarean section where 3272 were from Robson Group I. The study assessed nulliparous females that were in gestation age of 37 weeks or more with the singleton pregnancy and cephalic presentation that had spontaneous labor onset allotted to Robson Group 1 and underwent caesarean section. The data gathered were analysed statistically. **Results:** Within the defined study period, 31718 deliveries were done where 14048 neonates were born from caesarean section and 3273 were from Robson's group 1. The most common indication of caesarean section in study subjects was meconium-stained liquor in 24.7% of subjects and the least common was precious pregnancy in 2.1% of subjects. The intraoperatively, most common, and least common maternal complication was atonic postpartum haemorrhage and fetal scalp injury seen in 10.3% and 0.5% of subjects respectively. The most common and least common immediate maternal complication was spinal headache and thromboembolic event seen in 12.9% and 1.5% of subjects each. The most common and least common early maternal complications were surgical site infection and lower respiratory tract infection in 11.3% and 4.1% of subjects respectively. For fetal complications, hyperbilirubinemia and stillbirths were seen in 19.1% and 2.6% of subjects respectively. **Conclusion:** The present study concludes that subjects who are in spontaneous labor must undergo caesarean section for only absolute indications for better recovery of the fetus and mother. It is vital to undergo intervention and reduce the rate of caesarean section particularly in Robson group 1 which will lead to reduced primary and further subsequent rates of caesarean section.

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

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

INTRODUCTION

Caesarean section is defined as the surgical procedure utilized for fetal delivery, membranes, and placenta utilizing a uterine and abdominal incision. It is the most commonly used major surgical procedure globally. Presently, the rate of caesarean section globally is 15% which is distributed evenly across the globe. Concerning India, in the last 2 decades, the rate of caesarean section has increased from 3% to 7% to 8.5% from 1992-93 to 1998-99, and 2005-6 respectively. An unexpected rise in caesarean section to 30% has been reported in lower respiratory tract infections from 2019-20.¹

To understand this increase and assessment of effective measures to make sure that it is not unnecessarily used, WHO proposed a tool for comparison and monitoring of rates of caesarean section in the same environment over time and in various settings, and this tool was termed Robson's classification described first in 2001 by Michael Robson and is also known as TGCS (Ten Group Classification System) used for classification of pregnant females that undergo childbirth. Pregnant females are divided into 10 groups depending on basic obstetric characteristics of previous caesarean section, number of fetuses, fetal presentation, mode of onset of

labor, gestational age, and parity. These groups are formed in a way that they are totally inclusive and mutually exclusive. The tool has been appreciated for flexibility, reproducibility, robustness, and simplicity and is recommended by WHO and FIGO in the years 2014 and 2016 for monitoring rates over time and between facilities.²

Robson's group 1 includes nulliparous females with cephalic presentation, singleton pregnancy, and gestation age ≥ 37 weeks that go to spontaneous labor. Existing literature data reports that the most common indication of the caesarean section concerning frequency is meconium-stained liquor followed by cephalopelvic disproportion, cephalopelvic disproportion, oligohydramnios, prolonged labor, cervical dystocia, placenta praevia, cord prolapse, abnormal fetal heart rate tracing, precious pregnancy and suspected fetal macrosomia.³

Intraoperative maternal complications include atonic uterus, injury to the base of the urinary bladder, and bleeding puerperal sepsis, and postoperative complications include surgical site infection, urinary tract infection, fever, rectus sheath hematoma, and haemorrhage. These complications include thromboembolic events/associated spectrum of anaesthetic and long hospital stay duration.⁴

The neonatal complications are neonatal death, NICU (neonatal intensive care unit) admission, low APGAR score, sepsis, hypoxic-ischemic encephalopathy, hyperbilirubinemia, transient tachypnoea of newborns, birth asphyxia, and stillbirth.⁵ The present study aimed to assess the indication of caesarean section in subjects from Robson's group 1, to evaluate the incidence of foeto-maternal outcomes depending on diagnostic and clinical tools, and to assess other demographics in females of this group.

