



Birth statistics of adolescent pregnancies; evaluation of maternal and fetal outcomes

Adölesan gebeliklerin doğum istatistikleri; maternal ve fetal sonuçlarının değerlendirilmesi

Elmin Eminov¹ 

Ayşe Eminov² 

¹ Duzce University, Faculty of Medicine, Department of Obstetrics and Gynecology, Duzce, Türkiye

² Ege University, School of Medicine, Department of Surgical Medical Sciences, Department of Obstetrics and Gynaecology, İzmir, Türkiye

ABSTRACT

Aim: This study aims to evaluate the maternal and fetal outcomes of adolescent pregnant women who gave birth in the Gynecology and Obstetrics Clinic of Ağrı Training and Research Hospital.

Materials and Methods: The study was conducted as a retrospective study. The automation system of Ağrı Training and Research Hospital was used to conduct the study, and the data of 1560 patients who gave birth between January 1, 2018, and December 31, 2022, were examined retrospectively. 263 patients were excluded from the study due to missing data. The patients were divided into two groups: early adolescence and late adolescence. 84 patients in the early adolescence group and 1213 patients in the late adolescence group were included.

Results: A statistical difference was detected between the groups regarding age, gravida, and parity ($p<0.05$). There was no statistically significant difference between the groups regarding birth weight, birth weeks, first and fifth-minute Apgar values, type of birth, and stillbirth or preterm birth rates. Nulliparity rates were significantly higher in the early adolescent group.

Conclusion: Adolescent pregnancies are high-risk pregnancies with increased risks of pregnancy complications, including maternal and infant death. Therefore, studies to reduce adolescent pregnancy rates are essential for all societies.

Keywords: Adolescent pregnancies, stillbirth, preterm labor.

ÖZ

Amaç: Bu çalışmanın amacı, Ağrı Eğitim ve Araştırma Hastanesi Kadın Hastalıkları ve Doğum Kliniğinde doğum yapan adölesan gebelerin maternal ve fetal sonuçlarını değerlendirmektir.

Gereç ve Yöntem: Çalışma retrospektif bir çalışma olarak yapıldı. Çalışmanın yapılması için Ağrı Eğitim ve Araştırma Hastanesi otomasyon sisteminden faydalanıldı ve 01 ocak 2018 ile 31 aralık 2022 tarihleri arasında doğum yapan 1560 hastanın verileri retrospektif olarak incelendi. Eksik veri nedeniyle 263 hasta çalışma dışı bırakıldı. Hastalar, erken adölesan ve geç adölesan dönem olmak üzere 2 gruba ayrıldı. Erken adölesan dönem grubunda 84, geç adölesan dönem grubuna 1213 hasta dahil edildi.

Bulgular: Gruplar arasında yaş, gravida ve parite açısından değerlendirildiğinde istatistiksel fark saptandı ($p<0.05$). Gruplar arasında doğum kiloları, doğum haftaları, birinci ve beşinci dakika Apgar değerleri, doğum türü, ölü doğum veya erken doğum oranları açısından istatistiksel anlamlı fark saptanmadı. Nulliparite oranları anlamlı derecede erken adölesan grubunda daha fazlaydı.

Corresponding author: Elmin Eminov
Duzce University, Faculty of Medicine, Department of Obstetrics
and Gynecology, Duzce, Türkiye
E-mail: elmineminov@duzce.edu.tr
Application date: 10.12.2023 Accepted: 24.01.2024

Sonuç: Adölesan gebelikler, anne ve bebek ölümü de dahil olmak üzere gebelik komplikasyonları risklerinin arttığı riskli gebeliklerdir. Bu yüzden, adölesan gebelik oranlarının azaltılması için yapılacak olan çalışmalar tüm toplumlar için zaruridir.

Anahtar Sözcükler: Adölesan gebelikler, ölü doğum, erken doğum.

INTRODUCTION

According to the World Health Organization (WHO) data, 21 million women worldwide are between the ages of 15-19 and 2.5 million women under 16 give birth every year. Adolescent pregnancies cause an increase in pregnancy-related complications such as endometritis and systemic infections in women compared to older age pregnancies, and these complications cause severe deaths in women in this age group (1).

Adolescence is the period between the ages of 10 and 19. This is the transition period from childhood to adulthood, with its characteristics (2). Adolescent pregnancies are defined as pregnancies occurring in women in this age period (2). Physiological and psychological changes that occur during this period may cause these women to be interested in sexuality, and these women who do not have sufficient information about sexuality face the risk of sexually transmitted diseases and pregnancy.

