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Comparison of Pregnancy Outcomes Among Adolescent Pregnant Women, Young Adult Pregnant Women, and Adult Pregnant Women Over Ten Years in Our Tertiary Care Clinic

Üçüncü Basamak Olan Kliniğimizde On Yıl Boyunca Adolesan Gebeler, Genç Yetişkin Gebeler ve Yetişkin Gebelerin Arasında Gebelik Sonuçlarının Karşılaştırılması

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Abstract

Aim: In this study, we aimed to compare the results of adolescent pregnancies, which we think is a big problem for our country, with young and adult pregnant women.

Material and Method: We included 15705 individuals in our retrospective cohort study. In our study, the adolescent pregnant group was 5235 people, the young adult group was 5235, and the adult group was 5235. We conducted the study with patients who gave birth in our tertiary care center between January 2012 and April 2022. We complied with the Declaration of Helsinki at all stages of the study. In the study, we compared the demographic data of the groups with the maternal and fetal outcomes of pregnancy, delivery, and postpartum. We performed a One-Way Analysis of Variance (ANOVA) to compare group means. We used odds ratio calculation to determine risk ratios between groups. We used SPSS for Windows 24.0 (SPSS Inc., Chicago, IL, USA) for the analyses. We presented the data as mean, standard deviation, and ratio and considered them statistically significant when the p value was less than 0.05.

Results: Our study observed that the risk of having PROM in adolescent pregnant women increased approximately two times compared to adult pregnant women (aOR=01.987, 95%CI=1.197-2454, p=0.001). When we researched the IUGR results, we found that the risk increased approximately two times in adolescent pregnant women (aOR=2.129, 95%CI=1.754-2.947, p<0.0001).

Conclusion: It is understood from the study that some adverse events related to pregnancy increase in adolescent pregnancy. For this reason, although preventing adolescent pregnancies is impossible, the follow-up of these pregnancies should be done more frequently and carefully than routinely.

Keywords: Adolescent, pregnancy, young adult, adult, outcomes

Öz

Amaç: Bu çalışmada ülkemiz için büyük bir sorun olduğunu düşündüğümüz adölesan gebelik sonuçlarını genç ve erişkin gebelerle karşılaştırmayı amaçladık.

Gereç ve Yöntem: Retrospektif kohort çalışmamıza 15705 birey dahil ettik. Çalışmamızda adölesan gebe grubu 5235 kişi, genç yetişkin grubu 5235, yetişkin grubu ise 5235 kişidir. Çalışmayı Ocak 2012 ile Nisan 2022 tarihleri arasında üçüncü basamak olan hastanemizde doğum yapan olgularla yaptık. Çalışmanın her aşamasında Helsinki Deklarasyonuna uyduk. Çalışmada grupların demografik verilerini, gebelik, doğum ve doğum sonrası dönemdeki anne ve fetal sonuçları karşılaştırdık. Grup ortalamalarını karşılaştırmak için Tek Yönlü Varyans Analizi (ANOVA) gerçekleştirdik. Gruplar arasındaki risk oranlarını belirlemek için odds ratio hesaplamasını kullandık. Analizler için Windows 24.0 için SPSS (SPSS Inc., Chicago, IL, ABD) kullandık. Verileri ortalama, standart sapma ve oran olarak sunduk ve P değeri 0,05'ten küçük olduğunda istatistiksel olarak anlamlı kabul ettik.

Sonuçlar: Çalışmamızda ergen gebelerde EMR görülme riskinin erişkin gebelere göre yaklaşık iki kat arttığı görüldü (aOR=01.987, 95%CI=1.197-2454, p=0.001). IUGR sonuçlarını araştırdığımızda ergen gebelerde riskin yaklaşık iki kat arttığını tespit ettik (aOR=2,129, 95%CI=1,754-2,947, p<0,0001).

