# Evaluation of TGCS-Ten "Groups Classification System" for Caesarean Section in a tertiary care hospital of Uttar Pradesh

## [1]Dr. Pooja Gupta, [2]Dr. Subrat Chandra, [3]Dr. Varsha Kumari

[1]Professor (Junior Grade), Dept of Obstetrics and Gynecology, Dr. Ram manohar lohia institute of medical sciences, Lucknow.
[2]Professor, Dept of pathology, Dr. Ram manohar lohia institute of medical sciences, Lucknow.
[3]Senior Resident, dept of obstetrics and gynecology, Dr. Ram manoharlohia institute of medical sciences, Lucknow.

**CORRESPONDING AUTHOR :DR. SUBRAT CHANDRA**

**ABSTRACT**

Caesarean section is an important life saving intervention that can reduce maternal and neonatal morbidity and mortality. "When medically necessary, a caesarean section can effectively prevent maternal and newborn mortality", but complications with adverse feto-maternal outcome is well documented too.This analytical observational study was done to analyse caesarean section in a tertiary care hospital of north India.

**Aim and objective:**To find out overall CS rate and alsoCS rates in different categories of pregnancy with group size according to TGCS-TEN "GROUPS CLASSIFICATION SYSTEM"

**Result:**Total number of deliveries in one year duration was **4443.** Total no.vaginal deliveries =**2462; no. of CSs = 1981**contributing to caesarean section rate of**44.58%.**

**Discussion and Conclusion:**The single group that most contributed to the overall CS rate was Group 5, accounted for about $1/3rd$ (**34.1%**) of all the CS in our setting . Women with a single previous CS (Group 5.1) were the ones that contributed most to the overall rate of CS (**15.23%).**Therefore, it would make sense to implement interventions to reduce the rate of CS in this specific subgroup. The secondgroup contributing to the overall CS rate was Group 1 , (**25.99%).**Therefore, this would also be an important group to target in order to reduce the overall CS rate. In conclusion we found out that TGCS-TEN "GROUPS CLASSIFICATION SYSTEM" is very important tool to identify target population to decrease CS rate and thus preventing unforeseen complications of caesarean section with better maternal care.

**Keywords** : caesarean section, TGCS-TEN "GROUPS CLASSIFICATION SYSTEM"

**Introduction**

Caesarean section is an important life saving intervention that can reduce maternal and neonatal morbidity and mortality. "When medically necessary, a caesarean section can effectively prevent maternal and newborn mortality", but complications with adverse feto-maternal outcome is well documented too.

Although CS in general is a safe operation, the procedure can lead to serious complications. These include endometritis, wound haematoma and infection, venous thromboembolism, anaesthetic complications, infertility and abdominal adhesions which can lead to chronic abdominal and pelvic pain as well as a risk of injury to adjacent organs in future surgeries [1-6]. Furthermore, CS bears consequences for subsequent pregnancies, with higher risks of excessive blood loss, uterine scar rupture, placenta accreta, placenta praevia and abruptio placentae [7-10]. Most of these complications are more serious in resource-limited settings, reinforcing the restraint which should be used in deciding to perform CS. In addition to these medical complications, CS is associated with considerable costs for patients and hospitals, resulting in a longer hospital stay, whilst the number of available beds in most centres is limited. Therefore, to avoid unnecessary CS, management of women in labour should be appropriate and the decision for CS be made only in situations where no better alternatives are available [11].

Two new HRP (human resource planning) studies show that when caesarean section rates rise towards 10 % across a population, the number of maternal and newborn deaths decreases. "When the rate goes above 10 %, there is no evidence that mortality rates improve."

The national C-section rate is 21.5%, higher than                    what the WHO terms "ideal", 10-15 %,{ NFHS 5 (National Family Health Survey). States in the north and the east show very low C-section rates while those in the south and the west show very high rates, indicating a high degree of geographical variation.

## "RISING     CS     RATES     ARE     A     MAJOR     PUBLICHEALTH     CONCERN"

Ideally, there should be a classification system to monitor and compare CS rates at facility level in a standardized, reliable, consistent and action-oriented manner[12].

> The 10-Groups classification also known as the **TGCS-Ten "Groups Classification System"** was created to prospectively identify well-defined, clinically relevant groups of women admitted for delivery and to investigate differences in CS rates within these relatively homogeneous groups of women.

