Comparison of Robson Classification in adolescent pregnant with adult pregnant

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ABSTRACT

The number of cesarean sections performed worldwide is increasing day by day. Establishing a common classification system for cesarean births is important in understanding what factors lead to the increase in these procedures. The aim of our study is to identify trends in adolescent cesarean births by applying the Robson classification, compare them with the adult group, and examine the groups that make the most significant contribution to the increasing rates.

This retrospective cohort study documented information on birth weight, mode of delivery, gestational age at birth, parity, maternal gestational age, cesarean indications, and ten-group Robson Classification in pregnant adults and adolescents.

The cesarean section rate in adult pregnant women was 39.4%, and the cesarean section rate in adolescents was 14.8%. Group 5 made the biggest contribution to cesarean section rates in both the adult group and the adolescent group. Group 5 was statistically significantly higher in adult cesarean deliveries ($p= .001$). Other groups where adult cesarean section was significantly more common were group 3 and group 8 (8%; p=0.009, 4.4% p=0.001, respectively). In adolescent cesarean delivery, significant cesarean contributions in group 1, group 2 and group 6 were higher in the adolescent group (23.5%; $p= .001$, 16.3%; $p= .001$, 16.3%; $p= .001$).

The contribution of adult pregnant women and adolescent pregnant women to cesarean section rates varies. This study reveals the need for trained health personnel who are prepared and scheduled to attend teenage births.

Keywords: Adolescent pregnant, adult pregnant, cesarean section rate, Robson Classification

Introduction

Globally, the number of cesarean sections performed is rising daily. The overall rate of cesarean sections is currently estimated to be around 32.1% (1). While indication-based cesarean deliveries, which are more common in developed nations, lower perinatal morbidity and mortality, performing cesarean sections without a medical or obstetric indication can have detrimental effects on the mother and/or baby and increase the expense of financial resources (such as more hospital stays, human resources, etc.) (2,3,4). For many factors, patient preferences or characteristics, physician conduct, and hospital guidelines, there are disparities in the incidence of cesarean section between organizations, regions, and countries (5,6,7). A suitable classification method is required to assess the rising trend in the cesarean section rate, as the World Health

Organization recommends that the rate should not exceed 10% to 15% (8). Furthermore, creating a common classification system for cesarean sections is crucial to figuring out what factors led to the increase in these procedures, utilizing accurate measuring methods, and making suggestions for improvement (8,9,10). In the Robson Classification proposed in 2001, 5 basic birth characteristics are evaluated in 10 different groups, allowing analysis between groups (11). These analyses enable the discrimination of patients at different risks in different populations, allowing comparison within the group and the most important expectation of the classification is to ensure the lowest maternal and fetal mortality and morbidity (12).

Adolescent pregnancy is the term used to describe pregnancies among teenagers between the ages of 10 and 19 (13,14). Adolescent pregnancies are regarded as serious medical problems that

contribute to 11% of births and 23% of pregnancy-related complications globally (15). In addition, the possibility of receiving prenatal care decreases in adolescent pregnancies, and the risk of preterm birth or low birth weight increases (16). Despite this, the rate of primary cesarean section in adolescent pregnancy has been reported to be 18% (17). Studies have shown that cesarean section rates are significantly higher in non-adolescent women than in adolescent pregnant women, but the indication distributions were found to be similar (18).

The aim of our study is to apply the Robson Classification to identify trends in adolescent cesarean births, compare them with the adult group, and examine the groups that are key contributors to the increasing rates.

Material and Methods

Data sources and study design: This retrospective cohort study examined procedures performed at tertiary healthcare centers between January 2020 and April 2024. The local ethics committee and review board gave its approval to the study (E-46059653-050.99-244272132) and performed under the Declaration of Helsinki.

The pregnant adults in this study were over the age of 20, whereas all of the pregnant adolescents were 19 years of age or younger. The study did not include pregnant women who had stillbirths, babies weighing less than 500 grams, or women whose gestational age was less than 22 weeks. In addition, information was documented about the birth weight, manner of delivery, gestational age at birth, parity, gestational age of the mother, signs of a cesarean section, and the ten-group Robson Classification. There are ten thorough, evidence-based, and mutually exclusive subgroups in the Robson-10 group classification (11, 19).

In this study, we compared the Robson groups between adolescent pregnant women and adult pregnant women and evaluated the groups that have the greatest impact on cesarean sections.