MATERIALS AND METHODS

The present prospective observational study was aimed to assess the indication of caesarean section in subjects from Robson's group 1, to evaluate the incidence of foeto-maternal outcomes depending on diagnostic and clinical tools, and to assess other demographics in females of this group. The study subjects were from the Department of Obstetrics and Gynaecology of the Institute. Verbal and written informed consent were taken from all the subjects before participation.

The study assessed Robson's group 1 subjects and the inclusion criteria were nulliparous females undergoing caesarean section had singleton pregnancy, had cephalic presentation, and had gestational age ≥ 37 weeks going to spontaneous labor as Robson's group 1. The exclusion criteria for the study were subjects not in labor or had induction of labor, multiparous or multigravida females, gestational age less than 37 weeks, secondary abdominal pregnancy, pregnancy with the scarred uterus, congenital fetal anomalies, multiple pregnancies, and malpresentation.

All the included study subjects were divided into groups following Robson's classification and were allotted to Group 1 following appropriate investigations, pantographic findings, physical examination, and clinical history. Demographic data were assessed for all the subjects including locality, age, and gender. The subjects were assessed for regular uterine contractions depicting fetal heart rate, the status of the membranes (intact or ruptured), amniotic fluid assessment (volume and color), and regular uterine contractions corresponding to cervical dilatation and effacement. All vitals were assessed for fetus and mother on partograph after cervical dilation of more than 4 centimetres was achieved.

Labor duration in hours was noted. The indications for caesarean section in these subjects were documented as cord prolapse, placenta praevia, cervical dystocia, placental abruption, oligohydramnios, prolonged labor, cephalopelvic disproportion, and meconium-stained liquor. With all preoperative investigations, assurance of blood products and blood (when needed) and caesarean section was done and all intraoperative findings were recorded. After a caesarean section, these subjects and their neonates were followed for 6 weeks with daily check-ups on postoperative days till discharge and subsequently on days 15, 30, and 42. Complaints, when any, between these assessment days, were documented and entertained accordingly.

These subjects were assessed for fetal and maternal outcomes depending on different variables. Maternal outcomes were intraoperative complications including hysterectomy, bladder injury, fetal scalp injury, traumatic PPH, atonic PPH, failed anaesthesia and aspiration of gastric contents, difficult intubation, and spinal hypotension. Immediate complications are seen till 72 hours and include thromboembolic event, spinal headache, atelectasis, postoperative fever, hematoma, rectus sheath hematoma, abdominal distension, and post-partum haemorrhage. Early complications are seen after 72 hours and include puerperal fever, lower respiratory tract infection, urinary tract infection, surgical site infection, and post-partum haemorrhage.

Fetal outcomes assessed were incidence of admission to NICU, APGAR score at 1 and 5 minutes, fetal weight, stillbirth, hypoxic-ischemic encephalopathy, hypoglycaemia, hyperbilirubinemia, sepsis, and transient tachypnoea of the newborn. Neonatal and maternal mortality was also assessed in the study subjects.

The data gathered were analysed 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 present prospective observational study was aimed to assess the indication of caesarean section in subjects from Robson's group 1, to evaluate the incidence of feto-maternal outcomes depending on diagnostic and clinical tools, and to assess other demographics in females of this group. The present study assessed 14048 neonates born by caesarean section where 3272 were from Robinson Group I. The study assessed nulliparous females that were in gestation age of 37 weeks or more with the singleton pregnancy and cephalic presentation that had spontaneous labor onset allotted to Robson Group 1 and underwent caesarean section. 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 (Table 1). It was seen that for the distribution of intraoperative maternal complications in study subjects, no intraoperative complication was seen in 74.74% (n=290) subjects. Most common intraoperative complication was atonic PPH (postpartum haemorrhage) in 10.30% (n=40) subjects followed by traumatic PPH in 6.70% (n=26) subjects, anaesthetic 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 results showed that for the distribution of immediate maternal complications in study subjects, no immediate complication was seen in 58.76% (n=228) subjects. The most common immediate complication was spinal headache seen in 12.90% (n=50) subjects followed by abdominal distension in 10.30% (n=40) subjects, 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) study subjects respectively (Table 3).

