


■ Original Article

Distribution of Deliveries According to Robson Classification: Experiences in Tertiary Care

Doğumların Robson Sınıflamasına Göre Dağılımı: Üçüncü Basamak Deneyimi

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Abstract

Objective: In this study, we aimed to evaluate the cesarean deliveries performed in the obstetrics clinic of our hospital according to the Robson classification and to determine the Robson group affecting the cesarean section rates.

Methods: The aim of the study was to retrospectively analyse cesarean deliveries in patients who applied to Ankara Ataturk Sanatorium Training and Research Hospital and whose deliveries were performed by using the Robson Ten Group Classification System. Our study group included pregnant women who were admitted to the delivery room of our hospital, who gave birth in our hospital and who did not have any obstetric risk factors. Demographic data of the patients were obtained from hospital records.

Results: According to the inclusion criteria, the data of 550 of these patients were evaluated. Accordingly, 249 of the deliveries were by caesarean section. The rate of caesarean section among all deliveries was 45.3%. 6.80% of the pregnant women who delivered by caesarean section were in the first group according to Robson classification (nulliparous, head presentation, ≥ 37 weeks, singleton, spontaneous onset of trauma) and 12.0% were in the second group according to Robson classification (nulliparous, head presentation, ≥ 37 weeks, induced or induced caesarean section before the onset of trauma, singleton).

Conclusion: The cesarean section rate in Turkey was 54.4% and the primary cesarean section rate was 26.5%. The risk of maternal morbidity and mortality and perinatal morbidity increases after an off-label caesarean section, leading to negative consequences in terms of maternal, neonatal and economic health.

Keywords: Caesarean section; Robson classification; Turkey; birth rates

Öz

Amaç: Bu çalışma ile hastanemiz doğum kliniğinde gerçekleşen sezaryan doğumlarının Robson sınıflandırmasına göre değerlendirmeyi ve sezaryan oranlarına etki eden Robson grubunu tesbit etmeyi amaçladık.

Gereç ve Yöntem: Çalışma, retrospektif olarak Ankara Atatürk Sanatoryum Eğitim ve Araştırma Hastanesine başvurmuş ve doğumunu gerçekleştirdiğimiz hastalarda sezaryen doğumların Robson On Gruplu Sınıflandırma Sistemi kullanılarak analiz edilmesi amaçlanmıştır. Çalışma grubumuz hastanemiz doğum salonuna kabul edilmiş, hastanemizde doğum yapmış olan ve herhangi bir obstetrik risk faktörü olmayan gebeleri kapsamaktadır. Hastaların demografik verileri hastane kayıtlarından alınmıştır.

Bulgular: Çalışmaya dahil olma kriterlerine göre bu hastaların 550'ine ait veriler değerlendirmeye alınmıştır. Buna göre, doğumların 249'u sezaryen doğum ile gerçekleşmiştir. Tüm doğumlar içerisinde sezaryen doğum oranı %45.3'dür. Sezaryen ile doğum gerçekleştiren gebelerin 6.80%'lik kısmı Robson sınıflandırmasına göre birinci grupta (Nullipar, baş gelişi, ≥ 37 hafta, tekil, travayı spontan başlamış), 12.0%'si Robson sınıflandırılmasında ikinci grupta (nullipar, baş gelişi, ≥ 37 hafta, indüklenmiş ya da travay başlamadan önce sezaryen yapılmış, tekil) yer almıştır.

Sonuç: Türkiye geneli sezaryen doğum oranı %54,4 ve primer sezaryen doğum oranı %26.5'dir. Endikasyon dışı sezaryen doğum sonrasında maternal morbidite ve mortalite ile perinatal morbidite riski artmakta ve bu durum hem anne hem yenidoğan sağlığı hem de ekonomik açıdan olumsuz sonuçlara yol açmaktadır.

Anahtar Kelimeler: Sezaryan doğum; Robson sınıflandırması; Türkiye; doğum oranları

1. Introduction

Cesarean section is one of the most commonly performed surgical procedures worldwide and is defined as the delivery of the fetus through an abdominal incision followed by a uterine incision (1). A cesarean section is usually performed when vaginal delivery cannot be performed safely and there is an increased risk of morbidity and mortality for the mother and/or baby. Since 1985, the international health community has assumed that the ideal cesarean section rate should be 10-15% of all deliveries. Today, the incidence of cesarean sections is increasing rapidly worldwide, particularly in middle- and high-income countries (2,3).

