Research article

Ways to reduce the incidence of cesarean sections according to the Robson classification

Violetta Vybornykh[1], Nurgul Shoonaeva[1], Bektemir kyzy Zarema[1], Altynai Zhumabekova[2]

[1]Kyrgyz Research Center for Human Reproduction, Bishkek, Kyrgyzstan
[2]Honorary International Faculty, AJ Research Centre, AJ Institute of Medical Sciences and Research Centre, Mangalore, Karnataka, India

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Corresponding author: **Altynai Zhumabekova.** Email: altynai.zhm@gmail.com

ABSTRACT

Introduction and Aim: Cesarean sections (CS) are a medically indicated and effective method for reducing maternal and perinatal mortality. The incidence of CS has increased in developed as well as developing countries over the past few decades. The objective of this study is to analyze the distribution of births according to the Robson classification and to assess ways to reduce the frequency of CS.

Methods: This is a retrospective study based on records of the delivery histories of 18,125 female patients in the maternity department of the Kyrgyz Research Center for Human Reproduction, conducted using Robson classification.

Results: However, the parameters also showed a statistically significant decrease in the highest number of patients in group 3 by -18.9% (from 40.6% to 32.9%) and group 1 by -9.9% (from 29.2% to 26.3%) in 2022 compared to 2016, $p<0.001$. Despite their low specific weights, the 6, 7, 8, 9, and 10 groups showed a significant increase despite their small numbers.

Conclusion: Despite their low proportion but massive increase in indicators, the small number of groups 6, 7, 8, 9, and 10 may contribute to perinatal mortality and morbidity, highlighting the need for rigorous monitoring and control of pregnant women in these groups.

Keywords: Abdominal delivery; fetal gestation; cesarean section; Robson classification; labor.

INTRODUCTION

The global prevalence of cesarean sections (CS) continues to rise, despite a lack of knowledge of the underlying causes (1–3). In developed countries, the prevalence of CS is currently 30%, while in other countries, it is 60%. Therefore, the primary responsibility of the global obstetric community is to justify the need for CS. In 2015, the World Health Organization reported that having an abdominal delivery more often than 10% does not affect perinatal mortality, but it increases the risk of maternal mortality. In comparison to a normal delivery, CS presents a 2.5–3 times greater risk of septicemia and hemorrhage and a 5 times greater risk of maternal mortality (4).

CS is a medically indicated and effective method for reducing maternal and perinatal mortality. The incidence of CS has been increasing in developed as well as developing countries over the past few decades, although this increasing trend is no longer accompanied by a further reduction in these parameters. While the effect of the frequency of abdominal deliveries on maternal and perinatal morbidity and socioeconomic outcomes is still poorly understood, the data currently available show that there is no relationship between maternal and perinatal mortality and a CS rate of more than 30% (5).

At the same time, as with any surgical procedure, a CS is associated with an increased risk of complications, both immediate and long-term, with undesirable outcomes. The rates of maternal and neonatal mortality have been decreasing in the Russian Federation in recent years, but at the same time, there has been a continuous rise in the frequency of abdominal deliveries, which reached 29.3% in 2017 (6).

It is necessary to take many steps to identify the variables affecting the frequency of CS and explore effective methods to enhance it, with the identification and classification of groups of pregnant women who deliver through abdominal delivery having priority among them. Robson's classification, which has 10 main groups and is recommended by the World Health Organization as a suitable CS classification system (5), is applied. Since 2015, WHO has promoted the Robson classification as an accepted standard for assessing, monitoring, and comparing the incidence of CS in any level of obstetric facilities (7–9). This classification can be used to evaluate epidemiologic data, indications, outcomes, and financial costs (5).

The most common sign of CS is a uterine scar. In addition, because recurrent CS is a complicated surgical procedure, it is only possible to limit the frequency of operative abdominal delivery by natural birth in this situation. The process for managing vaginal birth in patients with uterine scars illustrates the validity of the selection criteria used to identify these pregnant women for delivery through the natural birth canal. Patients undergoing deliveries through

natural labor have a considerably lower risk of complications when there are clinical indications for recurrent CS along with perinatal risk factors. The frequency of repeat CS as well as obstetric and neonatal complications is significantly reduced by using such a two-stage procedure for the treatment of labor with a uterine scar (10).

By using this classification, obstetric facilities will be able to: identify and analyze the groups of women who contribute most and least to the overall rate of CSs; compare how care is provided to these groups in facilities with the best indicators to accomplish; assess the efficacy of interventions indicated to maximize the use of CSs; and evaluate the quality of care by examining the outcomes of deliveries in those groups. The objective of this study is to analyze the distribution of births according to the Robson classification and to assess ways to reduce the frequency of CS.

