ANALYSIS OF INCREASING CAESAREAN SECTION RATES USING 10 GROUP CLASSIFICATION SYSTEM
Bama Ramesh1, Vidya Ravi2, Archana H. K3

1Professor & HOD, Department of Obstetrics & Gynaecology, KAPV Government Medical College, Trichy.
2Professor, Department of Obstetrics & Gynaecology, KAPV Government Medical College, Trichy.
3Junior Resident, Department of Obstetrics & Gynaecology, KAPV Government Medical College, Trichy.

ABSTRACT

INTRODUCTION
At present, there is no accepted classification system for CS. Caesarean section rates have been analysed by comparing overall rates, by indication for caesarean section, by subgroups of women, and primary and repeat CS rates; all of which have their disadvantages. The international health care community has considered 10%-15% as the ideal rate for caesarean sections since the 1980s. However, caesarean section rates continue to increase in both developed & developing countries.

AIM
Analysis of caesarean deliveries by using Robson’s criteria, including primary vs. repeat CS and potential reasons of these, and to provide insights into the solution for reducing overall caesarean rates.

MATERIALS AND METHODS
Retrospective study for a period of six months from June 2015 to December 2015 at KAPV Government Medical College, a tertiary care hospital in Trichy. Ten group classification system- this classification system is used in single institutional studies, jurisdictional, national registries and recently with international studies.

RESULTS
The total number of women delivered for the period of six months was 5522, out of which caesarean deliveries were 2917. Group two (Nulliparous, single, cephalic, > 37 weeks’ induced) made greatest contribution to total caesarean rates. Group five (Previous CS, single, cephalic, > 37 weeks) contributed to second in the total caesarean rates. Results should be described still more relevantly.

MATERIALS AND METHODS
Retrospective study for a period of six months from June 2015 to Dec 2015 at KAPV Government Medical College, a tertiary care hospital in Trichy. Ten group classification system- this classification system is used in single institutional studies, jurisdictional, national registries and recently with international studies.

RESULTS
There has been an increasing trend in the number of caesarean sections over the last six years (2173 in 2010 vs. 4801 in 2015). There was 52.6% of caesarean sections during the study period (June 2015 to December 2015). Most of the caesarean sections (28.1%) were for a primiparous mother with a singleton in cephalic presentation. Repeat caesarean section formed 12.2%. The overall caesarean section rates is 52.6% in par with Indian standard.

CONCLUSION
An internationally accepted classification must be implemented in all units. Measures to avoid unnecessary caesarean section are best founded on evidence based guidelines and quality standards. Caesarean section can be reduced by optimal management in labour, appropriate use of augmentation, correct interpretation of foetal heart rate monitoring, senior obstetrician involvement in decision making and use of confirmatory tests where foetal compromise is suspected.

KEYWORDS
Caesarean Section, Robson’s Classification, 10 Group System.

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INTRODUCTION:
Caesarean section rate are not homogenous in nature. It has to be analysed in a standard way to determine whether they are actually appropriate or not. Caesarean section audit, including relevant outcomes, should be implemented before contemplating strategy to reduce caesarean section rate.
There is a very poor routine data collection regarding child birth, especially about caesarean sections, considering the interest and the strong reaction caesarean section rate provoked. Justification for a caesarean section is difficult to prove, in terms of economy, maternal satisfaction and foetal and maternal morbidity.

The number of caesarean section can easily be arrived at, but indication is no difficult to standardise. The data collection should be more accurate and the outcomes has to carefully defined, ultimately it is not CS rate itself that is the final measurable outcome but the short-term and long term effect that a CS may have on mother and baby.

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At present, there is no accepted classification system for Caesarean section. Caesarean section rates have been analysed by comparing overall rates, by indication for caesarean section, by subgroups of women, and primary and repeat Caesarean section rates; all of which have their disadvantages.

