

## PROFESSIONAL PAPER

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# Cesarean Section Rate Analysis in University Hospital Tuzla - According to Robson's Classification

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## ABSTRACT

**Objective.** For last decades, there has public concern about increasing Cesarean Section (CS) rates, and it is an issue of international public health concern. According to World Health Organisation (WHO) there is no justification to have more than 10-15% CS births. WHO proposes the Robson ten-group classification, as a global standard for assessing, monitoring and comparing cesarean section rates. The aim of this study was to investigate Cesarean section rate at University Hospital Tuzla, Bosnia and Herzegovina. **Methods.** Cross sectional study was conducted for one-year period, 2015. Statistical analysis and graph-table presentation was performed using Excel 2010 and Microsoft Office programs. **Results.** Out of 3,672 births, a total of 936 births were performed by CS. Percentage of the total number of CS to the total birth number was 25,47%. According to Robson classification, the largest was group 5 with relative contribution of 29,80%. On second and third place were group 1 and 2 with relative contribution of 26,06% and 15,78% respectively. Groups 1, 2, 5 made account of relative contribution of 71,65%. All other groups had entirely relative contribution of 28,35%. **Conclusion.** Robson 10-group classification provides easy way in collecting information about CS rate. It is important that efforts to reduce the overall CS rate should focus on reducing the primary CS. Data from our study confirm this attitude.

**Key words:** Cesarean Section, Robson classification.

## 1. INTRODUCTION

According to recommendations for proper prenatal and birth care, from a Joint International Conference on Appropriate Technology for Birth, organised by World Health Organisation in 1985, there is no justification in any specific geographic region to have more than 10-15% Cesarean Section (CS) births (1). Rate above 15% are not associated with additional reduction in maternal and neonatal mortality and morbidity (2). Notwithstanding, Cesarean rates have risen considerably in the last 25 years, all over the world, for a number of supposed reasons: reducing perinatal morbidity and mortality, increased age of pregnant women, birth in women with serious health conditions, the striving

for „perfect“ offspring, births after previous cesarean section, labour induction, continuous cardiotocography during pregnancies (3-6). For majority of the female population, vaginal birth is becoming less desirable, while CS is generally considered painless, sparing the woman and being safer for the child. The obstetricians support CS births for fear of prosecution, personal comfort or lack of delivery skills. Thus, its increase would be desirable, and hypothetically, would be accompanied by decreasing perinatal mortality. However, the reasons for this rise do not seem linked to increased access to birth care, but rather related to an increase in elective and subjective use of CS, possibly reflecting patient and doctor preferences (5, 7, 8, 9).

As with any surgery, CS are associated with short and long term risk which can extend many years beyond the current delivery and effect the health of the women, her child, and future pregnancies. In recent years, governments and clinicians have expressed concern about the rise in the numbers of cesarean sections births and the potential negative consequences for maternal and infant health. But there is currently no internationally accepted classification system for cesarean section that would allow meaningful and relevant comparisons of cesarean rates across different facilities and regions. At the hearth of the challenge in defining the optimal cesarean section rate at any level is the lack of a reliable and internationally accepted classification system to produce standardised data, enabling comparisons across populations and providing a tool to investigate drivers of upward trend in cesarean section.

World Health Organisation (WHO) proposes the Robson classification system as a global standard for assessing, monitoring and comparing CS rates within healthcare facilities over time, and between facilities. In order to assist healthcare facilities in adopting the Robson classification, WHO will develop guidelines for its use, implementation and interpretation, including standardisation of terms and definitions (10). Robson, 2001 proposed a new classification system, The Robson 10-group Classification System allow critical analysis according to characteristics of pregnancy (11). The system classifies all women into one of 10 categories that are mutually exclusive and, as a set, rotally comprehensive. The categories are based on five basic obstetric characteristics that are routinely collected in all maternities:

- Parity (nulliparous, multiparous with and without previous caesarean section),
- Onset of labour (spontaneous, induced or pre-labour cesarean section),
- Gestational age (preterm or term),
- Foetal presentation (cephalic, breech or transverse),
- Number of fetuses (single or multiple).