The number of deliveries by cesarean section is gradually increasing in our country as in the whole world, and one of the main reasons for this increase is elective cesarean sections, which are performed according to the motto "once a cesarean section, always a cesarean section". Vaginal delivery after cesarean section is now practiced in many countries and the standards for vaginal delivery after cesarean section in our country are set out in the 2010 Department of Health guidelines for the management of childbirth and cesarean section.

As with any surgical procedure, there are short and long-term risks following a cesarean section. Studies have shown that a cesarean section rate of over 10% is not associated with a reduction in maternal and neonatal mortality (4). The cesarean section rate has been gradually increased over the last decade and it is an important but difficult issue to uncover the reasons

for this increase, to determine the cesarean section rate and to calculate the lowest cesarean section rate when necessary by avoiding medically unnecessary interventions.

The World Health Organization (WHO) has proposed an internationally applicable, clinically valid and meaningful Robson's Ten Group Classification System (ROGSS) to reduce cesarean section rates. This classification system is prospective and eliminates controversial situations that are uncertain in cesarean section decisions. The classification categorizes pregnant women into 10 different groups based on 5 basic obstetric parameters derived from prenatal, intrapartum and postnatal data. These parameters are parity (nulliparous, multiparous), previous cesarean sections, onset of labor (spontaneous, induced or preterm), duration of pregnancy (preterm or term), fetal position (cephalic, breech or transverse) and number of fetuses (single or multiple). The classification, which is objective, reproducible, easy to understand and suitable for clinical use, helps to compare cesarean section rates and determine the factors that cause cesarean section (5,6). The number of cesarean deliveries is gradually increasing in our country as in the whole world, and one of the most important reasons for this increase is elective cesarean deliveries, which are performed according to the motto "once a cesarean, always a cesarean". Vaginal birth after cesarean section is now used in many countries, and the standards for vaginal birth after cesarean section were established in our country in 2010 in the Ministry of Health's Guide to the Management of Births and Cesarean Sections.

The aim of this study was to evaluate the cesarean deliveries performed in the Obstetrics and Gynecology Clinic of our hospital according to the Robson classification and to determine the Robson group that affects cesarean section rates.

2. Materials and Methods

We conducted a retrospective, case-controlled observational study of patients who were cared for and delivered at the Ankara Ataturk Sanatorium Research and Teaching Hospital Obstetrics Clinic. The ethics committee for non-interventional studies of Ankara Ataturk Sanatorium Research and Teaching Hospital gave its approval before the start of the study (approval date: 28/02/2024, issue no.: 38/2024).

The aim of the study was to retrospectively analyze cesarean deliveries in patients who were registered at Ankara Ataturk Sanatorium Training and Research Hospital and whose deliveries were performed according to the Robson Ten Group Classification System. Our study group included pregnant women who were admitted to the delivery room of our hospital, who delivered in our hospital and who had no obstetric risk

factors. Patients with fetal anomalies, diagnosis of chronic disease in the mother, dead fetuses, abnormalities of the placenta, maternal age less than 22 and more than 49 years, pregnancy with assisted reproductive technology, smoking history, and patients admitted to the hospital and referred for delivery were excluded. Thus, 632 records from the last year were analyzed (Figure 1).

The patients' data were analyzed using the delivery records and the hospital information system. The data were collected using the list of patients and delivery methods from the delivery records, the characteristics recorded in the hospital information system (demographic characteristics, life history, family history, follow-up characteristics) and the information in the delivery records. Patients were categorized according to the Robson On classification (Table 1) (6).

Statistical analysis

All statistical analyzes were performed using the SPSS 25.0 package program (SPSS Inc, Chicago, IL). The Shapiro-Wilk test was used to check the conformity of continuous numerical