Sonuç: Çalışmadan, adölesan gebeliklerde gebeliğe bağlı bazı olumsuz olayların arttığı anlaşılmaktadır. Bu nedenle adölesan gebeliklerin önlenmesi mümkün olmasa da bu gebeliklerin takibinin rutinden daha sık ve dikkatli yapılması gerekmektedir.

Anahtar Kelimeler: Hamilelik, genç yetişkin, yetişkin, sonuçlar, adolesan

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INTRODUCTION

We can define adolescence as a process in which childhood is left behind and the transition to adulthood begins. A very different period begins in adolescence, biologically, psychologically, and socially, starting from childhood. The World Health Organization (WHO) defined the age range of adolescents as 10-19 years.[1] According to WHO reports, approximately 16 million people give birth in adolescence yearly.[2] Unfortunately, preeclampsia, intrauterine growth retardation (IUGR), and preterm birth rates are higher in deliveries under 19 than in all pregnancies.[3-5] The increase in preeclampsia, IUGR, and preterm birth rates we mentioned in adolescents cannot be fully supported in the literature. Some large-scale studies show that these adverse outcomes are not increased in adolescents.[6,7] There needs to be more straightforward information about whether these negative results are due to young maternal age and insufficient biological maturation or other reasons. Our study aims to shed light on this subject, which needs to be clarified in the literature.

MATERIAL AND METHOD

The study was carried out with the permission of İstanbul Kanuni Sultan Süleyman Training and Research Hospita Clinical Researches Ethics Committee (Date: 21.04.2022, Decision No: KAEK/2022.04.109). We complied with the Declaration of Helsinki at all stages of the study.

The character of our study is a retrospective case-control study. Between January 2012 and April 2022, we surveyed a tertiary center, İstanbul Kanuni Sultan Süleyman Training and Research Hospital, Istanbul, Turkey. Our clinic is a center that receives intensive applications for obstetrics and gynecology. We included 15705 individuals in our retrospective cohort study. In our study, the adolescent pregnant group was 5235 people, the young adult group was 5235, and the adult group was 5235. In the study, we compared the demographic data of the groups with the maternal and fetal outcomes of pregnancy, delivery, and postpartum.

We collected data about the cases in the study electronically and manually from patient files. In the study, the first group consisted of pregnant women under the age of 19, the second group consisted of pregnant women between the ages of 19-25, and the third case group consisted of pregnant women between the ages of 26-33. Those aged 34 and above who left our clinic without giving birth, those who did not want surgery and postpartum follow-up and left the hospital by refusing treatment, those who were hospitalized for legal reasons, and those who were referred to another hospital were excluded from the study. The parameters evaluated in the study; maternal age, number of pregnancies, number of births, number of miscarriages, maternal body mass index (BMI), tobacco and drug use, number of fetuses in the current pregnancy, mode of delivery, chronic diseases, diseases developing during and after pregnancy (preeclampsia, Gestational Hypertension, Gestational Diabetes mellitus), pregnancy or delivery-related complications, fetal weight, fetal complications at or after birth, intrauterine growth retardation (IUGR), stillbirth, preterm birth, APGAR scores, and umbilical cord blood PH values. We calculated the gestational age determinations according to the last menstrual dates of the cases. We verified with the first-trimester head rump length (CRL). While premature births occur before 37 weeks, deliveries after 41 weeks constitute delayed births. When diagnosing preeclampsia and gestational hypertension (GHT), blood pressure was measured twice, at least 4 hours apart, and other markers were taken into account in cases with systolic blood pressure of 140 mmHg and above and/or 90 mmHg and above.[8] When diagnosing the cases with GDM, a two-stage glucose test (50g and 100g) was applied in 24-28 weeks.

Statistical Analysis

We performed a One-Way Analysis of Variance (ANOVA) to compare group means. We used the odds ratio calculation to determine the risk ratios for pregnancy complications between groups. We used the mean and standard deviation of the results for comparisons. We used SPSS for Windows 24.0 (SPSS Inc., Chicago, IL, USA) for the analyses. We presented the data as mean, standard deviation, and ratio and considered it statistically significant when the P value was less than 0.05.