Statistical analysis: Data analysis was performed using IBM SPSS version 22.0 (IBM, Armonk, NY, USA). The conformity of the variables to the normal distribution was evaluated with the Shapiro-Wilk test, Q-Q plot and histogram graphics. Since continuous data did not show a normal distribution according to the Shapiro-Wilks test, continuous variables were expressed as median (minimum-maximum) and categorical variables were expressed as numbers and percentages. Non-parametric values were compared with the Mann-Whitney U test, and categorical variables were compared with the Chi-square test. Two-tailed P values < .05 were considered statistically significant. Power analysis, we used G*Power version 3.1 14 (Heinrich Heine University, Germany).

Results

The files of a total of 19249 women who gave birth were examined retrospectively, and 6938 adults who had a cesarean section and 221 adolescents who had a cesarean section were included in the research. The flow chart is shown in Figure 1. While the cesarean section rate in adult pregnant women was 39.4%, the cesarean section rate in adolescents was 14.8%. According to the Robson Classification, group 5 made the most contribution to cesarean section rates in both the adult group and the adolescent group, while group 7 made the least contribution to cesarean section rates in adults, and group 8 made the least contribution to cesarean section rates in adolescents.

Comparison of the two groups' demographics revealed a statistically significant difference in gravity and parity, but there was no statistical difference in gestational age at birth. Other demographic characteristics are summarized in Table 1. Groups of adults and adolescents were compared according to the Robson Classification. There was a statistical difference between group 1, group 2, group 3, group 5, group 6, and group 8. More than half (62%) of adult cesarean births occurred in group 5, and there were statistically significantly more cesarean births in group 5 than adolescent pregnancies (*p= .001*). The other groups in which adult cesarean sections were significantly more common were group 3 and group 8 (8%; *p=.009*, 4.4% *p=.001*, respectively). On the other hand, the cesarean contributions in group 1, group 2, and group 6, which were significant in adolescent cesarean section, were higher in the adolescent group (23.5%; *p= .001*, 16.3%; *p= .001*, 16.3%; *p= .001*, respectively). The contribution of all groups of the Robson 10-group classification system to the cesarean section rate in adults and adolescents is shown in Table 2.

The distribution of adult and adolescent cesarean section indications was examined, and it was seen that the most common previous cesarean birth was the most common in both groups and fetal distress was the second most common. Other cesarean section indications are shown in Table 3.
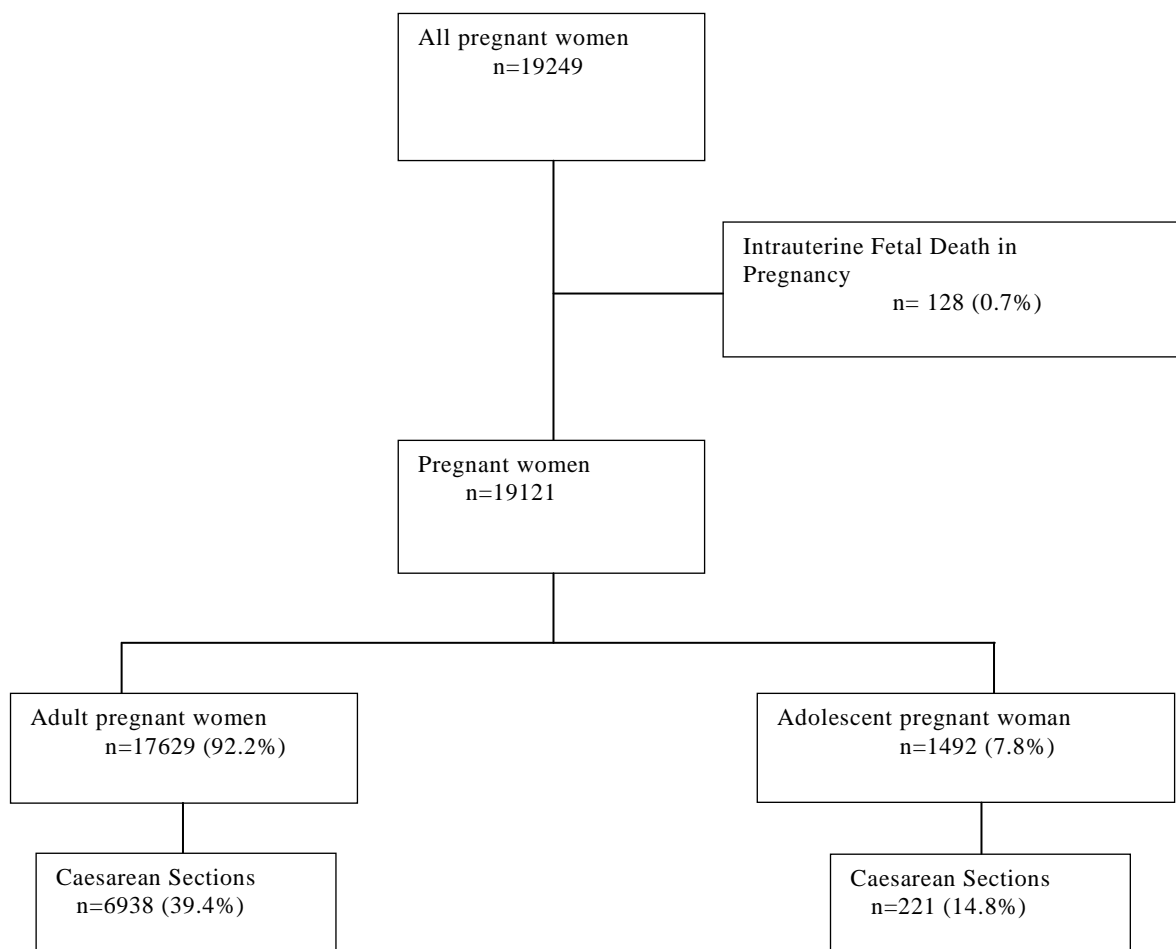
Fig. 1. Flow Diagram

