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Original Research Article

ANALYSIS OF CAESAREAN SECTION RATES BY AUDITING ROBSON'S TEN GROUP CLASSIFICATION; A SINGLE CENTRE APPROACH

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ABSTRACT

Background: The rate of caesarean section is rising day by day and it has become a major health concern. Caesarean section is associated with both maternal and perinatal morbidity and mortality for present and future pregnancies. So, an audit of caesarean section is very important for analysing the indications for caesarean section and make recommendations for decreasing caesarean delivery rates. Robsons ten group classification system analyses the caesarean section rates and allow us to bring changes in our practice. **Materials and Methods:** This was a cross-sectional study conducted in al Azhar medical college, Thodupuzha, Idukki, Kerala. a single hospital from march 2024 to march 2025, study population included 739 pregnant women, in that 348 underwent caesarean section and they were grouped according to Robsons ten group classification system after collecting data and analysed. **Result:** Out of 348 women who underwent caesarean section the overall caesarean section rate was 47.09%.and according to Robsons 10 group classification system after grouping, group 5 (previous LSCS) had the maximum contribution followed by group 2 (nulliparous >37 weeks, induced) they contributed 33.33% and 26.15% respectively. The most common indication for caesarean section was previous LSCS followed by foetal distress flowed by meconium-stained liquor which was 37.93%,19.25%,13.22% respectively. **Conclusion:** Defining optimal caesarean section rate in any setting won't be realistic due to different health status of patients. Robson's ten group classification system helps in auditing the caesarean section rates and helps us to analyse the major contributor of increasing caesarean section rates. Group 5 and group 2 contributed the maximum caesarean section rates .it is important to individualise every labour, and offering TOLAC for women with previous Lscs after proper patient selection and counselling regarding risks and benefits. The same time changing the norms for nonprogession of labour, proper training for obstetricians for CTG interpretation in case of foetal distress, trying amnioinfusion for meconium-stained liquor and encouraging obstetricians to perform versions when not contraindicated can reduce the cs rates.

INTRODUCTION

The rate of cesarean section is increasing worldwide and it is always going beyond who recommended rate of 15% for all deliveries.[1] but increased cesarean section rate > 16% does not reduce maternal and neonatal mortality.[2,3] At the same time there is increased chance of placenta accreta, retained placenta and uterine rupture with chances of peripartum hysterectomy when number of cesarean sections increases.[4-6]

The factors responsible for increase in the cesarean section rates are maternal characteristics, socio economic and medicolegal causes and malpractice.[7] Other common factors include maternal request, hospital system factors, type of care provided by insurance and finally obstetrician's choice. All these factors are very complicated and non-separable.[8]

Recent national family health survey (NFHS-5, 2019-2021) states that the cesarean section rate in India was increased from 17.2% to 21.5%. in many other parts of country, the rate of cesarean section was high such as in Telangana it is 60.7% and in Tamil Nadu it is 38.8% and in Kerala it is 42.4%. the lowest cesarean section rates found in Nagaland and it is 5.2%.[9]

There are so many classification systems but there is no internationally accepted standardized classification system for comparison and monitoring of cesarean section rates. And those were not very

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useful for change in clinical practice as the indications were not identifiable prospectively.[10]

In April 2015 WHO proposed Robson's ten group classification system (RTGCS) as a standard tool for assessing, monitoring and comparing the cesarean section rates between countries.[10] In that classification following parameters were used; gestational age, parity, presentation and number of gestations, onset of labor.

So, in this study we try to find out the major cause for increasing cesarean section rate by classifying the various indication for cesarean section under Robsons ten group classification system and identify various methods by which the rates could be possibly reduced.