RESULTS

Demographic information among the cohorts in our study is shown in **Table 1**. The mean ages of the groups were 17.13±1.01, 22.43±1.49, and 30.27±1.54 years, respectively, and there was a statistically significant difference (p=0001). When the gravida ratios were examined, they were 1.12±0.42, 2.23±1.22, and 2.92±1.27, respectively, and all values were statistically significantly different from each other (p=0001). The mean parity values were 0.13±0.27, 0.97±0.32, and 1.43±0.95, respectively, and all values were statistically significantly different from each other (p=0001). The mean pregnancies resulting in miscarriage of the groups were 0.06±0.01, 0.12±0.05, and 0.21±0.07, respectively, and all values were statistically significantly different from each other (p=0001). The nulliparity rates in all groups were 4346 (83.02%), 1529 (29.21%), and 788 (15.05%), and all values were statistically significantly different from each other (p=0001). Smoking rates among the groups were 580 (11.08%), 528 (10.09%), and 537 (10.26%), respectively. Smoking rates of the adolescent pregnant group were statistically significantly different from the other two groups (p=0.009).

Cesarean section rates and indications among the groups are shown in **Table 2**. Cesarean section rates were 1257 (24.01%), 2276 (43.48%), and 2472 (47.22%), respectively. Each of these ratios was statistically significantly different (p<0.0001). Severe preeclampsia rates were 51 (4.06%), 70 (3.08%), and 80 (3.24%), respectively, and were statistically significantly different to the detriment of the first group (p=0.003). Fetal distress rates were 3644 (28.96%), 162 (7.12%), and 117 (4.74%), respectively. These rates were statistically significantly different from each other (p=0.023). The previous cesarean rates were 219 (17.42%), 1226 (53.87%), and 1536 (62.14%), respectively. These rates were

Table 1. Demographic characteristics.

	Group1 (adolescent) N: 5235	Group 2 (19-25 years old) N: 5235	Group 3 ((26-33 years old) N: 5235	P value
Age (year)	17.13±1.01[a,b]	22.43±1.49[c]	30,27±1.54	<0.0001*
Gravide	1.12±0.42[a,b]	2.23±1.22[c]	2.92±1.27	<0.0001*
Parite	0.13±0.27[a,b]	0.97±0.32[c]	1.43±0.95	<0.0001*
Abortion	0.06±0.01[a,b]	0.12±0.05[c]	0.21±0.07	<0.0001*
Nulliparity	4346 (83.02%)[a,b]	1529 (29.21%)[c]	788 (15.05%)	<0.0001*
Maternal weight (kg)	63.56±13.45	64.12±17.23	63.12±12.78	0.678
Smoking	580 (11.08%)[a,b]	528 (10.09%)	537 (10.26%)	0.009*
Drug	6 (0.11%)	8 (0.15%)	7 (0.13%)	0.876
Chronic disease	11 (0.21%)	14 (0.27%)	13 (0.25%)	0,679

One-Way Analysis of Variance (ANOVA), p<0.05 statistically significant, a the difference between group 1 and group 2, b the difference between group 1 and group 3, c the difference between group 2 and group 3

Table 2. Cesarian ratio and indications.