Although it varies by country, adolescent pregnancies constitute approximately 11% of all pregnancies (2). Adolescent pregnancies are also related to the development level of countries. According to WHO data, the adolescent pregnancy rate was 28.8% in Nicaragua in 2014, while this rate was 0.7% in Japan in the same year (3). In recent years, adolescent pregnancy rates have been reported to be close to 20% in African countries (4), and even up to 50% in sub-Saharan regions (5).

Studies have shown that 60% of adolescent pregnancies result in birth (6). There is a significant increase in both maternal and fetal complication rates in pregnancies in this age group. Examples of these include complications such as premature birth, low birth weight, and increased rates of newborns needing intensive care (7). In addition, data regarding the increase in preeclampsia rates in adolescent pregnancies vary between studies (8), (9). In the studies conducted, there are contradictions in the findings regarding the Apgar scores of the newborns of adolescent women (10), (11).

In our study, we aimed to evaluate adolescent pregnant women's maternal and fetal outcomes. As maternal outcomes, we evaluated maternal age, gestational age, cesarean and normal birth rates, cesarean section indications, and premature birth rates, and as fetal outcomes, we evaluated results such as live and stillbirth rates, birth weight, and first and fifth minute Apgar scores.

MATERIALS and METHODS

The study was carried out in Ağrı province, which has a low development level in the Eastern Anatolia region of Turkey. For the study, the data of patients who gave birth at the Ağrı Training and Research Hospital Gynecology and Obstetrics Clinic between January 1, 2018 and December 31, 2022 were examined retrospectively. To conduct the study, ethical approval was received from Ağrı İbrahim Çeçen University Scientific Research Ethics Committee with number 292, and permission was received from Ağrı Provincial Health Directorate with number 107.

At the beginning of the study, the data of 1560 adolescent patients who gave birth between the dates mentioned above were examined. 263 patients were not included in the study due to missing data. The study was conducted with data from 1297 patients. Hospital automation system was used to collect data.

The study was designed in two groups, early adolescence (<15 years) and late adolescence (15-19 years), in accordance with the WHO definition, and the data of the two groups were compared. Age, gravity, parity, number of abortions and week of birth were evaluated as demographic data. As fetal outcomes, gender, birth weight, and first- and fifth-minute Apgar scores were evaluated. As maternal outcomes, type of birth, cesarean section indications, live-stillbirth rates were evaluated. Pregnancies completed after 20 weeks were considered birth. Pregnancies completed before 20 weeks, pregnancies with chromosomal anomalies, and ectopic pregnancies were excluded from the

study. Pregnancies completed before the 37th week were considered preterm birth.

Spss 28.0 program was used to analyze the data. Categorical measurements are summarized as number percentages. Mean and standard deviation values were used in the descriptive statistics of the data. Shapiro Wilk test was used to determine whether the variables met the assumption of normal distribution. Independent samples t test was applied to find out which group caused the difference between continuous variables in terms of means between groups, and Chi-square test was applied to find out which group caused the difference between nominal variables. $P < 0.05$ was accepted for the results to be considered statistically significant.

RESULTS

Our study was conducted by examining the data of 1297 patients. 84 patients were included in the early adolescence (<15 years) group, and 1213 patients were included in the late adolescence (15-19 years) group.

When demographic data were examined, a statistically significant difference was found between the groups in terms of age, gravida and parity ($p < 0.05$) (Table-1). When the groups were compared according to the number of abortions, number of stillbirths and average week of birth, no statistically significant difference was detected ($p > 0.05$) (Table-1).

When we look at the fetal results, the groups were compared according to the first and, fifth minute Apgar values and the baby's birth weight, and no statistically significant difference was observed between the groups ($p > 0.05$) (Table-2). When the babies of patients in both groups were examined according to gender, no statistically significant difference was found between the

groups ($p > 0.05$) (Table-2). While 49 of the babies born in the early adolescence group were boys (58.3%) and 35 were girls (41.7%), this rate was 626 boys (51.6%) and 587 girls (48.4%) in the late adolescence group (Table-2).

When the groups were examined according to live and stillbirth rates within the scope of maternal results, it was seen that 84 patients in the early adolescence group had a live birth, while there was no patient with a stillbirth. In the late adolescence group, 1202 (99.1%) patients had a live birth, while 11 (0.9%) patients had a stillbirth, but this was not statistically significant ($p > 0.05$) (Table-3).