Discussion

The increasing rate of cesarean births day by day is a source of concern all over the world. To prevent this, it is necessary to evaluate why the indications for cesarean sections are increasing. Using Robson criteria to assess cesarean section rates and indications is recommended (20). In our study, similar to the literature, the most common cesarean section criterion is met by Group 5, which requires previous cesarean delivery in both adolescent and adult groups, single, head, and, ≥37 weeks (21).

Group 5 is most common in both adolescent and adult groups. Unlike the adult group, groups 1, 2, and 6 were observed at higher rates in the adolescent group. It is thought that the reason for the high rate of Robson Group 5 in both groups is to avoid the possibility of uterine rupture in vaginal delivery after cesarean section. This clearly shows that as cesarean birth rates increase, the risk of future pregnancies ending in cesarean section also increases (22). It has been observed in other studies that the risk of death, intensive care unit admission, blood transfusion, and hysterectomy increases when cesarean births are compared with spontaneous vaginal birth (23). For this reason, since the previous cesarean indication is one of the strongest reasons for requiring a repeat cesarean section, more care should be taken in primary cesarean indications (24). Similarly, the American College of Obstetricians and Gynecologists (ACOG) advises avoiding induction of labor before 39 weeks and waiting for the active labor phase to reduce cesarean section rates due to non-progressive labor (25). Likewise, cesarean delivery is increasing day by day in adolescent pregnancies, and the probability of cesarean section in subsequent pregnancies is close to 90% (26).

In our study, the rates of cesarean sections performed due to unsuccessful induction and fetal distress were observed to be higher in adolescents. Studies have reported that intrauterine growth restriction and oligohydramnios perinatal complications are common in adolescent

Table 1: Demographic Characteristics

	Adult pregnant women n=6938	Adolescent pregnant woman n=221	p
Age (years) median ± IQR	29±8	19±1	***.001***
Gravidity median ± IQR	2±1	1±1	***.001***
Parity median ± IQR	1±1	0±1	***.001***
Gestational week median ± IQR	39±2	39±2	.080
Birth weight (g) median ± IQR	3120±758	3215±700	.099

Mann-Whitney U

Table 2: Contribution of Robson 10 Group Classification System To Cesarean Section Rate