	Group1 (adolescent pregnancy) N: 5235	Group 2 (19-25 years old) N: 5235	Group 3 ((26-33 years old) N: 5235	P value
Vaginal delivery	3978 (75.99%)[a,b]	2959 (56.52%)[c]	2763 (52.78%)	<0.0001*
Cesarean section	1257 (24.01%)[a,b]	2276 (43.48%)[c]	2472 (47.22%)	
Indications of CS n (%)	1257 (100%)[a,b]	2276 (100%)[c]	2472 (100%)	<0.0001*
Severe preeclampsia	51 (4.06%)[a,b]	70 (3.08%)	80 (3.24%)	0.003*
Labor arrest	120 (9.55%)[a,b]	163 (7.16%)[c]	80 (3.24%)	0.001*
CPD (cephalo-pelvic discordance)	152 (12.09%)[a,b]	79 (3.47%)[c]	33 (1.33%)	0.005*
Fetal distress	364 (28.96%)[a,b]	162 (7.12%)[c]	117 (4.74%)	0.023*
Previous C/S	219 (17.42%)[a,b]	1226 (53.87%)[c]	1536 (62.14%)	0.0001*
Malpresentation	128 (10.18%)[a,b]	53 (2.33%)	55 (2.22%)	<0.0001*
Macrosomia	22 (1.75%)[a,b]	66 (2.90%)	70 (2.83%)	0.022*
Eclampsia	2 (0.16%)[a,b]	27 (1.19%)	32 (1.29%)	<0.0001*
Multiple gestations	103 (8.19%)[a,b]	340 (14.94%)	363 (14.68%)	<0.0001*
Placenta previa	14 (1.11%)[a,b]	34 (1.49%)	39 (1.58%)	0.001*
Placental abruption	26 (2.07 %)[a,b]	29 (1.27 %)	36 (1.46 %)	0.039*
Cord prolapse	14 (1.11%)	22 (0.97%)	27(1.09%)	0.223
Denial of vagynal delivery	42 (3.34%)[a,b]	5 (0.22%)	4 (0.16%)	0.0001*

One-Way Analysis of Variance (ANOVA), p<0.05 statistically significant, a the difference between group 1 and group 2, b the difference between group 1 and group 3, c the difference between group 2 and group 3

statistically significantly different from each other (p=0.0001).

Complication rates of the groups during pregnancy, delivery, and postpartum are shown in **Table 3**. Fetal complication rates were 52 (1.32%), 38 (0.73%), and 41 (0.78%), respectively, and were statistically significantly different in favor of the second and third groups (p=0.034). Maternal complication rates were 162 (3.09%), 241 (4.60%), and 279 (5.33%), respectively, and all values were statistically significantly different from each other (p=0.001).

Maternal results during and after pregnancy are shown in **Table 4**. GDM rates were 112 (2.14%), 157 (3.00%), and 164 (3.13%) in the order of the groups, and these rates were statistically significant in favor of the adolescent pregnant group (p=0.016). Preeclampsia rates were 174 (3.32%), 286 (5.46%), and 276 (5.37%), respectively, and these rates were statistically significant in favor of the first group (p=0.027). Eclampsia rates were 17 (0.32%), 32 (0.61%), and 34 (0.65%), respectively, and these rates were statistically significant in favor of the first group (p=0.009). The HELLP rates were 8 (0.15%), 25 (0.48%), and 21 (0.40%), respectively, and these rates were statistically significant in favor of the first group (p=0.034). The PROM rates were 162 (3.09%), 88 (1.68%), and 90 (1.72%), respectively, and these rates were statistically significant (p=0.021) to the detriment of the first group. Multiple gestations rates were 152 (2.90%), 416 (7.95%), and 407 (7.77%), respectively, and these rates were statistically significant to the detriment of the first group (p=0.005).

Fetal outcomes during and after pregnancy are seen in **Table 5**. The mean fetal weight values were 3027.39±673 g, 3225.39±479 g, and 3309.39±781 g, respectively, and there was a statistically significant difference between all mean values (p=0.44). The mean fetal delivery weeks were 37.37±2.76, 37.79±2.44, and 37.77±2.06 weeks, respectively, and there was a statistically significant difference in favor of the first and third groups (p=0.017). IUGR rates were 198 (3.78%), 84 (1.60%), and 88 (1.68%), respectively, and there was a statistically significant difference to the detriment of the first group (p=0.017). Premature birth rates were 601 (11.48%), 372 (7.11%), and 366 (6.99%), respectively, and there was a statistically significant difference to the detriment of the first group (p=0.0001). APGAR scores for the first-minute mean values were 7.69±2.11, 7.81±1.87, and 7.88±2.05, respectively, and there was a statistically significant difference to the detriment of the first group (p=0.007). APGAR scores for the fifth minute mean values were 8.12±1.78, 8.63±2.11, and

Table 3. Fetal and maternal complications at or after delivery.