For the distribution of earlymaternal complications in study subjects, no early complication was seen in 67.07% (n=260) subjects. The most common early complication was SSI (surgical site infection) seen 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 respectively (Table 4).

Concerning the incidence of fetal complications in study subjects, no fetal complication was seen in 35.60% (n=138) of study subjects. 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 tachypnoea in the newborn in 8.80% (n=34) subjects, hypoglycaemia in 7.70% (n=30), and stillbirth in 2.60% (n=10) respectively (Table 5).

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

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
8.	Prolonged labor	42	10.80
9.	Gross oligohydramnios	50	12.90
10.	Meconium-stained liquor	96	24.7

Table 2: Distribution of intraoperative maternal complications 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.	Anaesthetic complications	18	4.60
5.	Traumatic PPH	26	6.70
6.	Atonic PPH	40	10.30
7.	None	290	74.74

Table 3: Distribution of immediate 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 4: Distribution of early 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 5: Incidence of fetal complications in study subjects

S. No	Complications	Number (n)	Percentage (%)
1.	Stillbirth	10	2.60
2.	Hypoglycaemia	30	7.70
3.	Transient tachypnoea 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

DISCUSSION

The present study assessed 14048 neonates born by caesarean section where 3272 were from Robison Group I. The study assessed nulliparous females that were in gestation age of 37 weeks or more with the singleton pregnancy and cephalic presentation that had spontaneous labor onset allotted to Robson Group I and underwent caesarean section. 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 data were comparable to the studies of Thakur V et al⁶ in 2015 and Promila J et al⁷ in 2012 where authors assessed subjects with characteristics similar to the present study in their respective studies in subjects with Robson Group I. The study results showed that for the distribution of intraoperative maternal complications in study subjects, no intraoperative complication was seen in 74.74% (n=290) subjects. The most common

intraoperative complication was atonic PPH (postpartum haemorrhage) in 10.30% (n=40) subjects followed by traumatic PPH in 6.70% (n=26) subjects, anaesthetic 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. These results were consistent with the findings of Daniel S et al⁸ in 2014 and Gandhi K et al⁹ in 2017 where for distribution of intraoperative maternal complications comparable to the present study was also reported by the authors in their respective studies.

It was seen that for the distribution of immediate maternal complications in study subjects, no immediate complication was seen in 58.76% (n=228) subjects. The most common immediate complication was spinal headache seen in 12.90% (n=50) subjects followed by abdominal distension in 10.30% (n=40) subjects, 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) study subjects respectively. These findings were in agreement with the studies of Baser A et al¹⁰ in 2021 and Jamwal D et al¹¹ in 2021 where the distribution of immediate maternal complications in study subjects reported by

the authors in their studies was comparable to the results of the present study.

Concerning the distribution of early maternal complications in study subjects, no early complication was seen in 67.07% (n=260) subjects. The most common early complication was SSI (surgical site infection) seen 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 respectively. These results were in line with the findings of Kankoon N et al¹² and Sukmanee J et al¹³ where the distribution of early maternal complications in study subjects comparable to the present study was also reported by the authors in their respective studies.

On assessing the incidence of fetal complications in study subjects, no fetal complication was seen in 35.60% (n=138) of study subjects. 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 tachypnoea in newborn in 8.80% (n=34) subjects, hypoglycaemia in 7.70% (n=30), and stillbirth in 2.60% (n=10) respectively. These findings correlated with the results of Tognon F et al¹⁴ and Wahane A et al¹⁵ where fetal complications reported by the authors in their studies were comparable to the results of the present study.