Unlike classifications based on indications for CS, the Robson Classification is for **"all women"** who deliver at a specific setting (e.g. a maternity or a region) and not only for the women who deliver by CS. It is a complete perinatal classification.

The classification is simple, robust, reproducible, clinically relevant, and prospective. It allows the comparison and analysis.[13].

"WHO proposes **TGCS-Ten "Groups Classification System" also called as Robson's Classification** as a global standard for assessing, monitoring and comparing caesarean section rates within healthcare facilities over time, and between facilities".

- **WHO expects that the use of TGCS-Ten "Groups Classification System"will help health care facilities to:**

- Identify and analyze the groups of women which contribute        most and least to overall CS rates.

- Compare practice in these groups of women with other units who have more desirable results and consider changes in practice.

- Assess the effectiveness of strategies or interventions targeted at optimizing the use of CS.

- Assess the quality of care and of clinical management practices by analyzing outcomes by groups of women.

- Assess the quality of the data collected and raise staff awareness about the importance of this data, interpretation and Taking this into account we planned an analytical observational study to analyse 1 yr data of all pregnant women who delivered at our tertiary care centre using **TGCS-Ten "Groups Classification System"**

  Thus to make future plans and protocols to intervene in system to curtail down rising CS rates and thus to prevent its unforeseen complications

## Aim and Objective:

- AIM – Analysis of caesarean section using**TGCS-Ten "Groups Classification System"**

 at atertiary care hospital.

OBJECTIVES -1.Assesment of  caesarean section rate .

                    2.Assessment of type of obstetric population and type

with maximum caesarean section rate.

## Method

**Study Setting**: an Institutional tertiary health care center(public sector) in northern India which receives many referrals from north eastern part of Uttar Pradesh representing a community.

**Study period** : 1 yr

**Study design** : Observational Study

**Sample** : Data of all pregnant women who delivered in the tertiary care centre .

- Delivery records of all pregnant women for one year was classified according to **TGCS-Ten "Groups Classification System"**

**TABLE 1 :WHO TEN GROUP CLASSIFICATION TABLE:**

| Group | Obstetric Population |
|---|---|
| 1 | Nulliparous women with a single cephalic pregnancy, ≥37 weeks gestation in spontaneous labour |
| 2 | Nulliparous women with a single cephalic pregnancy, ≥37 weeks gestation who had labourinduced or were delivered by CS before labour |
| 2a | Labourinduced |
| 2b | Pre-labourCS |

| 3 | Multiparous women without a previous CS, with a single cephalic pregnancy, ≥37 weeks gestation in spontaneous labour |
| 4 | Multiparous women without a previous CS, with a single cephalic pregnancy, ≥37 weeks gestation who had labourinduced or were delivered by CS before labour |
| 4a | Labourinduced |
| 4b | Pre-labourCS |
| 5 | All multiparous women with at least one previous CS, with a single cephalic pregnancy, ≥37 weeks gestation |
| 5.1 | WithonepreviousCS |
| 5.2 | With two or more previous CSs |
| 6 | All nulliparous women with a single breech pregnancy |
| 7 | All multiparous women with a single breech pregnancy including women with previous CS(s) |
| 8 | All women with multiple pregnancies including women with previous CS(s) |
|  |  |
| 9 | All women with a single pregnancy with a transverse or oblique lie, including women with previous CS(s) |
| 10 | All women with a single cephalic pregnancy < 37 weeks gestation, including women with previous CS(s) |

- **TGCS-Ten "Groups Classification System"** is for "all women" who deliver at a specific setting and not only for the women who deliver by CS.
- The system classifies all women admitted for delivery into one of 10 groups that are mutually exclusive and totally inclusive. This means that, based on a few basic obstetric variables, every woman admitted to deliver in any facility can be classified into one, and only one, of the 10 groups and no woman will be left out of the classification.

A monthly caesareanaudit    presentation was conducted    monthly for a whole one year for sensitization as well as awareness for proper maintainence of delivery records.