	Group1 (adolescent pregnancy) N: 5235	Group 2 (19-25 years old) N: 5235	Group 3 (26-33 years old) N: 5235	P value
Fetal complications at or after birth (%) None	5166 (98.68%)[a,b]	5197 (99.27%)	5194 (99.22%)	0.034*
Meconium aspiration syndrome	42 (0.80%)[a,b]	21 (0.40%)	25 (0.48%)	0.002*
Asfixy	12 (0.23%)[a,b]	7 (0.13%)	6 (0.11%)	0.005*
Brachial plexus injury	4 (0.08%)[a,b]	2 (0.04%)	2 (0.04%)	0.023*
Long Bone fracture	0 (0.00%)[a,b]	1(0.02%)[c]	0 (0.00%)	0.044*
Fetal death	11 (0.21%)[a,b]	7 (0.13%)	8 (0.15%)	0.001*
Total	52 (1.32%)[a,b]	38 (0.73%)	41(0.78%)	0.044*
Maternal complications at or after birth None	5073 (96.91%)[a,b]	5020 (95.40%)[c]	4956 (94.67%)	0.022*
Sphincter injury	21 (0.40%)[a,b]	11 (0.21%)[c]	7 (0.13%)	0.033*
Blood transfusions for peri/postpartum hemorrhage	103 (1.97%)	99 (1.89%)	107 (2.04%)	0.459
Bladder injury	5 (0.10%)[a,b]	17 (0.32%)[c]	25 (0.48%)	0.027*
İleus	6 (0.11%)[a,b]	15 (0.29%)	19 (0.36%)	0.001*
Wound infections	22 (0.42%)[a,b]	69 (1.32%)[c]	88 (1.68%)	0.001*
Pulmonary emboly	1 (0.02%)[a,b]	6 (0.11%)	7 (0.13%)	0.037*
Deep vein thrombosis	1 (0.02%)[a,b]	11 (0.21%)	10 (0.19%)	0.047*
Hematoma	3 (0.06%)[a,b]	7 (0.13%)	9 (0.17%)	0.002*
Relaparatomy for hemorrhage	0 (0.00%)[a,b]	6 (0.11%)	7 (0.13%)	0.0001*
Total	162 (3.09%)[a,b]	241 (4.60%)[c]	279 (5.33%)	0.001*

One-Way Analysis of Variance (ANOVA), p<0.05 statistically significant, a the difference between group 1 and group 2, b the difference between group 1 and group 3, c the difference between group 2 and group 3

Table 4. Maternal Outcomes during pregnancy and after delivery

	Group1 (adolescent pregnancy) N: 5235	Group 2 (19-25 years old) N: 5235	Group 3 (26-33 years old) N: 5235	P value
GDM	112 (2.14%)[a,b]	157(3.00%)	164 (3.13%)	0.016*
Gestational HT	15 (0.29%)	16 (0.31%)	17 (0.32%)	0.213
Preeclampsia	174 (3.32%)[a,b]	286 (5.46%)	276 (5.37%)	0.027*
Eclampsia	17 (0.32%)[a,b]	32 (0.61%)	34 (0.65%)	0.009*
HELLP	8 (0.15%)[a,b]	25 (0.48%)	21 (0.40%)	0.034*
PROM	162 (3.09%)[a,b]	88 (1.68%)	90 (1.72%)	0.021*
Multiple gestations	152(2.90%)[a,b]	416 (7.95%)	407 (7.77%)	0.005*