MATERIALS AND METHODS

This is a retrospective study based on records of delivery histories of 18,125 female patients (2016–1653, 2017–2186, 2018–2629, 2019–2275, 2020–2608, 2021–3543, and 2022–3231) in the maternity department of the Kyrgyz Research Center for Human Reproduction, Bishkek, Kyrgyzstan, and conducted using Robson classification. Each patient was entered into only one Robson classification group.

The specific weight of the number of patients according to the Robson classification, the parameters of the specific weight, and the Student's t test were used to evaluate parameter differences. At $p<0.05$, differences were considered statistically significant. The collected data were kept confidential, and the study was approved by the Bioethics Committee of the Kyrgyz-Russian Slavic University named after Boris Yeltsin (Protocol No. 5, dated March 20, 2023).

RESULTS

First-time mothers without a history of CS who had a singleton pregnancy in cephalic presentation, 37 weeks of pregnancy, and spontaneous labor (group 1) and repeat mothers without a history of CS who had a singleton pregnancy in cephalic presentation, 37 weeks of pregnancy, and spontaneous labor (group 3) were the two largest groups during the study period. The Robson classification of births is demonstrated in Table1.

However, the parameters also showed a statistically significant decrease in the highest number of patients in group 3 by -18.9% (from 40.6% to 32.9%) and group 1 by -9.9% (from 29.2% to 26.3%) in 2022 compared to 2016, $p<0.001$. In subgroup 2a of group 2, the number of first-time mothers with a singleton pregnancy in head presentation at 37 weeks of gestation and planned induction of labor went up from 5.0% in 2016 to 7.5% in 2022. In subgroup 2b, the number of CSs before labor started went down from 4.0% to 1.4%. The number of repeat births without previous CS, with a singleton pregnancy in cephalic presentation, 37 weeks gestation, and induced labor (subgroup 4a of group 4) increased by +106.9% from 4.3% in 2016 to 8.9% in 2022, while those delivered before the onset of labor by CS operation decreased by -9.0% from 3.3% to 3.0% (subgroup 4b), $p<0.001$.

Table 1: Dynamics of the distribution of births according to Robson classification

Robson Group	Classification group	Years							Growth rate
		2016	2017	2018	2019	2020	2021	2022	
1	Nulliparous, single cephalic, ≥37 weeks, spontaneous labor	29.2	24.2	27.0	19.7	28.7	24.8	26.3	-9.9
2	Nulliparous, single cephalic, ≥37 weeks, induced labour or cesarean section before labour	-	-	-	-	-	-	-	-
2a	Labour induced	5.0	5.9	4.1	4.7	8.6	6.9	7.5	+50.0
2b	Pre-labour cesarean section	4.0	3.2	6.5	2.8	4.8	2.4	1.4	-65.0
3	Multiparous without previous cesarean section, single, cephalic, ≥37 weeks, spontaneous labour	406	36.8	36.2	31.8	31.7	41.3	32.9	-18.9
4	Multiparous without previous cesarean section, single, cephalic, ≥37 weeks, induced labour or cesarean section before labour	-	-	-	-	-	-	-	-
4a	Labour induced	4.3	7.7	3.4	11.5	3.4	3.5	8.9	+106.9
4b	Pre-labour cesarean section	3.3	2.0	1.8	11.0	1.9	2.5	3.0	-9.0
5	Multiparous with previous cesarean section, single, cephalic, ≥37 weeks	-	-	-	-		-	-	-
5.1	With one previous cesarean section	6.0	5.3	4.8	5.2	5.8	6.8	5.8	-3.3
5.2	With two or more cesarean sections	3.5	5.2	6.7	6.8	7.8	5.7	6.8	+94.2
6	All nulliparous breeches	0.8	0.6	0.7	1.0	1.9	1.0	1.5	+87.5
7	All multiparous breeches (including previous cesarean section)	0.7	2.0	0.8	0.5	0.4	0.7	1.0	+42.8
8	All multiple pregnancies (including previous cesarean section)	0.3	1.1	1.5	1.3	1.2	1.1	0.9	+100.0
9	All transverse or oblique lies (including previous cesarean section)	0.3	0.5	0.7	0.6	0.6	1.0	1.0	+233.3
10	All preterm single cephalic, <37 weeks (including previous cesarean section)	2.0	4.5	5.8	3.1	3.2	2.3	3.0	+50.0

The increase in first and second births with singleton pregnancies, head presentation, 37 weeks of gestation, and induced labor is due to the hospitalization of pregnant women in the risk group at the Kyrgyz Research Center for Human Reproduction and changes in the way pregnancies are managed and

babies are born, either by inducing labor or surgical CS.