No	Robson group	Contribution to cesarean section in adults(%)	Contribution to cesarean section in adolescents(%)	p
1	Nulliparous, single cephalic pregnancy, ≥37 wk, spontaneous labor	7.8	23.5	***.001***
2	Nulliparous, single cephalic pregnancy, ≥37 wk, labor induction, or prelabor cesarean	3.8	16.3	***.001***
3	Multiparous, single cephalic pregnancy, ≥37 wk, spontaneous labor	8.0	3.2	***.009***
4	Multiparous, single cephalic pregnancy, ≥37 wk, labor induction, or prelabor cesarean	2.2	1.8	.683
5	Multiparous, previous cesarean, single cephalic pregnancy, ≥37 wk gestation	62.0	28.5	***.001***
6	Nulliparous, single breech pregnancy	1.9	16.3	***.001***
7	Multiparous, single breech pregnancy	1.8	1.4	.654
8	All multifetal pregnancies	4.4	0.0	***.001***
9	All pregnancies with transverse lie	2.7	0.9	.106
10	All single cephalic pregnancies at <37 wk, gestation	5.5	8.1	.091

Chi-Square Test

pregnancies (15). Oligohydramniosis and fetal growth restriction increase both induction rates and cesarean section rates (27,28,29). It is also known that induction applications also increase cesarean section rates (27).

Fetal distress is also the second most frequent cause of cesarean delivery in both populations. We believe that this is because more fetal distress-related cesarean deliveries are occurring as a result of the increased use of electronic fetal monitoring. According to comprehensive research, there was no incremental advantage in terms of perinatal mortality and morbidity when continuous electronic fetal monitoring was used in low-risk pregnancies. On the contrary, the rate of cesarean section increased by almost 20% (28). The non-stress test (NST), which is frequently employed in antepartum assessment, is unreliable in predicting the requirement for neonatal intensive care and has a high false-positive rate (30). Nonetheless, there are also studies in the literature that show the non-stress test (NST), which is used to assess fetal well-being during the latent phase, is a reliable method of predicting fetal problems (31). Poor obstetric outcomes will also result from negligent and insufficient fetal follow-up intended to lower the rise in cesarean section rates.

Defensiveness towards medical procedures has increased significantly in recent years. For example, it seems that the external cephalic version and vacuum-forceps applications have decreased significantly (32,33). As a result, an

Table 3: Distribution of Cesarean Section Indications

Distribution of cesarean section indications	Adult pregnant women n=6938	Adolescent pregnant woman n=221	p
Failed induction	110 (1.6%)	16 (7.2%)	*.001*
Malpresentation	442 (6.3%)	44 (19.9%)	*.001*
Umbilical cord prolapse	11 (0.2%)	2 (0.9%)	*.010*
Fetal macrosomia	359 (5.2%)	20 (9%)	*.011*
Previous cesarean birth	4718 (68%)	66 (29.9%)	*.001*
Fetal distress	809 (11.7%)	60 (27.1%)	*.001*
Placental abruption	43 (0.6%)	0 (0%)	.240
Placenta previa, placenta accreta	37 (0.5%)	1 (0.5%)	.871
Preeclampsia	114 (1.6%)	6 (2.7%)	.222
Eclampsia	27 (0.4%)	0 (0%)	.353
Multiple pregnancy	225 (3.2%)	6 (2.7%)	.662
Cephalopelvic disproportion	43 (0.6%)	0 (0%)	.240

Chi-Square Test

increase in primary cesarean section rates is observed in both groups and, accordingly, an increase in the number of reasons for cesarean section due to previous cesarean section in the future.

The fact that gravity and parity are higher in the adult group than in the adolescent group is the reason for the difference between group 1 and group 3. Group 6 is seen statistically significantly more frequently in adolescents. We think that the reason for this is that the number of nulliparous pregnancies is higher in adolescents, and obstetricians tend to perform more cesarean sections in nulliparous pregnancies in cases of breech presentation. Our study offers some strengths and limitations. The study's strength lies in the sheer number of pregnant women that it covered, as well as the fact that no other research in the literature makes the Robson Classification of adolescent pregnancies. The limitation of the study is that the groups were designed retrospectively. Additionally, the fact that our study was conducted in a tertiary hospital that accepts risky pregnancies may have affected the results of our study by increasing the cesarean section rates during the reproductive period.

In conclusion, the contribution of adult pregnant women and adolescent pregnant women to cesarean section rates varies. This study reveals the need for trained health personnel who are prepared and scheduled to attend teenage births. It is important to disseminate information about vaginal birth, apply effective relaxation techniques such as deep breathing under the supervision of midwives and nurses, and remember that adolescents are a sensitive demographic group and some perinatal complications are more common, and precautions should be taken accordingly.

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