**TABLE 2 ;Summary of specifications for variables in each Robson group**

| Group | Parity | Previous CS | Numberoffetuses | Fetal presentation or lie | Gestational age(weeks) | Onset of labour |
|---|---|---|---|---|---|---|
| 1 | 0 | No | 1 | Cephalic | ≥ 37 | Spontaneous |
| 2 | 0 | No | 1 | Cephalic | ≥ 37 | Induced or CS before labour |
| 3 | ≥ 1 | No | 1 | Cephalic | ≥ 37 | Spontaneous |

| 4 | ≥ 1 | No | 1 | Cephalic | ≥ 37 | Induced or before labour | CS |
| 5 | ≥ 1 | Yes | 1 | Cephalic | ≥ 37 | Any | |
| 6 | 0 | No | 1 | Breech | Any | Any | |
| 7 | ≥ 1 | Any | 1 | Breech | Any | Any | |
| 8 | Any | Any | ≥ 2 | Any | Any | Any | |
| 9 | Any | Any | 1 | TransverseorOblique | Any | Any | |
| 10 | Any | Any | 1 | Cephalic | < 37 | Any | |

Definitions used in this setting:

1. Spontaneous labour: on arrival 3 contractions / 10 min with cervical effacement > 50% and dilation > 3 cm, with intact or ruptured membranes.2. Induction: use of misoprostol, Foley catheter or oxytocin in a woman who does not fulfill the criteria for spontaneous labour

▪ Data was entered in **TGCS-Ten "Groups Classification System"** report table which is as follows-

TABLE 3;

| TGCS-Ten "Groups Classification System" Report<br>setting name: *Hospital ABC* | | | | | | |
|---|---|---|---|---|---|---|
| **Column1** | **Column2** | **Column3** | **Column4** | **Column5** | **Column6** | **Column7** |
| Group | Number ofCS in group | Number ofwomenin group | GroupSize[1]( %) | GroupCS rate[2] (%) | Absolute group contribution to overall CS rate[3](%) | Relative contribution of group to overall CS rate[4](%) |
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | | | | | | |
| 8 | | | | | | |
| 9 | | | | | | |
| 10 | | | | | | |
| Total*Total numberCSTotal number 100%OverallCS rateOverallCS rate100% women delivered | | | | | | |

**\* These totals and percentages come from the data in the table.**
**1. Group size (%) = n of women in the group / total N women delivered in the hospital x 100**
**2. Group CS rate (%) = n of CS in the group / total N of women in the group x 100**
**3. Absolute contribution (%) = n of CS in the group / total N of women delivered in the hospital x 100**
**4. Relative contribution (%) = n of CS in the group / total N of CS in the hospital x 100**

Definitions used in this setting:

1. Spontaneous labour: on arrival 3 contractions / 10 min with cervical effacement > 50% and dilation > 3 cm, with intact or ruptured membranes.

2. Induction: use of misoprostol, Foley catheter or oxytocin in a woman who does not fulfill the criteria for spontaneous labour

Results obtained in report table was analysed and discussed as to find out largest group size as well as group with highest caesarean rate was found out and indications of caesarean section in the highest group was revisited

Results

Total number of deliveries in one year duration  was **4443.** Total vaginal deliveries were **2462** while number of caesarean sections were **1981** contributing to caesarean section rate  of **44.58%**

**TABLE 4: WHO Robson Report Table**

| SETTING NAME: DR. RMLIMS, LUCKNOW, UP | | | PERIOD :ONE YEAR (JANUARY TO DECEMBER) | | | |
|---|---|---|---|---|---|---|
| COLUMN 1 | COLUMN 2 | COLUMN 3 | COLUMN 4 | COLUMN 5 | COLUMN 6 | COLUMN 7 |
| Group | Number of CS in group | Number of women in group | Group Size (%) [C3/T] | Group CS rate (%) [C2/C3] | Absolute group contribution to overall CS rate (%) [C2/T ] | Relative contribution of group to overall CS rate (%) [C2/TCS] |
| 1 | 515 | 1199 | 26.98 | 42.95 | 11.59 | 25.99 |
| 2<br>2a<br>2b | 287<br>215<br>72 | 794 | 17.87 | 36.14 | 6.45 | 14.48 |
| 3 | 109 | 619 | 13.93 | 17.60 | 2.45 | 5.50 |
| 4<br>4a<br>4b | 117<br>78<br>39 | 443 | 9.97 | 26.41 | 2.63 | 5.90 |
| 5<br>5.1<br>5.2 | 677<br>515<br>162 | 912 | 20.52 | 74.23 | 15.23 | 34.17 |
| 6 | 89 | 103 | 2.31 | 86.40 | 2.0 | 4.49 |
| 7 | 42 | 69 | 1.5 | 60.86 | 0.94 | 2.12 |
| 8 | 35 | 52 | 1.1 | 67.30 | 0.78 | 1.76 |
| 9 | 43 | 44 | 0.99 | 97.72 | 0.96 | 2.17 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **10** | **67** | **208** | **4.68** | **32.21** | **1.50** | **3.38** |

