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Changing Trends in Cesarean Section Deliveries in a Tertiary Hospital Using the Robson Ten Group Classification

Robson On Grup Sınıflandırması Kullanılarak Üçüncü Basamak Bir Hastanede Sezaryenle Doğumlarda Değişen Eğilimler

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Abstract

Aim: This study aimed to identify and highlight the changing trends in cesarean deliveries in a tertiary hospital using the Robson Ten Group Classification.

Material and Method: A retrospective cohort study included 103745 patients admitted to Istanbul Kanuni Sultan Suleyman Training and Research Hospital's Obstetrics and Gynecology Department between January 1, 2012, and December 31, 2021. Ten groups were established based on five basic obstetric factors: parity, labor initiation, gestational age, number of fetuses, and fetal presentation. All live or dead births over 500 grams or 20 gestational weeks were included in the study. The total number of cesarean sections in the group, the total number of women in each group, group size (%), cesarean rate (%), absolute group contribution to general cesarean section rate (%), and relative group contribution to general cesarean section rate (%) was calculated. Cesarean section indications were evaluated in 10 categories. their group sizes and cesarean section rates were recorded. Statistical analyzes were performed using SPSS Statistics for Windows, Version 24.0.

Results: Our study's average CS rate from 2012 to 2021 was 45.77%. The largest contributions to the total cesarean section rate were in group 5 (20.69%), group 3 (5.99%) and group 1 (5.75%).

Conclusion: Reducing cesarean rates, which have been high for years, is only possible with multidisciplinary studies. For this purpose, clinical practices should be combined with evidence-based practices.

Keywords: Robson ten group classification, cesarean section, pregnancy

Öz

Amaç: Bu çalışmanın amacı, üçüncü basamak bir hastanede sezaryen doğumlardaki değişen eğilimleri Robson on grup sınıflandırmasını kullanarak belirlemek ve vurgulamaktır.

Gereç ve Yöntem: Bu retrospektif çalışmaya 01.01.2012 - 31.12.2021 tarihleri arasında SBÜ İstanbul Kanuni Sultan Suleyman Eğitim ve Araştırma Hastanesi Kadın Hastalıkları ve Doğum polikliniğine başvuran 103745 hasta dahil edildi. Robson sınıflamasına göre doğumlar fetüs sayısı parite, doğum başlangıcı, gebelik yaşı, fetal presentasyon gibi beş temel karakteristik özelliklerine göre on gruba ayrıldı. 500 gramın üzerindeki veya 20 haftanın üzerindeki ölü ya da canlı tüm doğumlar çalışmaya dahil edildi. Gruptaki toplam sezaryen sayısı, her gruptaki toplam kadın sayısı, grup büyüklüğü (%), grup sezaryen oranı (%), genel sezaryen oranına mutlak grup katkısı (%) genel sezaryen oranına göreli grup katkısı (%) hesaplandı. Sezeryan endikasyonları 10 kategoride değerlendirilerek sayıları ve oranları kaydedildi. İstatistiksel analizler SPSS programının Windows için 24.0 versiyonu kullanılarak yapıldı.

Bulgular: Araştırmamızda 2012–2021 yılları arası ortalama sezaryen oranı %45,77 olarak saptandı. Toplam sezaryen oranına en büyük katkısı olan gruplar, grup (20.69%), grup 3(%5.99) ve grup 1(5.75%) olarak saptandı.

Sonuç: Yıllardır yüksek seyreden sezaryen oranlarının düşürülmesi ancak multidisipliner çalışmalarla mümkündür. Bu amaçla klinik uygulamalar kanıta dayalı uygulamalar ile birleştirilmelidir.

Anahtar Kelimeler: Robson on grup sınıflaması, sezaryen, gebelik

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INTRODUCTION

The fetus is delivered through an abdominal incision during a cesarean section, when a vaginal birth is not indicated. It is a routine surgical operation that is carried out all over the world.[1] Cesarean sections (CS) deal with several immediate and long-term risks, such as increased feto-maternal morbidity and mortality, stillbirths due to uterine rupture and postpartum hemorrhage. CS should not be a routine surgical procedure.[2,3]

In recent years, cesarean rate has gradually increased in many countries, becoming a public problem.[4,5] It is very difficult to identify and compare the risk factors of the cesarean section without using global classification. A reliable and consistent classification system should identify and highlight the factors affecting an increasing trend in cesarean delivery rates.[6] World Health Organization proposed and established the Robson Ten Group Classification (RTGC) as the international benchmark for tracking, contrasting, and assessing cesarean section rates.[7] The International Federation of Gynecology and Obstetrics (FIGO) also proposed this classification method.[8] RTGC divides women into ten groups based on parity, plurality, presentation, the start of labor, and gestational age.[9] This classification's advantages were that it was straightforward, similar, trustworthy, and adaptable.[10] This study aimed to identify and highlight the changing trends in cesarean deliveries in a tertiary hospital using the RTGC.