The classification is simple, reproducible, clinically relevant, and prospective- which means that every woman admitted for delivery can be immediately classified into one of 10 groups based on these few basic characteris-

Group	Classification
1	Nulliparous, single cephalic, ≥ 37 weeks in spontaneous labour
2	Nulliparous, single cephalic, ≥ 37 weeks induced (including prelabour SC)
3	Multiparous, single cephalic, ≥37 weeks, (excluding SC), in spontaneous labour
4	Multiparous, single cephalic, ≥37 weeks, induced labour or SC before labour
5	Multiparous, single cephalic, ≥37 weeks, previous CS
6	All nulliparous breech
7	All multiparous breech (including previous CS)
8	All multiple pregnancies (including previous CS)
9	All transverse or oblique lie (including previous CS)
10	All preterm single cephalic, ≤ 37 weeks, (including previous CS)

Table 1. Robson's 10- group classification,

tics. This allows a comparison and analysis of caesarean section rates within and across these groups.

The aim of this study was to investigate cesarean section rate at University hospital Tuzla, Bosnia and Herzegovina.

## 2. METHODS

This cross sectional study was conducted for one Year period, 2015 at University hospital Tuzla, Bosnia and Herzegovina. All women delivered in this period were included in this study. Relevant obstetric data as parity, mode of previous deliveries, previous cesarean section and indications, gestational age. The data from the birth and neonatal history has been prospectively collected and added to the electronic database. Upon acquisition, the data has been sorted according to Robson 10 group classification based on four obstetric concept. Statistical analysis and graph-table presentation was performed using Excel 2010 and Microsoft Office programs.

## 3. RESULTS

During one-year period - 2015, there have been a total of 3,672 births. There were 1,914 nulliparous (52,10%) and 1,760 multiparous (47,90%). Out of this number 936 births were delivered by Cesarean section. Percentage of the total number of Cesarean births to the total birth number was 25,47%. The number of CS done to nulliparous and m ultiparous was 541 (56,18%), and 422(43,82%) respectively.

Robson's group	Absolute contribution of CS made by each group to total birth (3672)		Relative contribution made by each group to overall CS (936)	
	No	%	No	%
1. Group	251	6.83	251	26.06
2. Group	152	4.18	152	15.78
3. Group	16	0.43	16	1.66
4. Group	20	0.54	20	2.07
5. Group	287	7.81	287	29.80
6. Group	80	2.18	80	8.30
7. Group	24	0.65	24	2.49
8. Group	25	0.68	25	2.59
9. Group	16	0.43	16	1.66
10. Group	65	1.76	65	6.74

Table 2. Robson's 10-group classification in year 2015 in University hospital Tuzla

On analysis of CS according to Robson's classification, different rate of each group was shown separately.

Group 5 (women with single cephalic full-term pregnancy, who have already undergone at least one CS) made the highest absolute contribution of all births with 287 CS of all deliveries (7,81%), and greatest relative contribution to the total CS rate with 29,80% of all Cesarean sections. Group 5 was further analysed according to the indications for CS. Out of 287 CS procedures, emergency CS were 157(54,70%), and elective 130(45,30%). Further, during year 2015 entirely 331 women with praevious Cesarean birth were admmitted at University hospital. Out of this number 275 women (83,02%) undergone repeated CS, and 56 women (16,91%) undervent vaginal birth.

Group 1 (nulliparous with single cephalic full-term pregnancy, with spontaneous labour without praevius CS) had the second highest absolute contribution of all births with 251(6,83%) and second highest relative contribution to the CS rate with 26,05% of total number of CS.

Group 2 (nulliparous with single cephalic full-term pregnancy, prelabour cesarean section) had third highest absolute contribution with 152 (4,18%) of all births, and the third highest relative contribution of all CS with 15,78%.