MATERIALS AND METHODS

It is a single hospital based cross sectional study carried out at AL Azhar Medical College, Thodupuzha, Idukki, Kerala from march 2024 to march 2025.Study population comprised of all pregnant women admitted in the department of OBG, al Azhar medical college during the study period. All pregnant women were included in study after getting institute ethical committee approval. Written and informed consent was obtained from all patients and after getting relevant history and taking relevant information from case records from case sheet, written proforma was made and classified in Robsons ten group classification system. The overall caesarean section rate was calculated and the major contributing factor was identified. The contribution of each group to caesarean section rate was calculated, The classification as follows:

Robson's Ten Group Classification System

1. Nulliparous single cephalic,> 37 weeks in spontaneous labour
2. Nulliparous single cephalic > 37 weeks, induced or cs before labour.
3. Multiparous (excluding previous cs), single, cephalic, >37 weeks in spontaneous labour
4. Multiparous (excluding previous cs), single, cephalic, >37 weeks, induced or cs before labour
5. Previous c s, single, cephalic,>37wks
6. All nulliparous breeches
7. All multiparous breeches (including previous CS)
8. All multiple pregnancies (including previous CS)
9. All abnormal lies (including previous CS)
10. All single, cephalic, <36 weeks (including previous cs)

The overall all caesarean section rates, major contributing factor and contribution to each group to caesarean section rate was calculated.

Study variables

1. Age
2. Parity (nulliparous and multiparous)
3. History of previous caesarean section
4. Gestational age (≥37 weeks, <37 weeks)
5. Presentation (cephalic /breech/transverse lie)
6. Onset of labour (spontaneous/induced), in induced -indication of induction)
7. Number of gestation (single /multiple)
8. Elective emergency and its indication
9. Complications of caesarean section
10. Neonatal variables (Birth weight, Apgar score, Nicu admission)

Data collection: All data were entered into excel (MS excel 2011). privacy and confidentiality were maintained. all patient identifiable numbers and information's was stripped off and replaced by anonymous numbers.

RESULTS

During the study period the total number of patients were 739 and in those 348 patients had caesarean section and 357 live births in 348 caesarean sections. The caesarean section rate during the study period was 47.09%

Table 1: Age and parity

Age	No. of mothers	%
<20	6	1.72
20-24	106	30.46
25-29	160	45.99
30-34	66	51.96
35-39	10	2.87
Total	348	100
Parity		
Primigravida	176	50.57
Multigravida	172	48.9
Total	348	100

In 348 women who underwent cs were between the age group of 18-39 years. maximum number of women aged between 30-34 years. And in case of parity 50.57% of cs patients were nulliparous and 49.43% were multiparous. [Table 1]

Table 2: Gestational age /Gestation

Gestational age	No of mothers	%
Preterm	62	17.82
Term	286	82.18

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Total	348	100
Gestation		
Singleton	336	96.55
Multiple	12	3.45
Total	348	100

In 348 patients who underwent caesarean section 82.18% were term patients and 17.82% patients were preterm. In this study 96.55%patients were singleton pregnancies and only 3.45% were multiple pregnancies. [Table 2]

Table 3: Robson's classification

Robson's classification	No. of mothers	%
Group 1	45	12.93
Group 2	91	26.15
Group 3	16	4.6
Group 4	10	2.87
Group 5	116	33.33
Group 6	11	3.16
Group 7	10	2.87
Group 8	10	2.87
Group 9	2	0.6
Group 10	37	10.63
Total	348	100

Out of 348 women who had caesarean section were classified according to RTGCS (table 3). the maximum contributing group was group 5 which is women with previous LSCS underwent repeat cs. group 5 had 33.33% of total caesarean section rates. The second highest contributor was group 2 that was nulliparous women >37 weeks and induced labour. And that group had 26.15% of overall caesarean section rates. The least % of contribution was from group 9 which was abnormal lie which had only 0.6% of overall caesarean section rates. [Table 3]

Table 4: type of onset of labour / indications for CS

Onset	No of mothers	%
Spontaneous	196	56.32
Induced	114	32.76
Elective	38	10.92
Total	348	100
Indications for LSCS		
Previous LSCS	132	37.93
Foetal distress	67	19.25
Msl	46	13.22
Breech	28	8.05
CPD	23	6.60
Failed induction	23	6.60
NRFHR	16	4.6
Arrest of dilatation	4	1.15
Abruptio placenta	4	1.15
Central placenta previa	2	o.57
Occult cord prolapse	1	0.29
Transverse lie	1	0.29
Unstable lie	1	0.29
Total	348	100

Out of 348 women 310 were emergency caesarean section (89.08%) and 38 were elective caesarean section (10.92%).and in 310 women 56.32% presented with spontaneous onset of labour and 32.76% with induced labour.