The international health care community has considered 10%-15% as the ideal rate for caesarean sections since the 1980s. However, caesarean section rates continue to increase in both developed & developing countries.[1]

There is no evidence showing the benefits of caesarean delivery for woman or infants who do not require the procedure. Mortality related to caesarean section - 5%. Morbidity related to caesarean section – 15%. [2][3]

**ROBSON'S 10 GROUP CLASSIFICATION:** It is an internationally accepted classification. The 10 group classification makes it possible to compare caesarean section rates over time in one unit and between different units. Each of the ten groups can and should be further subdivided when indicated. The indications for caesarean section should be specifically defined within each group of women because the definition and the management will vary in each group of women and will have different risk-benefit ratio.

Therefore, assuming that there is a belief that caesarean section rate was too high, and also assuming that all the other information required is available, including outcome and maternal satisfaction, then the 10 groups can be used to assess any caesarean section rate and in particular compare with other lower or higher caesarean section rates either within the same delivery unit from previous years, or with other delivery units elsewhere.

In terms of CS rates, the most important areas of management to assess are ensuring foetal wellbeing and efficient uterine action in labour, together with auditing the indications for induction and pre-labour CS. Indications for CS in labour should be classified into foetal or dystocia.

**The variables used are:**

1. Single or multiple pregnancy.
2. Nulliparous, multiparous, or multiparous with a previous CS.
3. Cephalic, breech presentation or other malpresentation.
4. Spontaneous or induced labour.
5. Term or preterm births.

It helps to study the cause of increasing caesarean rates.[4][5]

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nullipara, singleton cephalic, ≥37 weeks, spontaneous labour</td>
</tr>
<tr>
<td>2</td>
<td>Nullipara, singleton cephalic, ≥37 weeks, A: Induced, B: Caesarean section before labour</td>
</tr>
<tr>
<td>3</td>
<td>Multipara, singleton cephalic, ≥37 weeks, spontaneous labour</td>
</tr>
<tr>
<td>4</td>
<td>Multipara, singleton cephalic, ≥37 weeks, A: Induced, B: Caesarean section before labour</td>
</tr>
<tr>
<td>5</td>
<td>Previous Caesarean section, singleton cephalic, ≥37 weeks, A: Spontaneous labour, B: Induced labour, C: Caesarean section before labour</td>
</tr>
<tr>
<td>6</td>
<td>All multiparas, A: Spontaneous labour, B: Induced labour, C: Caesarean section before labour</td>
</tr>
<tr>
<td>7</td>
<td>All nulliparous breeches, A: Spontaneous labour, B: Induced labour, C: Caesarean section before labour</td>
</tr>
<tr>
<td>8</td>
<td>All multiple pregnancies, A: Spontaneous labour, B: Induced labour, C: Caesarean section before labour</td>
</tr>
<tr>
<td>9</td>
<td>All abnormal lie (including previous Caesarean section but excluding breech), A: Spontaneous labour, B: Induced labour, C: Caesarean section before labour</td>
</tr>
<tr>
<td>10</td>
<td>All multi-gestations, ≥36 weeks (including previous Caesarean section), A: Spontaneous labour, B: Induced labour, C: Caesarean section before labour</td>
</tr>
</tbody>
</table>

Table 1: Robson’s Classification

**AIMS AND OBJECTIVES:**

- To analyse the caesarean section rates over a period of 6 months (June 2015 - December 2015).
- To categorise deliveries using Robson’s criteria for 6 months.
- To calculate the caesarean section rates within each category.
- To analyse the indications of caesarean sections.
- To compare caesarean section rates with Indian standards.

**MATERIALS AND METHODS:** Retrospective study.
**Study Period:** June 2015 to December 2015.
Study Conducted at: KAPV Government Medical College, Tiruchirapalli, a tertiary care hospital.

The following data was collected from the medical records department:
- Number of caesarean sections.
- Primary or repeat caesarean section.
- Indication of caesarean section.
- Single or multiple pregnancy.
- Presentation term or preterm birth.