Group 5, 1, and 2 account had absolute contribution with 690 (18,78%) of all births, and account of reative contribution of 71,65% of all CS.

The rest of other seven groups (4, 6-10) made account of 246 women and absolute contribution of 6,69% of all births, and account of relative cintribution of 25,54% of all CS.

#### 4. DISCUSSION

For the last 30 years, there has been a public concern about increasing CS rates (10). The increase has been a global phenomenon, the timing and rate of the increase has different from one country to another, and marked differences in rates persists (12). While analysing the CS rate, the number of CS performed should be simple to determine but the indications will be more difficult to standardise. The 10-group classification has made possible comparisons of CS over time in one unit and between different units, in different countries.

Out of 3674 deliveries at University hospital in Tuzla, 963 (25,47%) were completed by CS. This CS rate is less than in Australia -28% (13), USA -31,1%, (14), or Iran -40% (15), and higher than in Norway-13,9% (16).

By analysing CS rates, the main contributing groups to overall CS rate were group 5 (previous CS) giving the highest contribution, 29,80% of all CS which is simillar to other autors (17,18), and lower than in some studies (12). Out of 331 women with praevius CS 275 (83,08%) were delivered by repeated CS, vaginal birth after CS (VBAC) had 56(16,92%) women wich is highest rate than in others studies (12, 19), and not comparable to international standards (20). If we compare our results to the results of other studies, group 5, generally shows unsatisfying results. Following a detailed analysis of CS indications in this group, we expected increasing number of successfully completed vaginal births following CS. Group 5 was further analysed according to the indications of CS. Out of 287 CS procedure from this group, elective CS were performed in 157 cases (54,70%), and emergency CS were performed in 130 cases (45,30%) wich is simillar to results in other studies (12).

Groups 1 and 2 account 26,6% and 15,78% respectively, making relative contribution of 41,84%, wich is simillar to other studies (3, 11, 12, 21), but lower than in some studies (18). These two groups generate the majority of the further increase in CS popularity.

As showed in our study, when analysing the CS rates, the main contributing groups to overall CS rate were group 5,1 and 2, giving contribution rate of 71,64%,

which is similar to other studies (3,12,17,18), although they make just 18,82% of all deliveries as we can see in picture 2.

Groups 3 and 4 were characterised as „low risk“ groups in wich Cesarean section rate should be less than 3%. In our study account was for relatively contribution of 1,66% vs 2,07% of all CS respectively.

Groups 6-10 were smaller groups presented with high rates of CS due to the unavoidable obstetric conditiones (breech presentation, multiple pregnancies, abnormal fetal lies or preterm deliveries), but their contribution to the overall CS rate was smaller (21,78%). When compared with other studies internationally, almost all studies convayed comparable results in groups 6-10 (3,12, 17).

For decreasing CS rate, target groups where we must change our approach for mode of delivery are groups 1,2 and 5. For each of these groups, further analysis of the reasons for choosing the CS as the best model of birth vill be necessary.

#### 5. CONCLUSION

Robson 10-group classification provides easy way in collecting information about Cesarean section rate wich obtains good insight into certain birth groups. Detailed analysis of 10 groups help us to detect the causes of increased Cesarean section rates for each group. It is important that efforts to reduce the overall CS rate should focus on reducing the primary CS rate (group 1 and 2) and on increasing vaginal birth after CS (group 5).

Our study confirm this attitude and composes detailed analysis of every one decision to perform CS in group 1, 2 and 5.

• Conflict of interest: None declared.