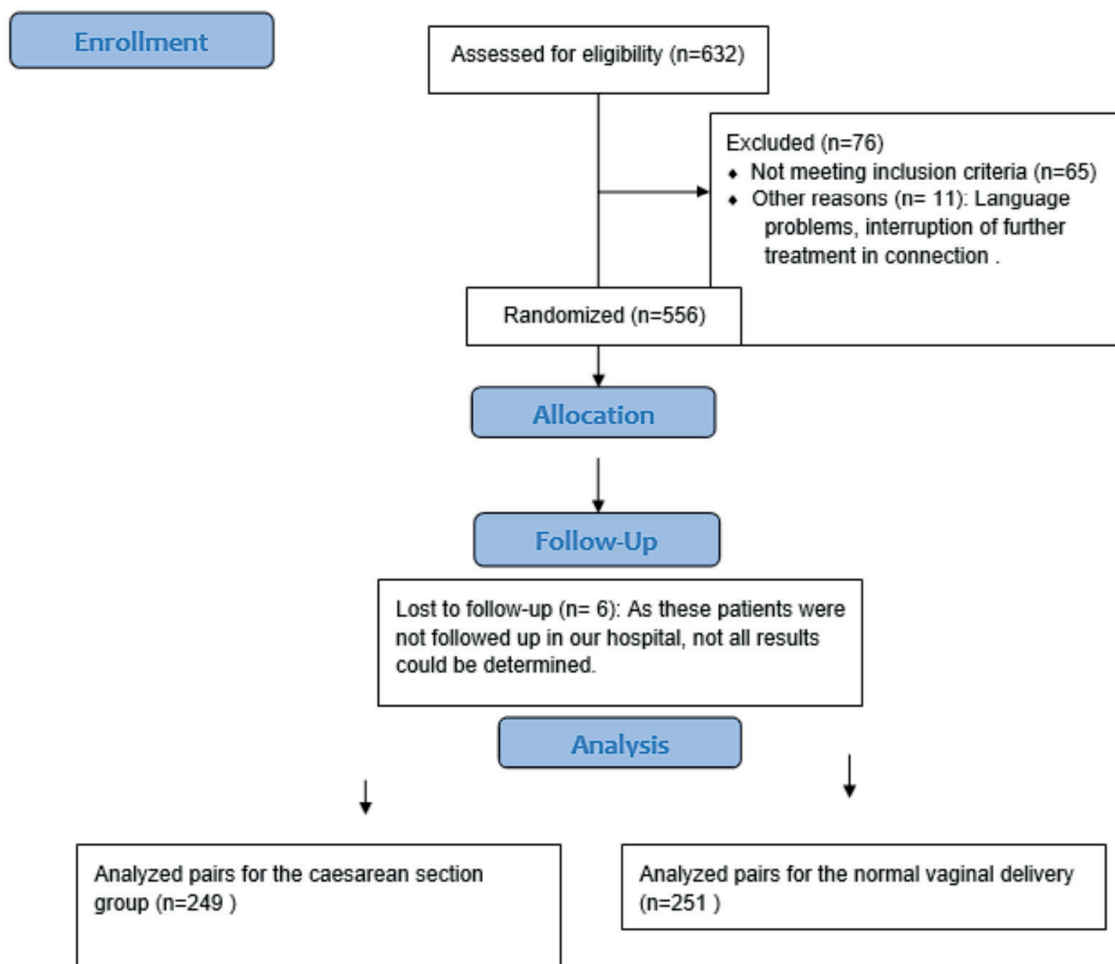


Figure 1. Flow chart of the study

Table 1. Description of Robson Classification

Groups	Description
Group 1	Nulliparous, single cephalic, ≥ 37 weeks, spontaneous labor
Group 2	Nulliparous, single cephalic, ≥ 37 weeks, induced or cesarean before labor
Group 3	Multiparous (excluding previous cesareans), single cephalic, ≥ 37 weeks, spontaneous labor
Group 4	Multiparous (excluding previous cesareans), single cephalic, ≥ 37 weeks, induced or cesarean before labor
Group 5	Previous cesarean, single cephalic ≥ 37 weeks
Group 6	All nulliparous breeches
Group 7	All multiparous breeches (including previous cesareans)
Group 8	All multiple pregnancies (including previous cesareans)
Group 9	All abnormal lies (including previous cesareans)
Group 10	All single cephalic, ≤ 36 weeks (including previous cesareans)

variables to the normal distribution. Quantitative variables were expressed as mean \pm standard deviation, median (minimum-maximum) and qualitative variables as relative frequency (%). The Kruskal-Wallis test was used to compare non-normally distributed parametric variables for the three groups. For normally distributed variables, a one-way ANOVA was performed to compare between groups. The Mann Whitney U-test and Student t-test were used to compare parametric variables in two groups with and without normal distribution, respectively. The Pearson chi-square test was used to compare categorical variables between groups. The P-value < 0.05 was considered statistically significant.