When the groups were compared according to birth types, no statistically significant difference was found between the groups ($p > 0.05$). While the number of normal births was 71 (84.5%) and the number of cesarean births was 13 (15.5%) in the early adolescence group, the number of normal births was 958 (79%) and the number of cesarean births was 255 (21%) in the late adolescence group (Table-3).

The groups were examined according to premature birth rates and no statistically significant difference was found between the groups ($p > 0.05$). While 13 patients (15.5%) in the early adolescence group had premature birth, 202 patients (16.7%) in the late adolescence group had premature birth (Table-3).

Additionally, when the nulliparity rates are evaluated between the groups, we see that the nulliparity rates are higher in the early adolescence group and this is statistically significant ($p < 0.05$) (Table-3). In addition, when we examined the indications for cesarean section, it was seen that there was no statistically significant difference between the groups ($p > 0.005$) (Table-3).

Table-1. Demographic data.

Demographic Data	Early Adolescence	Late Adolescence	T Value	P Value
	≤15 years old	16-19 years old		
	Average±SD	Average±SD		
Age	14.80 ± 0.460	18.10 ± 0.712	-42.469	0.000*
Gravida	1.10±0.334	1.21±0.481	-2.996	0.003*
Parity	0.04±0.187	0.14±0.372	-4.506	0.000*
Number of Abortions	0.06±0.238	0.07±0.281	-0.415	0.678*
Number of Stillbirths	0.00±0.000	0.00±0.041	-0.372	0.710*
Birth Week	38.10±2.290	38.02±2.202	0.283	0.777*

* Independent Samples T-test

Table-2. Fetal outcomes.

Fetal Outcomes		Early Adolescence ≤15 years old		Late Adolescence 16-19 years old		T Value	P Value
		Average±SD		Average±SD			
Apgar 1.minute		7.89±0.581		7.81±0.856		0.834	0.404*
Apgar 5.minute		8.90±0.670		8.85±0.893		0.527	0.598*
Birth weight		3008.99±552.42		2966.73±483.33		0.767	0.443*
		n	%	n	%		
Gender	Male	49	58.3	626	51.6	1,424	0.233**
	Girl	35	41.7	587	48.4		

* Independent Samples T-test

** Chi-Square analysis test

Table-3. Maternal outcomes.

Maternal Outcomes		Early Adolescence ≤15 years old		Late Adolescence 16-19 years old		TOTAL		x ²	P.
		n	%	n	%	n	%		
Birth	Live birth	84	100.0	1202	99.1	1286	99.2	0.768	0.381**
	Stillbirth	0	0.0	11th	0.9	11th	0.8		
Birth Type	Vaginal Birth	71	84.5	958	79.0	1029	79.3	1,474	0.225**
	Cesarean Birth	13	15.5	255	21.0	268	20.7		
Mature and Premature Birth Rates	37 weeks and above	71	84.5	1011	83.3	1082	83.4	0.079	0.779**
	36 weeks and below	13	15.5	202	16.7	215	16.6		
Nulliparity Rates	Nulliparous	81	96.4	1055	87.0	1136	87.6	6,458	0.011**
	Multiparous	3	3.6	158	13.0	161	12.4		
Indications for Caesarean Section	Brech Presentation	one	1.2	35	2.9	36	2.8	7,609	0.815**
	Previous Uterine Surgery	0	0.0	42	3.5	42	3.2		
	Fetal Distress	9	10.7	97	8.0	106	8.2		
	Other Presentation anomalies	0	0.0	11th	0.9	11th	0.8		
	CPD	0	0.0	5	0.4	5	0.4		
	Multiple pregnancies	0	0.0	11th	0.9	11th	0.8		
	IUGR	0	0.0	one	0.1	one	0.1		
	Hypertensive Diseases of Pregnancy	one	1.2	12	1.0	13	1.0		
	Placental Abruption	0	0.0	7	0.6	7	0.5		
	Non-Progressive Labor	2	2.4	28	2.3	30	2.3		
Macrosomic Fetus	0	0.0	4	0.3	4	0.3			
Cord Prolapse	0	0.0	2	0.2	2	0.2			

DISCUSSION

Adolescent pregnancy rates vary by country. When WHO data is examined, it will be seen that 11% of all pregnancies consist of pregnant adolescents (1). Additionally, adolescent pregnancies are also related to the development level of countries. For example, while the average adolescent pregnancy rate in African countries is 141/1000, this rate is 25/1000 in Europe (2). In our study, we examined 5-year birth data and found the adolescent pregnancy rate to be 9.41%. Considering the low development level of the province where the study was conducted, this rate is surprisingly close to WHO data. The main reason for this is that the age and birth data of women giving birth may be incompletely recorded in the hospital automation system.