One-Way Analysis of Variance (ANOVA), p<0.05 statistically significant, a the difference between group 1 and group 2, b the difference between group 1 and group 3, c the difference between group 2 and group

Table 5. Fetal outcomes during and after delivery

	Group1 (adolescent pregnancy) N: 5235	Group 2 (19-25 years old) N: 5235	Group 3 ((26-33 years old) N: 5235	P value
Fetal weight (gram)	3027.39±673[a,b]	3225.39±479[c]	3309.39±781	0.044*
Gestational age of birth (weeks)	37.37±2.76[a,b]	37.79±2.44	37.77±2.06	0.017*
Growth retardation (IUGR)	198 (3.78%)[a,b]	84 (1.60%)	88 (1.68%)	0.0001*
Stillbirth	71 (1.36%)	79 (1.51%)	82 (1.57%)	0.131
Premature birth	601 (11.48%)[a,b]	372 (7.11%)	366 (6.99%)	0.0001*
Postmature birth	151 (2.88%)	134 (2.56%)	127 (2.43%)	0.067
APGAR scores the first minute	7.69±2.11[a,b]	7.81±1.87	7.88±2.05	0.007*
APGAR scores the fifth minute	8.12±1.78[a,b]	8.63±2.11	8.66±2.11	0.001*
APGAR scores the tenth minute	9.29±2.28	9.32±2.32	9.34±2.36	0.323
Umbilical cord blood PH values	7.42±0.45	7.44±0.54	7.43±0.48	0.212

One-Way Analysis of Variance (ANOVA), p<0.05 statistically significant, a the difference between group 1 and group 2, b the difference between group 1 and group 3, c the difference between group 2 and group 3

8.66±2.11, respectively, and there was a statistically significant difference to the detriment of the first group (p=0.001).

We see the crude and adjusted odds ratios of fetal and maternal results among the cohorts in **Table 6**. Our study observed that the risk of having PROM in adolescent pregnant women increased approximately two times compared to adult pregnant women (aOR=01.987, 95%CI=1.197-2454, p=0.001). When we look at the IUGR results, we found that the risk increased approximately two times in adolescent pregnant women (aOR=2.129, 95%CI=1.754-2.947, p<0.0001). As it can be understood from here, it is seen in Table VI that the risk of fetal weight, gestational age, preterm birth, APGAR first

Table 6. Crude and adjusted odds ratios of obstetric outcomes in adolescent pregnancies

	Crude OR (95%CI)	p-value	Adjusted OR (95%CI)	p-value
PROM[a]	2.112 (1.459-2.891)	<0.001	1.987 (1.197-2.454)	0.001
Fetal weights[b]	1.342 (1.232-1.456)	0.003	1.134 (1.104-1.232)	0.021
Gestational birth weeks	1.253 (1.123-1.456)	0.002	1.122 (1.021-1.219)	0.003
IUGR[b]	2.545 (1.965-3.465)	<0.000	2.129 (1.754-2947)	<0.0001
Preterm births[a]	1.532 (1.167-1.743)	<0.0001	1.265 (1.003-1.549)	0.001
APGAR first minute[c]	1.321 (1.274-1.421)	0.036	1.112 (1.109-1.302)	0.047
APGAR fifth minute[c]	1.119 (1.187-1.239)	0.022	1.097 (1.053-1157)	0.039

OR: Odds ratio; CI: Confidence Interval; IUGR: Intrauterine growth restriction; PROM: premature rupture of membranes; GDM: Gestational Diabetes Mellitus.
a Adjusted for smoking, age category (adolescent), IUGR, multiple gestation, and nulliparity.
b Adjusted for age category, macrosomia, IUGR, multiple gestation, and smoking.
c Adjusted for age category, multiple gestation, nulliparity, preeclampsia, IUGR, and preterm birth.

minute, and APGAR fifth minute values increase in adolescent pregnancy.