3. Results

The study analyzed data from 632 deliveries. In accordance with the inclusion criteria, data from 550 of these patients were analyzed. Accordingly, 249 of the deliveries were performed by cesarean section. The cesarean section rate among all deliveries was 45.3 % (Table 2). The demographic data of the patients included in the study are listed in Table 3. The average age of the patients was 23.2 ± 5.6 years. The body mass index was 26.1 ± 4.9 kg/m². Of the patients included in the study, 145 (26.3%) gave birth for the first time. 65 (11.8%) of the patients had given birth before the 37th week of pregnancy.

According to the Robson classification, 6.80% of pregnant women who had delivered by cesarean section belonged to the first group (nulliparous, cephalic, ≥ 37 weeks, singleton delivery, spontaneous onset of trauma) and 12.0% to the second group (nulliparous, cephalic, ≥ 37 weeks, induced or cesarean section before onset of trauma, singleton delivery) (Table 4). 5.60% of pregnant women who delivered by cesarean section belonged

Table 2. Distribution of all deliveries in our clinic

Type of delivery	Number	Percentage
Vaginal delivery	301	54.7%
Cesarean section	249	45.3%
Total	550	100.0%

Table 3. Demographic characteristics of patients

	Study Group N=550
Age (years)	23.2 ± 5.6
Body Mass Index (kg/m ²)	26.1 ± 4.9
Parity	
0	145 (26.3%)
1	326 (59.4%)
≥ 2	79 (14.3%)
Smoking	
Yes	157 (28.5%)
No	398 (72.4%)
Assisted reproductive techniques	
Yes	11 (2.0%)
No	539 (98.0%)
Gestational week at delivery	
< 37 weeks	65 (11.8%)
37-42 weeks	476 (86.5%)
> 42 weeks	19 (2.7%)



Table 4. Distribution of birth types according to the Robson Ten Group Classification System

Robson Group	Normal deliveries (n)	Percentage (%)	Cesarean section (n)	Percentage (%)	Total (n)	Percentage (%)
Group 1	55	18,30%	17	6,80%	72	13,10%
Group 2	21	7.00%	30	12.00%	51	9.30%
Group 3	139	46.20%	14	5.60%	153	27.80%
Group 4	54	17.90%	7	2.80%	61	11.10%
Group 5	0	0.00%	119	47.80%	119	21.60%
Group 6	0	0.00%	10	4.00%	10	1.80%
Group 7	0	0.00%	10	4.00%	10	1.80%
Group 8	0	0.00%	6	2.40%	6	1.10%
Group 9	0	0.00%	3	1.20%	3	0.05%
Group 10	32	10.60%	33	13.30%	65	11.80%

to the third group [multiparous (no previous cesarean section), cephalic, singleton, ≥ 37 weeks, spontaneous onset of trauma] and 2.80% belonged to the fourth group [multiparous (no previous cesarean section), cephalic, ≥ 37 weeks, induced or induced cesarean section before onset, singleton] according to the Robson classification. The proportion of group 5 (previous cesarean, cephalic, singleton, ≥ 37 weeks' gestation), group 6 (all nulliparous breech deliveries), and group 7 (all multiple breech deliveries, including previous cesarean) among all cesarean deliveries was 47.80%, 4.0%, and 4.0%, respectively. According to Robson's classification, group 9 (all transverse presentations, including previous cesarean sections) accounted for 2.40% of all cesarean births.

4. Discussion

In our one-year study, in which 45.3% of deliveries in our hospital's training clinic were cesarean sections and 632 deliveries were analyzed, cesarean section rates were assessed using the Robson Ten Group Classification System (7). The World Health Organization recommends a cesarean section rate between 10% and 15% in health facilities (8). According to the Turkish Health Statistics data (2019), the cesarean section rate in Turkey was 54.4% and the primary cesarean section rate was calculated as 26.5% (9). The risk of maternal morbidity and mortality and perinatal morbidity increases after an unwanted cesarean section, which has negative consequences for maternal and neonatal health and the economy (10).