Studies have reported that stillbirth rates are high in adolescent pregnant women (12). Lewis et al. In their study, they reported that the risk of stillbirth was higher in late-term adolescent pregnant women (aged 17-18) and that this situation may also be related to low socio-economic status (12). Again, Zhang et al. also found in their study that adolescent pregnancies were associated with a higher risk of stillbirth and neonatal death, and that the risk was even higher, especially in young adolescents (10-17 years old) (13). However, Karataşlı et al. In their study, they found that adolescent pregnancies were not associated with stillbirth (14). In our study, we investigated the relationship between early and late-term adolescent pregnancies and stillbirth. While there was no stillbirth in the early-term adolescent pregnancy group, we found that 11 patients had stillbirth in the late-term adolescent pregnancy group, but this was not statistically significant.

Studies in the literature show that 5th minute Apgar values vary according to maternal age. Vieira et al. They reported that Apgar values in babies of adolescent pregnant women were lower than in babies of older pregnant women (10). Karataşlı et al. also obtained similar results in their study (14). Unlike other studies, we compared adolescent pregnant women in two groups, early and late term, and did not detect any statistical difference between the groups in terms of Apgar scores.

Agbor et al. In their study with Cameroonian adolescent pregnant women, they found that adolescent pregnancies were associated with low birth weight (SGA) (15). Zhang et al. They also obtained similar results in their study (13). In our study, unlike others, we compared adolescents in two groups, and when we considered the results of both groups, we did not find that adolescent pregnancies were associated with SGA.

In a study, it was reported that 3.4% of women became pregnant for the first time before the age of 15 and 39.5% had their first birth between the ages of 15-19 (16). According to the results of our study, 6.5% of adolescents gave birth before the age of 15, and 93.5% gave birth between the ages of 15-19. In addition, in our study, the groups were compared in terms of normal and cesarean birth rates and it was observed that there was no statistical difference between the groups. In another study, it was observed that the majority of adolescent pregnant women were nulliparous (17). In our study, similar to other studies in the literature, we found that the rates of nulliparous patients were higher in both groups.

When we examine cesarean section rates, we encounter very different results between countries. Özdemirci et al. In their study, they found that cesarean delivery rates were higher in adolescent pregnant women (18). In addition, Medhi and colleagues compared the cesarean delivery rates between adolescent pregnant women and older women in their study and found that there was no difference (9). Zhang et al., in their study, found that the cesarean section rates in adolescent pregnant women were lower than in adult pregnant women. They attributed this to the higher rates of premature birth and low birth weight babies in adolescent pregnant women compared to adults (13). In our study, we compared the cesarean section rates of pregnant adolescents among themselves and found that there was no statistical difference between the groups. Additionally, the groups were compared in terms of cesarean section indications and no statistical difference was found.

In the literature, many studies have been conducted on premature birth rates in adolescent pregnant women (7). In some of these studies, it was found that adolescent pregnant women were at a higher risk of premature birth compared to adult pregnant women (18). Karataşlı et al. In

their study, similar to other studies, they found that (14). Zhang et al. Similar to others, they found higher rates of preterm birth in adolescents (13). Contrary to all these results, Althabe et al., in their study on African-American adolescent pregnant women, found that premature birth rates were lower in adolescents than in adults, and they emphasized that the reason for this may be due to ethnic differences. Premature birth is defined as a multifactorial pregnancy complication. Factors such as the fact that adolescent women are not fully mature both anatomically, physiologically and psychologically, as well as low education and socio-economic levels, suggest that they may be associated with premature birth (7), (19). In our study, we compared early adolescence pregnancies with late adolescence pregnancies in terms of preterm birth and found that contrary to expectations, preterm births were not higher in the early adolescence period and the results were statistically similar.

The limitation of our study is that it was conducted retrospectively. Additionally, data from 263 patients were not included in the study due

to lack of hospital data. If these data had been included in the study, perhaps the results would have been different. In addition, since the hospital where the study was conducted was a tertiary hospital, it may have resulted in fewer negative outcomes due to the good prenatal care of adolescent pregnant women who applied to the hospital.

CONCLUSION

As a result, adolescent pregnancies are a common problem of countries and societies all over the world. Since adolescent women have not completed their maturation both anatomically and physiologically, the pregnancies of these women carry both maternal and fetal risks. Preventing adolescent pregnancies should be the common goal of all societies. For this, the most important thing to do is to increase the education levels of adolescents and integrate them into socio-economic life.