The number of caesarean sections over the last 6 years was also collected to analyse the trends:

DISCUSSION: There has been increasing trends in the caesarean rates globally. The 10 group classification is the simplest way to assess and then instigate changes in the management that may alter the caesarean section rates. There has been increase in both primary and repeat caesarean delivery among the primary caesarean indications, oligohydramnios is the leading cause, non-reassuring cardiotocogram contributed to 18% of the indication. Obviously, this fraction can be lowered by reducing the interobserver difference in the interpretation of cardiotocogram by implementing frequent teaching workshop. There is a role of STAN system to determine foetal status in labour but needs extensive training and experience.

The caesarean section Target for group 1 should be 10% and is achievable with appropriate management ensuring foetal wellbeing at the same time as efficient uterine contraction.

Group 5 had nearly 98% caesarean deliveries. VBAC was only 1.3%. There has been decreasing trends in VBAC. According to WHO guidelines, an anaesthesiologist should be available at the centre. At this stage, information would be required to determine the balance of risks to mother and baby of either inducing or delivering by caesarean section as against waiting for onset of labour.

Group 6-10 were smaller groups with high percentage of CS. High percentage in these groups was due to unavoidable obstetric indications, comparable to international standards.

The higher rate of caesarean sections in Tamilnadu is because of intense auditing system.

RESULTS:

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of caesarean section</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>2173</td>
</tr>
<tr>
<td>2011</td>
<td>2103</td>
</tr>
<tr>
<td>2012</td>
<td>3025</td>
</tr>
<tr>
<td>2013</td>
<td>3396</td>
</tr>
<tr>
<td>2014</td>
<td>3072</td>
</tr>
<tr>
<td>2015</td>
<td>4801</td>
</tr>
</tbody>
</table>

Table 2: Demographic Data

Analysis:
During study period (June 2015 to December 2015).

Table 3: Caesarean Section rates in Robson’s Classification

The first column from left hand side of the table describes the each of the ten groups of the women. The numerator in each group in the second column indicates the number of caesarean sections in each group and the denominator indicates the number of women in each groups.

In the third column, the relative size of the ten groups has been calculated by taking the denominator of each group, and dividing it by the total denominator of obstetric population and expressing this as the percentage.

The fourth column shows the CS rate within each group. This is calculated by dividing the numerator in each group by the denominator in each group and expressing this as the percentage.

The fifth column shows the absolute percentage contributions made by each group to the overall caesarean section rate. This is calculated by dividing the numerator of each group, the number of caesarean sections, by the total denominator of the obstetric population.
There has been an increasing trend in the number of caesarean sections over the last six years (2173 in 2010 vs. 4801 in 2015). There were 52.6% of caesarean sections during the study period (June 2015 to December 2015). Groups 1 through 5 form 93% of the deliveries.

The highest caesarean rate is for abnormal presentation. Most of the caesarean sections (28.1%) were for a primiparous mother with a singleton in cephalic presentation. Repeat caesarean section formed 12.2% of the overall caesarean section rate. VBAC rates were close to 1.3%. The most common indications for primary caesarean section were oligohydramnios (32%) and cephalopelvic disproportion (30%). The caesarean section rate of 52.6% is higher than WHO standards, in par with the Indian standards.

**Strategies to reduce caesarean sections based on the Analysis:**

**Group 1:** Nulliparous, single, cephalic, >37 weeks, in spontaneous labour.

This group of women is the most important group of women in all labour and delivery units. It is a group of women where there is greatest variation between different labour and delivery units. The CS rate in this group in conjunction with other labour events and outcomes should be considered as gold standard measure of any labour and delivery.

The labour events and outcomes to measure foetal reasons and dystocia, vaginal operative delivery, artificial rupture of membrane, oxytocin, primary post-partum haemorrhage, blood transfusion rates, neonatal outcomes.