DISCUSSION

In our study, premature rupture of membranes, intrauterine growth retardation, and preterm delivery were higher in our adolescent pregnant cohort than in adult pregnant cohorts. Gestational age, first and fifth-minute APGAR values were lower in the adolescent cohort compared to the other groups. Fetal weight increased with increasing age in the groups. On the other hand, pregnant women younger than 19 years had lower rates of preeclampsia, gestational diabetes, HELLP, placenta previa, and multiple gestations.

Pregnancy under the age of 19 is a significant public health problem in all countries of the world. It has not been clarified whether pregnancies under 19 are associated with adverse obstetric outcomes such as preterm birth, pregnancy hypertensive diseases, gestational diabetes, low birth weight, multiple pregnancies, placental location anomalies, and intrauterine growth retardation. However, it is thought that among pregnant women under 19 and adults, these problems may be due to various factors such as different races, sociocultural and socioeconomic status, behavioral factors, biological immaturity, and inability to access health services.[9-11]

When we review the literature, while premature rupture of membranes does not differ between adolescents and adults in some studies, in parallel with our study, the risk of PROM doubles in adolescents in some studies.[12,13] The increase in PROMs in the adolescent pregnant group may be that these pregnant women are biologically immature—the immature uterus and cervix cause premature water flow and premature birth in pregnant adolescents.[14] Stevens-Simon et al. have shown immaturity-related shortening of the cervix length and increased cervical funneling in adolescents with decreasing age (15). Accordingly, an increase in the rate of PROM is likely in adolescent pregnant women. In our study, fetal weight was lower in the adolescent group compared to both adult groups. In the literature, regardless of whether adolescent pregnant women are in underdeveloped, developing, or developed countries, their babies' weight is lower than that of adult pregnant women.[16-22] Gestational age was also lower in the adolescent pregnant group compared to the adult cohorts. It is understood that this situation is associated with preterm birth and IUGR. Parallel to this situation, in our study, preterm birth and IUGR were also higher in the adolescent group than in the adult group. In this context, low gestational age, preterm birth, and IUGR rates parallel with some studies in the literature.[19-21,23,24] Demirci et al.[25] reported that the risk of IUGR is lower in pregnant women under the age of 19, while other studies show that the risk of IUGR is increased in young pregnancies.[21,26] In order to eliminate this contradiction, long-term, multi-center, forward-looking, multi-participant studies covering all segments of society are needed. We have associated obstetric problems such as increased preterm births, decreased fetal birth age, and decreased fetal birth weight with underdeveloped pelvic bones and muscles and immature cervix and uterus in adolescents.[14,15] In a study involving many centers (including African, South Asian, and Latin American countries), the risk of preterm labor is more than double under the age of 15.[11] In our study, in parallel with the literature, the risk of preterm birth in adolescent pregnant women increased with decreasing age of adolescents, and the risk of preterm labor in adolescents was 1.5 times compared to adults (Table VI). The first and fifth APGAR values between the groups were low to the detriment of adolescent pregnant women. Similar to our study, in the literature, there were studies with low first and fifth APGAR values to the detriment of the adolescent group. However, there were also studies where no significant difference could be found between the groups.[4,20,21,24,26] However, since obstetric problems such as PROM, low birth weight, low gestational age, and IUGR will impair fetal well-being, it is reasonable to have low APGAR values in the adolescent pregnant group.

Preeclampsia is a condition that negatively affects both the mother and the fetus. In the literature, some studies have shown an increased risk of preeclampsia in young pregnancies,[24,27] while others have reported a reduced risk of preeclampsia.[7,28] Leppälahti et al. found an increased preeclampsia and preterm delivery risk in the 13-15 age group.[29] In our cohort, the risk of preeclampsia was lower in the adolescent group and higher in the adult group. Among the adult groups, preeclampsia