MATERIAL AND METHOD

This retrospective cohort study included 103745 patients who were admitted to Istanbul Kanuni Sultan Suleyman Training and Research Hospital's Obstetrics and Gynecology Department between January 1, 2012, and December 31, 2021. The characteristic features of patients, such as average age, the number of pregnancies, the history of prior cesarean sections, the number of birth, body mass index, and the indication for cesarean section, were assessed retrospectively. The information about the cases was obtained from the patient's files in the hospital archive and computer records.

Table 1 shows RTGC. Ten groups were established based on basic obstetric factors: parity (nulliparous, multiparous), previous cesarean section, labor initiation (natural, induced, or cesarean before labor starts), gestational age (less than 37 weeks, "preterm," more than 37 weeks, "term," the number of fetuses (single, multiple), and fetal presentation (head, breech, transverse). After classifying the deliveries into ten groups based on the year, the cesarean rates were estimated for all births per year for each of the ten groups.

The contribution of each Robson Group to the total cesarean rate for each year was calculated. In addition, each Robson Group's contribution to the shift in other total cesarean rates between the starting period of 2012 and the ending period of 2021 was compared. Patients with more than 20 weeks of gestational week or more than 500 grams of living or dead births were included in the study. Patients with less than 20 weeks of the gestational week or fewer than 500 grams of living or dead births were excluded from the study.

Statistical Analysis

Fisher's exact test, chi-square, and descriptive statistics such as mean and standard deviation were used to examine the data statistically. $p<0.05$ was the cutoff for statistical significance. The statistics were carried out using the SPSS Statistics for Windows, Version 24.0.

This study was approved by the ethics committee of Istanbul Kanuni Sultan Suleyman Training and Research Hospital. (KAEK/2022.10.217 Request Number).

RESULTS

The study enrolled a total of 103745 participants. The CS rate was 45.77% between 2012 and 2021. The CS rate increased slightly from 43,57% in 2012 to 47,47% in 2021, as shown in **Table 1** ($p>0.05$). Group 5 was the most significant contributor to the total CS rate. (multiparous, single, head presentation before uterine scar, greater than 37 weeks), which accounted for 20.61% of all CS. The second-highest contribution in the total CS rate was Robson group 3 (5.99%). The third highest contribution to the CS rate was Robson group 1 (5.75%) with nulliparous, single-head presentation, gestational age greater than 37 weeks, and spontaneous labor.

Table 1: Robson 10 group classification system

Group 1	Nulliparous, single, head presentation, greater than 37 weeks, spontaneous in labor.
Group 2	Nulliparous, single, head presentation, greater than 37 weeks, birth induction or cesarean section before the labor.
Group 3	Multiparous, no prior uterine scar, single, head presentation, greater than 37 weeks, spontaneous labor.
Group 4	Multiparous, no prior uterine scar, single, head presentation, induction before labor, or cesarean section.
Group 5	Multiparous, single, head presentation, prior uterine scar, greater than 37 weeks.
Group 6	Nulliparous, singular, breech presentation.
Group 7	Multiparous, single, with or without a prior uterine scar, breech presentation
Group 8	All multiple pregnancies, with or without a prior uterine scar.
Group 9	All pregnancies, single, transverse, or oblique presentation, with or without a prior uterine scar.
Group 10	All preterm births single, head presentation with or without a prior uterine scar.

All preterm births, single, head presentation, and either a previous uterine scar or not (group 10) constituted 5.60% of all CS. All women who presented breech, transversely, or obliquely (groups 6, 7, and 9) provided 2.41% of the total CS.

According to **Table 2**, the prior cesarean was the most frequent reason for a cesarean section (24.01%), followed by fetal distress (3.72%) and an abnormal presentation (3.59%).

