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Retrospective clinical study on analysis of primary caesarean section rate using Robsons criteria in an urban post graduate teaching institute in Salem, Tamil Nadu, South India

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Abstract
Background: Caesarean section saves maternal and infant lives when vaginal delivery pose risk to life of the mother and the baby but when performed without a medical need it exposes mother and baby to unnecessary short and long term risk. According to the new research from WHO caesarean section rate is rising globally for more than 1 in 5 (21%) of all births. The purpose of this study is to analysis signal of caesarean section and audit the rate by using Robsons Criteria.
Materials and Methods: A Retrospective analytical study was conducted at the department of obstetrics and gynecology at Arokya Womens Centre, Salem, Tamil Nadu, and South India. The study period was from June 2024 to May 2025. All cases of LSCS and their indications were analysed and audited using Robsons Criteria. Details are obtained from case sheets, OT register, parturition record and new born register of 542 patients who underwent caesarean section.
Results: Out of 3156 institutional deliveries, LSCS was 542 and 2614 was labour natural. The incidence of caesarean section rate was 17.1%.Primary caesarean section was 253. The incidence of primary caesarean section rate was 8.01%. The highest contribution was Group 5 and Group 2 by analyzing from Robson criteria. The lowest contribution was Group 4. The most common indications were previous LSCs with CPD and fetal distress.
Conclusion: From this study, we conclude that primary caesarean rate is 8.01% in our hospital which is within WHO guidelines. Previous LSCS and fetal distress contributes to greater numbers. Careful FH monitoring, expediting labour using instrumental delivery and promoting TOLAC can be done to reduce CS rates in those categories.

Keywords: Robsons criteria, primary caesarean, indications, primary section rate

Introduction
Caesarean section is one of the oldest operations in surgery. Its development and application has saved lives of countless mothers and infants [1]. Munro kerr was largely responsible for the change from classical incision back to the low transverse incision [1]. Introduction of anesthesia, advancements in surgical technology, improvements in blood transfusion, antibiotics, and thromboprophylaxis have enhanced perioperative protection [1]. The CS rate of up to 10-15% is associated with a decrease in maternal, neonatal and infant mortality [2]. Above this level is no longer associated with reduced mortality rate.
In 2000 Lucas *et al.* [3] proposed a new classification based on clinical definitions which uses 4 categories of urgency without specific time constraints. WHO proposes robsons classification system [4] as global standard for assessing, monitoring and comparing CS rate within health care facilities over time and in between facilities [5]. The rates of Caesarean section worldwide have increased from about 7% to 21% between 1990 to today, if this trend continuously, the highest rate by 2030 is the highest rate of East Asia (63%), Latin America and Caribbean (54%), West Asia (50%), North Africa (48%), South Europe (47%), Australia and New Zealand (45%) [6].
According to the study, trends and projections of caesarean section rates: global and regional estimates from 1990-2018 from 154 countries estimated CS rate in Africa 9.2%, Asia 23%, Europe 25.7%, Americas 39.3%, Oceania 21.4%, world total 21.1% [7]. The reasons for this increase are multifactorial, increase in multifetal gestation, use of intrapartum electronic fetal monitoring, medicolegal concerns, parental and societal expectations of pregnancy outcome and maternal decision making [8].

In addition, a new category that has emerged in the last decade and mainly features maternal requests [9] that non-clinical intervention begins to educate women, which promotes physical activity and regular exercise, due to anxiety and labor fear. Workshops should be organized to inform them about the advantages, disadvantages, signals and contraindications of caesarean section and vaginal distribution [10].

Materials and Methods

It is a retrospective analytical study conducted at Arokya Women's Centre, Salem, Tamil Nadu, from June 2024 to May 2025. 542 caesarean deliveries were audited from the case sheets, OT register, parturition record, and newborn register. Total LSCS, primary and repeat LSCS were calculated by the number of LSCS in a year divided by the total number of deliveries. The percentage was calculated accordingly.

All patients who were delivered by caesarean section were included in the study and categorised according to Robson's criteria (Table 2). For each patient, details such as name, age, inpatient number, address, obstetric score, gestational age, induction status (spontaneous or induced), comorbidities, indication for lower segment caesarean section (LSCS), and outcome were recorded. Patients who underwent operative vaginal delivery, as well as those who had preterm or term vaginal deliveries, were excluded from the study.