CONCLUSIONS

The present study, within its limitations, concludes that subjects that are in spontaneous labor must undergo caesarean section for only absolute indications for better recovery of the fetus and mother. It is vital to undergo intervention and reduce the rate of caesarean section particularly in Robson group 1 which will lead to reduced primary and further subsequent rates of caesarean section.

REFERENCES

1. In FW, Mothers CO, Labour ID. Best practice advice on the 10-Group Classification System for caesarean deliveries. *International Journal of Gynaecology and Obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics*. 2014;135:232-3.
2. Betrán AP, Torloni MR, Zhang JJ, Gülmezoglu AM, Aleem HA, Althabe F, et al. WHO statement on caesarean section rates. *BJOG*. 2010;123:667.
3. Robson MS. Classification of caesarean sections. *Fetal and maternal medicine review*. 2001;12:23-39.
4. Betrán AP, Merialdi M, Lauer JA, Bing-Shun W, Thomas J, Van Look P, Wagner M. Rates of caesarean section: analysis of global, regional and national estimates. *Pediatric and perinatal epidemiology*. 2007;21:98-113.
5. Abubeker FA, Gashawbeza B, Gebre TM, Wondafrash M, Teklu AM, Degu D, et al. Analysis of caesarean section rates using Robson ten group classification system in a tertiary teaching hospital, Addis Ababa, Ethiopia: a cross-sectional study. *BMC Pregnancy and Childbirth*. 2013;20:1-7.
6. Thakur V, Chiheriya H, Thakur A, Mourya S. Study of maternal and fetal outcome in elective and emergency caesarean section. *Emergency*. 2015;2521:78-37.
7. Promila J, Harneet K, Vidushi B, Annika J. A comparison of maternal and fetal outcomes in elective and emergency caesarean section. *Indian Obstetrics and Gynaecology*. 2012;2:3.
8. Daniel S, Viswanathan M, Simi BN, Nazeema A. Study of maternal outcome of emergency and elective caesarean section in a semi-rural tertiary hospital. *National Journal of Medical Research*. 2014;4:14-8.
9. Gandhi K, Dahiya K, Gandhi K. Maternal and neonatal outcome in 1000 caesarean sections. *International J Healthcare Biomed Res*. 2016;5:123-34.
10. Baser A, Sharma S, Kumar S, Sabu A, Shaikh SS. Indication for Caesarean Section as per Robson's Criteria: An Analysis of 5000 Consecutive Caesarean Cases. *Journal of South Asian Federation of Obstetrics and Gynaecology*. 2015;13:23.
11. Jamwal D, Sharma P, Mehta A, Pannu JS. Analysis of caesarean sections using Robson's classification system in a tertiary care center in Northern India: an emerging concept to audit the increasing caesarean section rate. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*. 2012;10:2281-6.
12. Kankoon N, Lumbiganon P, Kietpeerakool C, Sangkomkarn U, Betrán AP, Robson M. Caesarean rates and severe maternal and neonatal outcomes according to the Robson 10-Group Classification System in Khon Kaen Province, Thailand. *International Journal of Gynecology & Obstetrics*. 2014;140:191-7.
13. Sukmanee J, Liabsuetrakul T, Peeyanjarassri K. Rates and Indications of Caesarean Section Using the Robson Classification in a University Hospital in Southern Thailand 2014-2016. *Journal of Health Science and Medical Research*. 2013;38:307-19.
14. Tognon F, Borghero A, Putoto G, Maziku D, Torelli GF, Azzimonti G, Betran AP. Analysis of caesarean section and neonatal outcome using the Robson classification in a rural district hospital in Tanzania: an observational retrospective study. *BMJ open*. 2014;9:e033348.
15. Wahane A, Ghaisas AS. Analysis of caesarean sections according to Robson's criteria at a tertiary care teaching hospital in central India. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*. 2012;9:4221-6.