was higher in the 25-33 age range than in the 19-24 age range. We could not find any information in the literature to explain or support this situation. However, we associated this situation with referring perinatological patients from many regions to our center, which accepts patients by reference. So, this rate may not reflect the average population. In order to eliminate this contradictory situation, long-term multi-center, prospective, multi-participant studies covering all parts of society are needed. Gestational DM is a condition that can have severe maternal and fetal consequences during pregnancy. In our study, low rates of GDM were found in the adolescent group, in line with the literature.[4,6,21,24] In our study, HELLP syndrome was found to be lower in the adolescent pregnant group, parallel to the study of Gomez et al.[22] Although the reason for this is not fully explained, we associated it with the high prevalence of hypertensive diseases of pregnancy in adult pregnant groups. In our study of placenta previa, we found low rates in the adolescent group, and there are conflicting results in the literature. In some studies, while it was low in the adolescent group, no difference was found in some groups.[13,21] We attributed this to the increase in placental location anomalies due to the high cesarean section rates and abortion in the adult group. Multiple pregnancies are also a condition that causes adverse maternal and fetal outcomes. In this context, the rate of multiple pregnancies in the adolescent pregnant group in our study was lower than in the adult group. This situation showed parallelism with other studies in the literature.[13,22] We think the low rate of multiple pregnancies in the adolescent pregnant group is due to assisted reproductive techniques in adult groups and the immature cervix and uterus of the adolescent pregnant group.

When the birth patterns of the cohorts were compared, we found statistically significant differences for each cohort. C/S ratios were relatively low in adolescents. At the same time, C/S ratios were lower in the young adult group compared to the adult pregnant group. When the literature was examined for this purpose, many studies also showed decreased C/S ratios with decreasing age.[4,6,7,18,20,25] argue that the reason for this may be related to parity. As the parity increases, the increase in C/S indications, mainly due to previous C/S, draws attention. The results were close to the literature when we looked individually at the cesarean section indications.[13,23] While fetal distress is the leading cause of cesarean section in the adolescent study group, this situation is due to previous cesarean sections in adult study groups. We attributed the increase in C/S ratios due to fetal distress in pregnant adolescents to the increase in standard vaginal birth rates. Of course, standard vaginal delivery does not cause fetal distress, but the frequency of procedures such as augmentation, induction, and forceps/vacuum increases in the delivery of adolescent pregnant women, increasing the fetal distress rate. The reason for all this is that adolescents are immature, including the uterus, pelvic muscles, and bones.[14,15]

An increase in anal sphincter damage, one of the maternal complications, draws attention in the adolescent pregnant group. We attributed this to the increased need for augmentation, induction, and forceps/vacuum during the active period of labor due to immature pelvic muscles and bones and uterine immaturity. In the literature, sphincter injury was not different from the adult groups.[13] Our study found that fetal complications such as meconium aspiration syndrome, fetal asphyxia, brachial plexus injury, and fetal death rates increased in the adolescent group. The literature shows that tertiary complications and the need for intensive care, including neonatal resuscitation and fetal deaths, increase adolescent pregnancies.[4,19,20] We did not encounter any information in the literature on brachial plexus increase. However, we attributed this to the poor development of the pelvis, especially the bony pelvis.

CONCLUSION

Pregnancy is inherently unpredictable. We found an increase in IUGR, PROM, low birth weight, preterm birth, fetal asphyxia, meconium aspiration syndrome, brachial plexus injury, and fetal death, especially in adolescent pregnant women. What we need to understand here is that the detection and follow-up of adolescent pregnancies are crucial in order to minimize these situations, many of which are unpredictable. Adolescent pregnancies should be followed more carefully and more frequently than the follow-up of an adult healthy pregnant woman, and very experienced obstetricians should be involved in labor. Only such intensive visits and approaches will reduce such dire consequences. Of course, it is necessary to give importance to sociological studies and contraception to reduce adolescent pregnancies.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of İstanbul Kanuni Sultan Suleyman Training and Research Hospita Clinical Researches Ethics Committee (Date: 21.04.2022, Decision No: KAEK/2022.04.109).

Informed Consent: Written informed consent taken from the patients.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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