Results

According to the demographic analysis in Table 1, most of the patients were between the ages of 21 and 30 (76.9%), followed by those between the ages of 31 and 40 (20.6%). Only a tiny number of patients were younger than 20 (1.4%) or older than 40 (0.5%). The majority of patients were multiparous (64.0%), whereas primiparous women represented 35.9% of the cases. The distribution of caesarean sections by type was nearly identical, with emergency LSCS at 50.1% and elective LSCS at 49.8%.

Table 1: Demographic Variables

Variables		No of Cases	Percent
Age	<20	8	1.4
	21-30	417	76.9
	31-40	112	20.6
	41-45	3	0.5
Parity	Primi	195	35.9
	Multi	347	64.0
Type of LSCS	Emergency	272	50.1
	Elective	270	49.8

Table 2: Robsons Criteria

Group	Description
1	Nulliparous, singleton, cephalic, full-term, spontaneous labour.
2	Nulliparous, singleton, cephalic, full-term, induced labour or prelabour caesarean section.
3	Multiparous, singleton, cephalic, full-term, without a previous caesarean section, spontaneous labour.
4	Multiparous, singleton, cephalic, full-term, without a previous uterine scar, induced labour or prelabour caesarean section.
5	Multiparous, singleton, cephalic, full-term, with a previous caesarean section.
6	Nulliparous, singleton, breech.
7	7 Multiparous, singleton, breech.
8	Multiple pregnancy (twins or higher-order multiples).
9	Singleton, transverse or oblique lie.
10	Singleton, cephalic, preterm.

According to Robson's criteria, Table 3 demonstrated how the LSCS rate was spread out throughout the groups. Group 5 contributed the most, making up 42.9% of all caesarean deliveries and 7.3% of the overall CS rate. Groups 2 and 10 came in second and third, respectively, with 3.3% and 19.3% and 2.1% and 12.3%. The relative contributions of Groups 1 and 6 to the overall rate were 1.1% and 1.0%. The groups that contributed the least were 3, 4, and 9. This pattern showed that nulliparous women with induction or pre-labor CS (Group 2) and past caesarean pregnancies (Group 5) were significant contributors to the LSCS rate, indicating priority areas for focused interventions.

Table 3: LSCS Rate among groups according to Robsons criteria

Group	Contribution made by each group to overall CS rate (17.1%)	Relative contribution made by each group for CS (N=542)
Group 1	1.1% (36/3156)	6.6% (36/542)
Group 2	3.3% (105/3156)	19.3% (105/542)
Group 3	0.2% (8/3156)	1.4% (8/542)
Group 4	0.1% (6/3156)	1.1% (6/542)
Group 5	7.3% (233/3156)	42.9% (233/542)
Group 6	1.0% (34/3156)	6.2% (34/542)
Group 7	0.5% (18/3156)	3.3% (18/542)
Group 8	0.6% (20/3156)	3.6% (20/542)
Group 9	0.4% (15/3156)	2.7% (15/542)
Group 10	2.1% (67/3156)	12.3% (67/542)

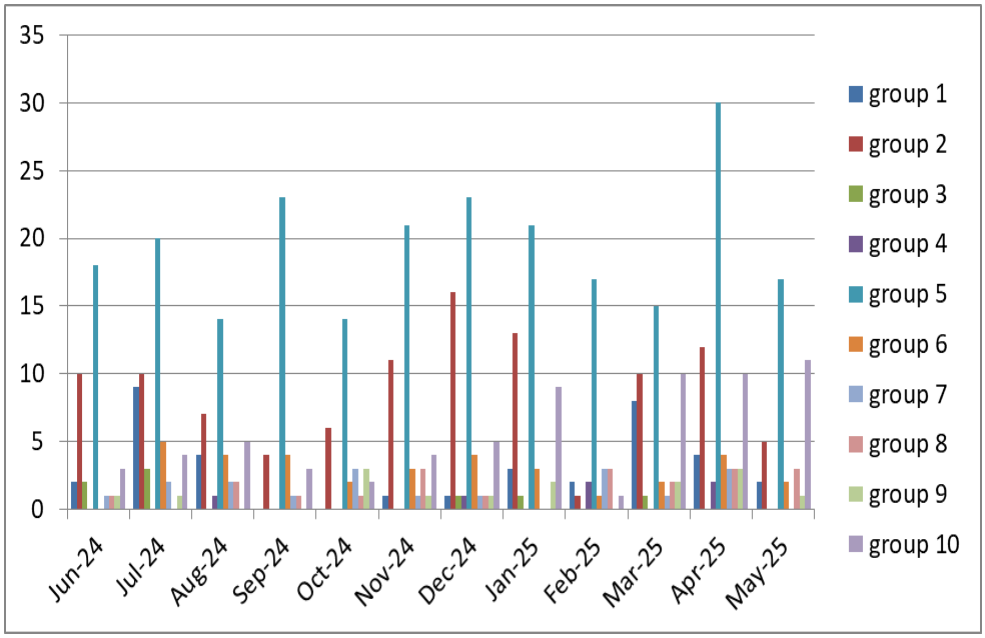

Fig 1: Distribution of caesarean section cases according to Robson's ten-group classification, showing the highest contribution from Group 5, followed by Groups 2 and 10, while Groups 3, 4, and 9 contributed the least