| |
|---|
| TOTAL =  4443<br>TOTAL  CS = 1981;  TOTAL VAGINAL DELIVERY = 2462<br>OVERALL CS RATE = 44.58% |

## Discussion And Conclusion

**TGCS-Ten "Groups Classification System"  Report Table interpretation:**

**Quality of Data and Type of Population**

1. Size of Group 9 (Column 4) is 0.99%which is within the expected range (<1%). However the CS rate (Column 5) is 97.72% which is very near to the expected value (100%). This suggests that the quality of data approximately upto mark which can be attributed to monthly caesarean audits held in our tertiary care centre.
2. The size of Groups 1 + 2 (Column 4) is 44.8% which is higher than the expected range. The ratio of the sizes of Group 1/Group 2 is 1.5 which is lower than the expected (> 2:1) .If data collection is correct, a lower ratio may indicate that we have a high induction/prelabourCS issue which  indicate a high risk population in nulliparous women and are likely therefore to have a high CS rate,which can be attributed to reason that our centre receives many referrals.
3. The size of Groups 3 + 4 (Column 4) is 23.9% which is less than expected(>30%) suggest that this hospital serves a population with moderate fertility rates and also the size of Group 5 is very high which was accompanied by a very high overall CS rate.The ratio of Group 3/Group 4 sizes is 1.39 which is less than expected (it is lower than the ratio of Groups 1/ Group 2) and it indicates that this hospital  perform many inductions or prelabourCS in multiparas without previous CS scars. A low ratio (due to large Group 4b) suggests a poor previous maternal experience in vaginal delivery and a request for pre-labourCS in multiparous women. Another explanation may be pre-labourCS done to perform tubal ligation
4. The size of Group 5 (Column 4) is 20.52% which is very high and indicates that this hospital receives many women with a previous CS. Perhaps many of them were delivered at the same hospital in the past years, when they were nulliparas(in Groups 1 or 2).
5. The size Groups 6 + 7 (Column 4) is 3.8% which is within the expected range for breeches. The ratio of Group 6/Group 7 is 1.54 which is almost near to expected (2:1) since. This indicates adequate data collection and implies breeches are more frequent in nulliparous than multiparous.
6. The size of Group 8 (Column 4) is 1.1% which is close to the expected prevalence of multiple pregnancies (1-2%)in the general population.
7. The size of Group 10 (Column 4) is 4.68% which is higher than average (4.2%)and suggests that this hospital  receives high-risk patients from other local hospitals.

**CS rates per Groups and contribution**

1. The CS rate for Group 1 (Column 5) is 42.95% which is veryhigh, compared to WHO reference hospitals which should under 10%. It would be interesting to look at the main indications for CS for this group and review the clinical protocols on labor management for nulliparous women in spontaneous labor with a single cephalic tem infant which can put further control over tremendous rise in CS rate.

2. The CS rate for Group 2 (Column 5) is 36.14% which is slightly higher than compared to average hospitals (20-35%). This is part due to the size of Group 2a(>2b) (induced patients undergoing CS in nulliparas,which may be due to high failure rate of induction and also indicates that prelabour CS are less performed at this tertiary care centre.

3. The CS rate for Group 3 (Column 5) is 17.8% which is much higher than the expected range (3.0%) and indicates that the management of multiparas in spontaneous labor at term is probably inadequate orit can be attributed to reason that high risk population are being highly referred to our centre from local hospitals.

4. The CS rate for Group 4 (Column 5) is 26.41% which is slight higher than the average (< 15%),high CS rate in Group 4 reflects a high maternal request for CS even if these women have delivered their first pregnancy vaginally. This may be because of a previously traumatic or prolonged labour

5. The CS rate for Group 5 (Column 5) is 74.23% which is very high. The size of Group 5b (women with >1 previous CS) is not very big, so this is not the cause. But we can notice that the rate of CS in women with one previous CS is high; this indicates there are probably few trials of labor in these women.

6. The CS rate for Group 8 (Column 5) is 67.3% which is higher than average (60%).. Alternatively, there may be a more liberal policy toward performing CS in twin pregnancies or a higher risk population.

7. The CS rate for Group 10 (Column 5) is 32.2% which is high. It suggests that most women who deliver preterm at this hospital are probably not entering labour spontaneously and may be having prelabour CS because of complications (e.g. preeclampsia or fetal growth restriction or pprom).