One CS, a singleton pregnancy with a cephalic presentation, 37 weeks of gestation, and inducing labor were all linked to a lower rate of repeat births in subgroup 5.1 (6.0% vs. 5.8%, $p<0.05$). Also, the number of repeat births that ended in a CS delivery went up ($p<0.05$), while the number of repeat births that ended in an elective CS delivery went up from 3.5% to 6.8% ($p<0.001$). An increase in the number of pregnant women with a history of CSs is correlated with a significant rise in the group of repeat births with two or more CSs in the past, with a singleton pregnancy in head presentation, 37 weeks of gestation, and spontaneous labor (5.2).

Despite their low specific weights, the 6, 7, 8, 9, and 10 groups showed a significant increase despite their small numbers. First-born women in group 6 who had singletons with breech presentation increased by +87.5% from 0.8% to 1.5% in the comparable years, $p<0.001$. The increase in the 7 group of all recurrent women with singleton pregnancy with breech presentation, including women with one or more histories of CS, was +42.8%, from 0.7% to 1.0%, $p<0.001$. The percentage of all women in group 8, including those with one or more histories of CS, was +100.0%, ranging from 0.3% to 0.9%, $p<0.001$. In group 9, there was a significant rise (+233.3%), from 0.3% to 1.0%, in all women with singleton pregnancies and transverse or oblique fetal positions, including women with one or more histories of CS. The percentage of all women with singleton pregnancies, fetal head presentation, and gestational ages under 37 weeks, including those with one or more histories of CS (group 10), increased by +50.0%, from 2.0% to 3.0%, respectively, $p<0.001$. Due to the low proportion, the frequency of CSs in these groups has minimal effect on the total operative rate.

DISCUSSION

According to Rudkevich *et al.*, groups 1, 2, 3, and 4 are the major reserves for lowering the incidence of surgical labor (3). This is related to the increased implementation of labor induction, labor induction methods, and enhanced CTG interpretation (3). Only groups 1 and 2 can act as the primary reserve for lowering the incidence of CS, suggest Nakamura-Pereira *et al.*, (11). In Brazil, the total CS rate reduced from 34.6% to 13.5% within 10 months of using the Robson classification in groups 1 and 2. In Sweden, the rate of CS in group 1 was reduced from 10.1% in 2006 to 3.1% in 2015 when the Robson classification was used. The rate of abdominal deliveries in group 1 significantly decreased in some clinics in the United States, from 26.4% in 2012 to 18.8% in 2014 (12).

Fetal presentation, gestational age, parity of labor, prior CS, and the quantity of fetuses are just a few obstetric factors that affect Robson classification (13). The CS rate, perinatal morbidity, and death rates in the categories that most influence the rate of abdominal deliveries are effectively determined using this classification (2, 14).

In Kyrgyzstan, the National Center for Maternal and Child Health was a pilot project for the introduction of the Robson classification because it is a tertiary referral hospital for the provision of highly qualified assistance to women with complicated pregnancies from the regions and cities of the Kyrgyzstan (15).

According to Guriev *et al.,* these are the categories that are the most numerous (16). The proportion was also high in the following groups: 2016 and 2021: repeat births with one previous CS, singleton pregnancy in cephalic presentation, 37 weeks of gestation (group 5.1); 2017, 2019, and 2022: repeat births without one previous CS, singleton pregnancy in cephalic presentation, 37 weeks of gestation, with induction of labor (group 4a); and 2018 and 2020: repeat births with two or more previous CS, singleton pregnancy in head first presentation, 37 weeks of gestation (group 5.2).

Robson classification has proven to be highly relevant in assessing and managing the prevalence of CSs, lowering the capacity of the population for reproduction (17–19). When compared to WHO statistics, the prevalence of CSs is higher in Greece. This highlights the necessity of identifying the groups most commonly associated with CSs using the Robson classification (20).

The data we collected allowed us to identify the 1st and 3rd groups of the Robson classification as the primary reserves for lowering the prevalence of CS in the Kyrgyz Research Center for Human Reproduction. However, groups 2, 3, 4, 5.1, 5.2, 10 can also be used as an alternative to reduce the prevalence of CS.

CONCLUSION

Despite their low proportion but massive increase in indicators, the small number of groups 6, 7, 8, 9, and 10 may contribute to perinatal mortality and morbidity, highlighting the need for rigorous monitoring and control of pregnant women in these groups. By choosing the method of delivery in a better way, continuous Robson classification in parameter analysis of CS incidence will help to lower.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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