Table 4 revealed that 2,614 (82.8%) of the 3,156 deliveries were vaginal, whereas 542 (17.1%) were caesarean sections. While repeat caesarean sections among women who had previously had LSCS accounted for 9.1% (289 cases), the original caesarean section rate was 8.01% (253 cases). This showed that primary procedures accounted for over half of the caesarean deliveries, with repeat sections accounting for the remaining portion. Women having a history of prior LSCS contributed significantly to the overall caesarean rate, highlighting the necessity of tactics such encouraging trial of labour after caesarean (TOLAC) in order to potentially lower the likelihood of repeat caesarean sections.

Table 4: Incidence and type of caesarean section

Variables		No of Cases	Percent
Incidence of Caesarean Section	No of caesarean section	542	17.1
	No of vaginal delivery	2614	82.8
	Total deliveries	3156	100.0
Primary Caesarean Section Rate	Primary section	253	8.01
	Previous LSCS	289	9.1
	Total	542	17.1

Discussion

Caesarean section is the delivery of an infant, alive or dead, through an abdominal uterine incision after the period of viability [9]. The incidence of caesarean section is rising in most parts of the world. Major increase has been in low risk women for failure to progress, abnormal fetal heart rate patterns and repeat caesarean sections. Maternal morbidity and mortality after caesarean birth is significantly higher than vaginal delivery [9]. Robsons classification is perhaps the best to audit the caesarean rates in low risk and high risk groups [4].

Groups were analysed according to Robsons Criteria and the primary section rate in present institute is 8.01% which is well within WHO guideline. In our current study, major contributors of CS were group 5, group 2 and group 10. The least contributor was group 4.

Group 5 was the highest contributor to LSCS in the present study, accounting for 7.3%. The observed reason for this was the fear among women of complications such as uterine rupture, scar dehiscence, and labour pain, leading them to avoid undergoing a trial of labour after caesarean (TOLAC). Other studies, such as those by Nafeesa Farheen SK *et al.* [11] and Ramandeep Bansal *et al.* [12], have also identified Group 5 as a major contributing factor, reporting rates of 80% and 25.3% respectively, which are comparatively higher than in our study. Women should be educated and counselled during their antenatal visits about the safety and benefits of TOLAC to help alleviate their fears.

Group 2 was the second highest contributor, accounting for 3.3%, and the most common indication was fetal distress, which was due to a prolonged labour process. Most studies had highlighted this group as a major contributor to the high caesarean rate. Studies such as Priya Shankar *et al.* [13] reported Group 2 at 19.2%, Ramandeep Bansal *et al.* [12] at 12.7%, and Nafeesa Farheen SK *et al.* [11] the highest at 62.5%. Careful fetal heart monitoring, expediting labour, and using instrumental delivery were suggested measures to reduce this rate. Induction was advised only in indicated cases with a favourable Bishop score to avoid prolonged labour and fetal distress.

Group 10 is the third contributor accounting for 2.1%. The most common reason is pregnancy by ART techniques which is the emerging cause for the increase in CS rate in this group. The observed reason was due to patients' reluctancy to accept the risk of vaginal delivery and go for elective section. Apart from this reason the associated co morbidities also plays a part. Other causes are Doppler changes in conditions like severe pre-eclampsia, chronic hypertension superimposed severe pre-eclampsia, women with uncontrolled sugars which pose threat to the life of fetus.

Conclusion

From this study, we conclude that overall caesarean rate is 17.1% and vaginal delivery is 82.8% while primary caesarean rate is 8.01% in our hospital which is within WHO guidelines. Most common indication for primary section is fetal distress where careful FH monitoring, expediating labour using instrumental delivery can be done to reduce it. Among the indications previous LSCS is high (9.1%) which should be reduced by giving more TOLAC. Finally, Robsons Criteria plays a major role to evaluate and schematize the group that throws in to the most to the caesarean section rate and helps us to remodel and plan to reduce it and helps in reducing maternal morbidity and mortality.

Conflict of Interest

Not available

Financial Support

Not available

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