The common indication for caesarean section was previous LSCS not willing for TOLAC which was 37.93% and second most common indication was foetal distress which contribute to 19.25% followed by meconium-stained liquor which was 13.22% [Table 4]

Table 5: complications

Complications	No of mothers	%
Yes	12	3.45
No	336	96.55
Total	348	100

Out of 348 who underwent caesarean section 96.55% had no complication and 3.45 % had complications like postpartum eclampsia, PPH, blood transfusion. and the common complication was PPH. [Table 5]

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Table 6: birth weight of babies /Apgar score / Nicu admission

Birth weight	No of babies	%
1000-2000gm	20	5.60
2001-3000gm	183	51.26
3001-4000gm	149	41.74
4001-5000gm	5	1.4
Total	357	100
Apgar score		
Score 1	336	94.1
Score 2	21	5.9
Total	357	100
Nicu admission		
Yes	58	16.2
No	229	83.8
Total	357	100

357 live babies including multiple pregnancy were delivered out of 348 LSCS. The maximum number of babies weighed between 2000-3000gm which was 51.26% .94.1% had Apgar score 9/10 and 5.9% had Apgar score of <8/10.out of 357 live babies 16.2% babies had Nicu admissions. The most common cause was preterm birth followed by respiratory distress and grunting. [Table 6]

DISCUSSION

According to WHO there is no justification for caesarean section rate more than 10-15%in any region.[11] Despite the increase there is no maternal and perinatal benefits and at the same time so many studies shown that it is associated with negative consequences in maternal and neonatal health.[12] But caesarean section rates increases worldwide and has become a major and controversial health concern.[13] So national maternity hospital in Dublin introduced the Robson's ten group classification system for analysing the caesarean sections.

In the present study 348 women underwent caesarean section and in that group 5 was the maximum contributor which was previous caesarean section and the rate was 33.33% similarly Jacob et al found that maximum contribution from group 5 which was 61.5% and overall caesarean section rate was 30.8%.[14] Similarly Zimmo MW et al, Kant et al , ray et al, Jogia PD et al also found that maximum contribution from group 5.[15-18] From above finding we can see that TOLAC is widely advocated but not following properly and the reason for this can be multifactorial ranging from patient refusal to fear of doctors for complications and poor facilities.

In our study second major contribution was from group 2 which was 26.15% and the most common indication for cs in this group was foetal distress which was 19.25% and meconium-stained liquor which was 13.22%. similarly ray et al in their study also found that group 2 had the second most common indication for caesarean section which was 4.93% but the indication for caesarean section was non reassuring foetal heart rate and nonprogession of labour17.similarly Prabhavathi et al also found that group 2 had increasing trend of caesarean section rates.[19]

In our study, group 1 and group 3 had 12.93% and 4.6% to overall caesarean section rates. The indication for cs were foetal distress, NRFHR and CPD. Similarly, Yadav et al, Tura AK et al and Mbaye et al also had similar results. According to Yadav et al group 1 had 37.6% to overall cs rates and group 3 had 15%. according to Tura AK et al group 1 had 19.3% and group 3 had 21.3%.and according Mbaye et al group 1 had 34.2 % of caesarean section rates .in that main indication was CPD and foetal hypoxia.[20-22] Group 1 and group 3 is patients who present in spontaneous labour and these groups should have lower caesarean section rates and high chance of vaginal delivery but in recent times nonreassuring foetal heart rate pattern is the indication for caesarean section and increased use of electronic foetal heart rate monitoring and less training in proper interpretation of CTG report plays the major role.