8. The contributions of Groups 1, 2 and 5 add up to 74.64% of all CS (Column 7) which is within the expected value (2/3 of all CS).These three groups should be the focus of attention to lower the overall CS rate. The higher the overall CS rate, the greater the focus should be in Group 1.

9. **The single group that most contributed to the overall CS rate was Group 5 which accounted for about one third (34.1%) of all the CS in our setting (Column 7).** When we look at the subdivisions, we notice that women with a single previous CS (Group 5.1) were the ones that contributed most to the overall rate of CS in that hospital (Column 6: 15.23%).Therefore, it would make sense to implement interventions to reduce the rate of CS in this specific subgroup. This could start, for example, with an audit of all women with one previous CS and to see how many were offered a trial of labor (TOLAC).

The second group which contributed most to the overall CS rate was Group 1 (Column 7). These women contributed to 25.99 % (Column 7) of all the CS Therefore, this would also be an important group to target in order to reduce the overall CS rate. For example, the hospital clinicians could start

by auditing the records of the 1199women in this group (Column 2) and look at the indications for CS in this group of women. This could lead to changes in the hospital´s clinical protocols and/or the creation of a monthly discussion with health professionals to discuss these cases.

In **conclusion** we found out that **TGCS-Ten "Groups Classification System"** is very important tool to identify target population to decrease CS rate and thus preventing unforeseen complications of caesarean section. This should be used in all public as well as private sectors providing maternity services.

**References :**

1. Burrows LJ, Meyn LA, Weber AM. Maternal morbidity associated with vaginal versus cesarean delivery. Obstet Gynecol. 2004;103:907–12.

2. Liu S, Liston RM, Joseph KS, Heaman M, Sauve R, Kramer MS, et al. Maternal mortality and severe morbidity associated with low-risk planned cesarean delivery versus planned vaginal delivery at term. CMAJ. 2007;176:455–60.

3. Jacobsen AF, Skjeldestad FE, Sandset PM. Incidence and risk patterns of venous thromboembolism in pregnancy and puerperium–a register-based case-control study. Am J Obstet Gynecol. 2008;198:233. e1-7

4. Murphy DJ, Stirrat GM, Heron J, Team AS. The relationship between caesarean section and subfertility in a population-based sample of 14.541 pregnancies. Hum Reprod. 2002;17:1914–7.

5. Nikolajsen L, Sorensen HC, Jensen TS, Kehlet H. Chronic pain following caesarean section. Acta Anaesthesiol Scand. 2004;48:111–6.

6. Nisenblat V, Barak S, Griness OB, Degani S, Ohel G, Gonen R. Maternal complications associated with multiple cesarean deliveries. Obstet Gynecol. 2006;108:21–6.

7. Daltveit AK, Tollanes MC, Pihlstrom H, Irgens LM. Cesarean delivery and subsequent pregnancies. Obstet Gynecol. 2008;111:1327–34.

8. Usta IM, Hobeika EM, Musa AA, Gabriel GE, Nassar AH. Placenta previa-accreta: risk factors and complications. Am J Obstet Gynecol. 2005;193:1045–9.

9. Yang Q, Wen S, Oppenheimer L, Chen X, Black D, Gao J, et al. Association of caesarean delivery for first birth with placenta praevia and placental abruption in second pregnancy. BJOG. 2007;114:609–13.

10. Gurol-Urganci I, Cromwell DA, Edozien LC, Smith GC, Onwere C, Mahmood TA, et al. Risk of placenta previa in second birth after first birth cesarean section: a population-based study and meta-analysis. BMC Pregnancy Childbirth. 2011;11:95.

11. Souza JP, Gulmezoglu A, Lumbiganon P, Laopaiboon M, Carroli G, Fawole B, et al. Caesarean section without medical indications is associated with an increased risk of adverse short-term maternal outcomes: the 2004-2008 WHO global survey on maternal and perinatal health. BMC Med. 2010;8:71

12.. WHO Statement on Caesarean Section Rates. *Geneva: World Health Organization*; 2015 (WHO/RHR/15.02).

13. BetránAP, VindevoghelN, Souza JP, GülmezogluAM, TorloniMR. A. *Systematic review of the Robson Classification for caesarean section: What works, doesn't work and how to improve it.* PLoSONE. 2014;9(6).