Table 2: Evaluation of the CS rate between 2012 and 2021 using the RTGC

Groups 2012-2021	CS in the group	Number of women delivered	Group size* (%)	Group CS rate † (%)	Absolute group contribution to total CS rate ‡ (%)	Relative group contribution to all CS rate § (%)
1	5968	22116	21.31	26.98	5.75	12.57
2	2268	4228	4.07	53.65	2.18	4.78
3	6214	37899	36.53	16.40	5.99	13.08
4	1080	2972	2.86	36.34	1.04	2.27
5	21392	21467	20.69	99.65	20.62	45.04
6	1335	1368	1.32	97.59	1.29	2.81
7	1045	1121	1.08	93.22	1.00	2.20
8	2246	2515	2.42	89.30	2.16	4.73
9	125	127	0.12	98.42	0.12	0.26
10	5814	9932	9.57	58.54	5.60	12.25
Total*	47487	103745	100%		45.77 %	100%

*Group size (%) = number of women in the group / total number of women delivered in hospitals multiplied by 100
†Group CS rate (%) = number of CS in the group / total number of women multiplied by 100.
‡, Absolute contribution (%) = number of CS performed in the group / total women delivered in hospitals multiplied by 100.
§ Relative contribution (%) = number of CS performed in the group/ overall CS rate in the hospital, multiplied by 100

Table 3: Indications of cesarean sections

Indications	Number of Women (n)	Percent in Group (%)
Previous CS	24916	24.01
Fetal distress	3867	3.73
Abnormal presentation	3863	3.72
Cephalo pelvic distortion	3799	3.58
Prolonged labor	3149	3.02
Twin pregnancy	2496	2.38
Pregnancy-induced hypertension	2176	2.08
Macrosomia	1474	1.40
Placental abnormalities	1092	1.04
Other reasons	955	0.92
Total	47487	45.77

DISCUSSION

Our research shows that the average CS rate from 2012 to 2021 was 45.77%. Most cesarean sections were performed on members of Group 5, who were multiparous, single, head presenters, previously scarred uteri, and who were more than 37 weeks pregnant. Most cesarean deliveries (24.01%) were due to prior cesarean surgery. The largest size was in group 1, spontaneous labor, nulliparous, single, head presentation, more than 37 weeks.

To help analyze cesarean delivery rates, all healthcare providers can utilize the RTGC tool. It also acts as a reference for efforts in response to changes in the CS rate.[11] The average CS rate for this study was 45.77%, which was higher than the rates reported by Jain R,[12] (42.13%), RC Prameela et al.[13] (29.33%), and Sidara Gilani et al. (33.3%).[14] Due to its criteria, Group 5 contributes the most to the total CS rate. Researchers worldwide validated the most prevalent contribution, with findings ranging from 15.4% to 67.7%. Group 5 represented most of the total CS in our study (20.62%).[15-17]

In our study group, 3 was the largest group of in terms of all types of deliveries (group size: 36.34%) and the lowest CS rate (16.40%). Group 3 (multiparous women with a single fetus in a cephalic presentation who spontaneously went into labor at term) was the second highest contributor (5.99%) to the total CS rate. The multiparous women in group 3 are a low-risk obstetric population and therefore, more likely to give birth vaginally. It is reasonable to assume that this group has a low CS rate. The CS rate in (group 3) was found to be 9.7% by Arpita Y et al.[18] and 2.6% by Tahira Kazmi et al.[19]

In this study, the Robson group 1 was the second-largest group (21.31%) and the third-highest contributor (5.75%) to the total cesarean section rate. Before spontaneous or artificially induced labor started, ultrasound was utilized to evaluate pregnant women. A cesarean section was typically performed on the patient when fetal macrosomia was suspected or predicted to exceed 4000 grams. Additionally, an elevated cesarean rate in Robson was linked to non-reactive stress test (NST) results. Khan MA et al.[20] reported that groups 5, 2, and 10 contributed most to the total CS rates. Parveen et al.[21] reported that groups 10 and 5 were the groups that contributed the most overall CS rate. Bolognani, C. Vet al.[22] reported that groups 5, 1, and 2 contributed the most to the overall CS rate. In groups 6 and 7 (breech presentation), the cesarean section rates exceeded those noted in the literature.[23,24] The lack of an external cephalic version in our clinic during the preterm period and potential medico-legal issues that could arise in breech birth may be the causes of these rates. In our study, major CS indication was a previous cesarean section, similar to other studies.[25,26]

Strengths and Limitations of the Study: The data were meticulously collected, and the sample size was sufficient compared to the literature studies. This study determined the importance of experience which could be beneficial to each group. This study was conducted at a single center, limiting generalization.

CONCLUSION

Reducing cesarean rates, which have been high for years, is only possible with multidisciplinary studies. For this purpose, clinical practices should be combined with evidence-based

practices. Therefore, indications such as fetal distress, non-progressive labor, and cephalopelvic discordance, which constitute the majority of cesarean section indications, should be based on more objective criteria.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of Istanbul Kanuni Sultan Süleyman Training and Research Hospital Ethics Committee (Date: 28.10.2022, Decision No: KAEK/2022.10.217).

Informed Consent: Because the study was designed retrospectively, no written informed consent form was obtained from patients.

Referee Evaluation Process: Externally peer-reviewed.

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