Conflict of interest: All authors participating in the study declare that there is no conflict of interest regarding the study.

References

1. World Health Organization. Adolescent Pregnancy. Fact Sheets 2018 12/2018. Available online: <https://www.who.int/news-room/fact-sheets/detail/adolescent-pregnancy> accessed on 14 December 2018).
2. Organization WH. Adolescent pregnancy. 2004.
3. Ganchimeg T, Ota E, Morisaki N, Laopaiboon M, Lumbiganon P, Zhang J, et al. Pregnancy and childbirth outcomes among adolescent mothers: a World Health Organization multicountry study. *BJOG: An International Journal of Obstetrics & Gynaecology*. 2014;121:40-8.
4. Kassa GM, Arowojolu A, Odugbo A, Yalew AW. Prevalence and determinants of adolescent pregnancy in Africa: a systematic review and meta-analysis. *Reproductive health*. 2018;15(1):1-17.
5. Sama C-B, Ngasa SN, Dzekem BS, Choukem S-P. Prevalence, predictors and adverse outcomes of adolescent pregnancy in sub-Saharan Africa: a protocol of a systematic review. *Systematic reviews*. 2017;6(1):1-6.
6. Kost K, Maddow-Zimet I. US teenage pregnancies, births and abortions, 2011: National trends by age, race and ethnicity. 2016.
7. Fraser AM, Brockert JE, Ward RH. Association of young maternal age with adverse reproductive outcomes. *New England journal of medicine*. 1995;332(17):1113-8.
8. de Vienne CM, Creveuil C, Dreyfus M. Does young maternal age increase the risk of adverse obstetric, fetal and neonatal outcomes: a cohort study. *European Journal of Obstetrics & Gynecology and Reproductive Biology*. 2009;147(2):151-6.
9. Medhi R, Das B, Das A, Ahmed M, Bawri S, Rai S. Adverse obstetrical and perinatal outcome in adolescent mothers associated with first birth: a hospital-based case-control study in a tertiary care hospital in North-East India. *Adolescent health, medicine and therapeutics*. 2016:37-42.
10. Vieira CL, Coeli CM, Pinheiro RS, Brandao ER, Camargo Jr K, Aguiar FP. Modifying effect of prenatal care on the association between young maternal age and adverse birth outcomes. *Journal of pediatric and adolescent gynecology*. 2012;25(3):185-9.

11. Torvie AJ, Callegari LS, Schiff MA, Debiec KE. Labor and delivery outcomes among young adolescents. *American journal of obstetrics and gynecology*. 2015;213(1):95. e1-. e8.
12. Lewis LN, Hickey M, Doherty DA, Skinner SR. How do pregnancy outcomes differ in teenage mothers? A Western Australian study. *Medical Journal of Australia*. 2009;190(10):537-41.
13. Zhang T, Wang H, Wang X, Yang Y, Zhang Y, Tang Z, et al. The adverse maternal and perinatal outcomes of adolescent pregnancy: a cross sectional study in Hebei, China. *BMC pregnancy and childbirth*. 2020;20(1):1-10.
14. Karataşlı V, Kanmaz AG, İnan AH, Budak A, Beyan E. Maternal and neonatal outcomes of adolescent pregnancy. *Journal of gynecology obstetrics and human reproduction*. 2019;48(5):347-50.
15. Agbor VN, Mbanga CM, Njim T. Adolescent deliveries in rural Cameroon: an 8-year trend, prevalence and adverse maternofetal outcomes. *Reproductive health*. 2017;14:1-8.
16. Smid M, Martins S, Whitaker AK, Gilliam M. Correlates of pregnancy before age 15 compared with pregnancy between the ages of 15 and 19 in the United States. *Obstetrics & Gynecology*. 2014;123(3):578-83.
17. Adashi EY, Gutman R. Delayed childbearing as a growing, previously unrecognized contributor to the national plural birth excess. *Obstetrics & Gynecology*. 2018;132(4):999-1006.
18. Ozdemirci S, Kasapoglu T, Cirik DA, Yerebasmaz N, Kayikcioglu F, Salgur F. Is late adolescence a real risk factor for an adverse outcome of pregnancy? *The Journal of Maternal-Fetal & Neonatal Medicine*. 2016;29(20):3391-4.
19. Brosens I, Muter J, Gargett CE, Puttemans P, Benagiano G, Brosens JJ. The impact of uterine immaturity on obstetrical syndromes during adolescence. *American Journal of Obstetrics and Gynecology*. 2017;217(5):546-55.