To increase the number of normal vaginal deliveries and reduce the cesarean section rate, it is necessary in our country to wait for the spontaneous onset of labor (reduction of induction), increase the use of the partograph, avoid continuous electronic

fetal monitoring in low-risk pregnant women, manage labor spontaneously, and provide one-to-one care by midwives and nurses for normal labor motivation. Spontaneous labor management carries fewer risks than interventions during labor

To achieve the cesarean section rates recommended by the WHO, the Robson Ten-Group Classification System must be managed effectively. This classification system makes it possible to categorize pregnant women into groups according to their obstetric characteristics, to compare cesarean section rates between the groups and to determine the components that lead to a cesarean section. Group 5 (previous uterine surgery) is the largest contributor to cesarean section rates, and reducing primary cesarean section rates can be seen as the most important step in reducing cesarean section rates. In breech and multiple pregnancies, vaginal delivery should be attempted under appropriate conditions, the rate of operative vaginal deliveries should be increased, indications such as fetal distress, non-progressing labor, craniopelvic incompatibility should be based on clearer and more objective criteria.

In all studies on indications for cesarean section, previous uterine surgery was mentioned as the most important indication (11). In our study, the most common indication for cesarean section was previous uterine surgery, accounting for 47.8% of all cesarean sections (group 5).

Although it has been reported that vaginal delivery is possible for patients who have previously undergone cesarean section through a transverse lower segment incision in centers that provide the conditions for monitoring during active labor and performing cesarean section under emergency conditions if they have appropriate pelvic anatomy and the fetus weighs

less than 4000 grams, the possibility of vaginal delivery after cesarean section remains limited in our country due to medico-legal concerns (12).

In our study, the cesarean section rate in group 1 was 6.80%. In a study conducted in our country in 2023, the cesarean section rate in Robson's group 1 was 21.31% (13). One of the most common indications for primary cesarean section is fetal distress, and with the increase in electronic fetal monitoring, an increase in the cesarean section rate has been observed (14). Some studies have shown that continuous electronic fetal monitoring in low-risk pregnancies does not provide any additional benefit in terms of perinatal mortality and morbidity, but on the contrary increases the cesarean section rate (15). Careless and inadequate fetal monitoring in an attempt to reduce the increase in cesarean section rate may also lead to poor obstetric outcomes.

Encouraging expectant mothers to have a vaginal delivery, making antenatal education a routine part of regular antenatal care, informing them about the advantages and disadvantages of vaginal delivery and cesarean section, and ensuring that they have sufficient knowledge about delivery will play an important role in reducing the rate of cesarean sections at the request of mothers. In most industrialized countries where the cesarean section rate is low, optimal prenatal care is offered and women receive skilled and high quality care, follow-up, education and counseling from prenatal care to the postpartum period. This approach contributes significantly to keeping the cesarean section rate at the level recommended by the WHO. Our clinic provides the necessary training and precautions in this regard, and our postnatal patients are informed about delivery.

Due to the recent increase in malpractice lawsuits, obstetricians and gynecologists in particular prefer C-sections, which are easier and less risky. It was found that a significant majority of women suffered from labor pain and anxiety because they were not adequately informed and therefore preferred a C-section.

Excessive obesity, advanced age pregnancies, systemic diseases, dietary changes and reduced physical activity increase the risk of high-risk pregnancies and affect the rates of cesarean section due to systemic causes and dystocia.

In our country, many different institutions and associations, especially the Ministry of Health, carry out various activities to reduce the cesarean section rate during the labor process, and the Robson Ten Group Classification System is routinely used to classify cesarean sections (7). In Turkey, as in the rest of the world, the rate of cesarean sections is increasing due to the expectant mother's belief that a cesarean section is safer,

the medical profession's belief that the expectant mother and baby are exposed to fewer risks during a cesarean section, the development of technology and surgical techniques, the use of antibiotics and blood transfusions, and the increase in the safety of anesthesia methods. Further research is needed to determine the rate of cesarean sections in Turkey and the factors affecting this rate. In our country, health records should be kept in more detail and all health movements and records of the population served by primary care should be recorded in more detail and these records should be used to improve cesarean section rates. By using the Robson Ten Group Classification System in monitoring cesarean section rates, both developing and developed countries can easily analyze their countries and make decisions on a country-by-country basis to achieve the target cesarean section rate.

Author contribution

Study conception and design: CT, BMS and EY; data collection: CT, BMS and EY; analysis and interpretation of results: CT, BMS and EY; draft manuscript preparation: CT, BMS and EY All authors reviewed the results and approved the final version of the manuscript.

Ethical approval

The study was approved by the Ethics Committee for Noninterventional Studies of Ankara Atatürk Sanatoryum Research Hospital (Protocol no. 38/2024 28/02/2024).

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Conflict of interest

The authors declare that there is no conflict of interest.

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