CS rate in group one will depend on not only type of management use but also to a certain extent on the relative size of group two. This, in most obstetrics populations will depend on the delivery unit’s policy on induction in general and post-dates in particular.

CS rate increases with gestation from 37 weeks and upwards in nulliparous women, with single cephalic pregnancies in spontaneous labour. Therefore, if postdated pregnancies are induced before the onset of spontaneous labour the incidence in group one will decrease and that should contribute to a lower CS rate in group one.

**Group 2:** Nulliparous women, single, cephalic, >37 weeks, induced or CS before labour.

This is the largest contributing group to the overall caesarean section rates. This group has to be further divided into those who delivered by pre-labour caesarean section and those who had labour induced. It all depends on different institution protocols and differ from individuals. So, more should be emphasised on the methods of induction. Another reason is that delivery was indicated before waiting for the onset of spontaneous labour.

**Group 3:** Multiparous (excluding previous caesarean section), single, cephalic >= 37 weeks, in spontaneous labour.

This is the most consistent group in the 10 group classification system. This is due to all the women falling in this group tend to deliver vaginally without any obstetric intervention.

The common causes for CS are foetal distress and those pertaining to medical conditions.

**Group 4:** Previous caesarean section, single, cephalic >= 37 weeks

This group depends mainly on the incidence of pre-labour caesarean section. This can also be due to reasons like caesarean on maternal request. This should be treated same as that of group 2, but the number of caesarean sections in group 4 is relatively lower than that of group 2.

**Group 5:** Previous caesarean section, single, cephalic >= 37 weeks

Group 5 is a heterogenous group of women. The Interpretation of this group is dependent on primary caesarean section rates. One way to reduce it is to reduce the caesarean section rates. The reasonable target for this group should be 60-70%. There should be a balance between waiting for spontaneous labour or delivering by caesarean section itself. The most unpredictable nature of uterine rupture should be expected always in such patients.

**Group 6:** All nulliparous breech.

The caesarean section of this group is nearing 100% due to increased foetal morbidity. The success depends upon two factors: preterm delivery and external cephalic version. There is also increased incidence of breech in nulliparous women. Lack of skill of delivering by breech also contributes to increase in CS in this group.

**Group 7:** All multiparous breech (including previous caesarean section).

The contribution made from this group is very meagre in terms of rising caesarean rates. These groups cannot become targets for reduction in the overall caesarean rates.
**Group 8:** All multiple pregnancies (including previous caesarean section).

The caesarean section rates in this group is increasing in the recent years due to increase in the assisted reproductive technology. It is also affected if the second twin is breech, discordance between the twins and monozygosity. It needs to be analysed based on the previous obstetric records and course of the pregnancy.

**Group 9:** All abnormal lies (including previous caesarean section).

The contribution of the caesarean section is very small and the caesarean section rates should be 100% for this group.

**Group 10:** All single, cephalic, <= 36 weeks (including previous caesarean section).

The incidence in this group is increased in all referral centres. It is most consistent in clinical management and in terms of decision making by the obstetricians. The high incidence of preterm section in this group signifies high incidence of medical conditions such as intrauterine foetal growth restriction and preeclampsia and gestational diabetes mellitus.[11]

**Perinatal Mortality:**

- The average no. of perinatal death in the study period is 11/month.
- The perinatal mortality is only around 1.19% which shows a tremendous decrease from the last decade.

**CONCLUSION:** Caesarean sections are effective in saving maternal & infant lives, but only when they are required for medically indicated reasons. At population level, caesarean section rates higher than 10% are not associated with reductions in maternal & newborn mortality rates. Robson’s system stratifies woman according to their obstetrics characteristics, thereby allowing a comparison of caesarean section rates with fewer confounding factors. An internationally accepted classification is much needed to scientifically study the effects of rising caesarean rates.

**REFERENCES**