In our study group 6 and 7 were contributing only 3.16% and 2.87%. these results were similar to Ray et al and Dhodapkar et al. According to Ray et al group 6 and 7 contributed 2.4% and 1.2%and Dhodapkar et al states that group 6 and 7 contributed 8.1% to overall cs rate.[17,23] The rise in caesarean section in this groups were due to lack of assisted breech delivery and external versions which are no longer done due to lack of knowledge and regular practice. All breech presentations are indications for caesarean section due to fear of neonatal morbidity associated with assisted breech delivery.

In our study group 9 contributed 0.6% of total caesarean section rate which was almost 100 % in this study. Similar results were reported by Ray et al, Jogia et al, Dhodapkar et al, Bolognani et al and Yadav et al.[17,18,20,23,24]

In our study group 10 had 10.63% of overall cs rates and Dhodapkar et al concluded that 7.3% had caesarean section in group 10. But according to Zimmo et al, they had 34 % to overall cs rate in group 10 which was above the cut off and it happened due to large number of women referred to tertiary centre for better NICU facilities.[15,23]

In this study group 4 and group 8 contributed only 2.87% each of overall caesarean section rate and

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according to Litorp et al they reported that group 4 had highest increase from 26% to 91% in a study done in 2000 and 2011 at Tanzania national hospital and this may be due to local tradition of low induction rate and more caesarean section before labour and relatively smaller study group. But Zimmo et al concluded 68% had caesarean section in group 8 and they summarised that the increase in rate is due to twin pregnancies conceived by in vitro fertilization and they asked for LSCS.[23,25]

In our study the commonest indication was previous LSCS which contributed 37.93% followed by foetal distress (19.25%), MSL (13.22%), breech (8.05%) and failed induction and CPD (6.60%) each. Similarly, Ray et al, Prabhavathi et al, Yadav et al also found that previous lscs is the most common indication.[17,19,20]

Another common indication was meconium-stained liquor which contributed 13.22% of total caesarean section. Sasikala et al in their study concluded that those hospitals with limited facilities for electronic foetal heart monitoring, amnioinfusion might reduce the incidence of caesarean section rates.[26]

In our study incidence of PPH and blood transfusion was 3.2% similarly Magann EF et al concluded that emergency caesarean section had increased risk of PPH when compared to elective LSCS.[27]

Out of 357 babies 51.26% babies weighted between 2-3 kg and 41.6% babies between 3-4kg and only 5.9% between 1-2 kg. And 6.1% babies had APGAR score <than 8/10 and 16.2% babies got admitted in NICU. The most common indication for NICU admission was preterm. Though foetal distress and meconium-stained liquor which was 19.25% and 13.22% had contributed indication for caesarean section, those were not the indication for NICU admission. Similarly, Gangwar et al in his study concluded that foetal distress is a poor predictor for neonatal outcome as decision for LSCS is taken earlier before serious foetal compromise occur and it lead to unnecessary caesarean sections.[28]

Limitation

The major limitation of the study was Robson's ten group classification system does not classify the caesarean section for major conditions like major degree placenta previa and maternal request as the incidence of indication like maternal request increases now a days.

CONCLUSION

This Present study on the caesarean section analysis was done using Robson's ten group classification system. in that group 5 and group 2 were the major contributing groups. And the most common indication for primary caesarean section was foetal distress and meconium-stained liquor.

After analysing the caesarean section rates in our hospital ,trial of labour after caesarean section for previous lscs patients who are willing for vaginal delivery with close maternal and neonatal monitoring can bring down the rate of repeat caesarean section.at the same time the most common indication for primary caesarean section was foetal distress, so it is important to all practicing obstetricians to get trained in interpreting cardiotocography and promote assisted breech delivery and external cephalic version which can reduce the number of primary caesarean section.

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