#### REFERENCES

1. Worls Health Organisation. Appropriate technology for birth. *Lancet*. 1985; 2(8452): 436-7.
2. Althabe F, Belizan JM. Caesarean section:the paradox. (comment). *Lancet*. 2006; 368(9546): 1472-3.
3. Bilobrk Josipovic B, Dizdarevic Stojkanovic J, Brkovic I. Analysis of Cesarean Section Delivery at Nova Bila Hospital according to Robson Classification. *Coll. Antropol*. 2015; 1: 145-50.
4. Mukherjee SN. Rising Cesarean section rate. *J Obstet Gynecol India*. 2004; 56: 298-300.
5. Menacker F, Declercq E, Macdorman MF. Cesarean delivery:background, trends, and epidemiology. *Semin Perinatol*. 2006; 30: 235-41.
6. Chaillet N, Dumont A. Evidence-based strategies for reducing Cesarean section rates: a meta-analysis. *Birth*. 2007; 34: 53-64.
7. McCourt C, Weaver J, Statham H, Beak S, Gamble J, Creedy DK. Elective Cesarean section and decision making: a critical review of the literature. *Birth*. 2007; 34: 65-79.
8. WeaverJJ, StathamH, Richards M. Are there „unnecessary“ Cesarean sections? Perceptions of women and obstetricians about Cesarean sections for nonclinical indications. *Birth*. 2007; 34: 32-41.
9. Bedrnstein PS, Patient-choice Cesarean delivery:really a choice? *Birth*. 2007; 34: 89-90.

10. Robson MS. Classification of cesarean sections. Fetal and Maternal Medicine Review. 2001; 12(1): 23-39.
11. Robson MS. Can we reduce the caesarean section rate? Best pract res Clin Obstet Gynaecol. 2001; 15(1): 179-94.
12. Kazmi T, Sarva SV, Saiseema V, Khan S. Analysis of Cesarean Section rate-according to Robson's 10-group Classification. Oman Med J. 2012; 27(5): 415-7.
13. Stavrou EP, Ford JB, Shand AW, Morris JM, Roberts CL. Epidemiology and trends for Cesarean section births in New South Wales, Australia: a population-based study. BMC Pregnancy Childbirth. 2011; 11: 8.
14. Mac Dorman MF, Menacker F, Declercq E. Cesarean birth in the United states: epidemiology, trends, and outcomes. Clin Perinatol. 2008; 35(2): 293-307.
15. Yazdizadeh B, Nedjat S, Mohammad K, Rashidian A, Changizi N, Majdzadeh R. Cesarean section rate in Iran, multi dimensional approaches for behavioral change of providers: a qualitative study. BMC health Serv Res. 2011; 11: 159.
16. Kolas T, Hofoss D, Daltveit AK, Nilsen ST, Henriksen T, Hger R. et al. Indications for cesarean deliveries in Norway. Am J Obstet Gynecol. 2003; 188(4): 864-70.
17. Barčaite E, Kemekliene G, Railaite DR, Bartusevičius A, M-maleckiene L, Nadišauskiene R. Cesarean section rates in Lithuania using Robson ten group Classification System. Medicina. 2015; 51: 280-5.
18. Prameela RC, Farha A, Bhanumati M, Prajwal S. Analysis of Cesarean section rate in a Tertiary Hospital- according to Robson's 10 group Classification System (TGCS). J Dent Med Sci 2015; 14(2): 46-9. ,
19. Grobman WA, Lai Y, Landon MB, Spong CY, Varner MW, Caritis SN, Harper M, , Wapner RJ, Sorokin Y. The change in the VBAC Rate: An Epidemiologic Analysis Paediatr Perinat Epidemiol. 2011 Jan; 25(1): 37-43.
20. Rusillo B, Sewitch MJ, Cardinal L, Brassard N. Comparing rates of trial of labour attempts, VBAC success, and fetal and maternal complications among family physicians and obstetricians. J Obstet Gynaecol Can. 2008; 30(2): 123-8.
21. Brennan DJ, Robson MS, Murphy M, O'Herlihy C. Comparative analysis of international caesarean delivery rates using 10-group classification identifies significant variation in spontaneous labor. Am J Obstet Gynecol. 2009; 201(308): 301-8.

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