CLINICAL STUDY

Perinatal Outcomes of Adolescent Pregnancies at a University Hospital in Turkey

Gonca Ayşe **İMİR**[1], Meral **ÇETİN**[1], Özgül **BALTA**[1], Derya **BÜYÜKAYHAN**[2], Ali **ÇETİN**[1]

[1]*Department of Obstetrics and Gynecology, Faculty of Medicine, Cumhuriyet University, Sivas, Turkey*
[2]*Department of Pediatrics, Faculty of Medicine, Cumhuriyet University, Sivas, Turkey*

Received 11 May 2007; received in revised form 28 August 2007; accepted 03 September 2007; published online 21 November 2007

Abstract

Objective: Adolescent pregnancies have increased over the past years, being considered a significant social and reproductive concern and 15-20% of all births are to adolescent mothers. The purpose of this study was to compare the perinatal outcomes of women aged 19 or less with adult pregnancies between 20-38 years-old women in our institution.

Materials and Methods: The hospital admission charts of 715 adolescents (adolescent group) and 4560 adults aged 20-38 years (control group) delivered in a university hospital in Turkey were retrospectively studied. Maternal data including maternal age at delivery, gravidity, parity, gestational age at delivery, delivery mode, indications for cesarean section, and obstetric complications and also fetal outcome such as birth weight, Apgar scores, neonatal gender, neonatal morbidity and mortality were recorded.

Results: The median ages of the adolescent and the control group were 18 and 27 years, respectively. The ratios of low birth weight and macrosomia in adolescent and control groups were 26.4% vs. 22.9% and 2% vs. 5.6%, respectively. First minute Apgar score <7 in the newborns of the adolescent group was 23.9% compared to 20.7% in control group. The ratios of cesarean section delivery in adolescent and control groups were 30% and 52.7%, respectively. In adolescents the most common indications for cesarean section were acute fetal distress (31.3%), malpresentation (23.3%), and previous cesarean section (22.2%). The most common obstetric complications in adolescent pregnancies versus pregnancies in control group were premature rupture of membranes 49 (13.9% vs. 7.2%) ($p<0.05$), preterm delivery 39 (11.1% vs. 4.2%) ($p<0.05$), and eclampsia 18 (5% vs. 1.5%) ($p<0.05$).

Discussion: The prevalence of teenage pregnancies in Turkey remains high. Most teenage mothers and their newborn infants are vulnerable to a variety of potentially serious obstetric problems, and accordingly need appropriate help and support.

Keywords: adolescent pregnancies, obstetric complications, maternal outcomes, fetal complications

Özet

Türkiye'de Bir Üniversite Hastanesinde Adolesan Gebeliklerin Perinatal Sonuçları

Amaç: Son yıllarda adolesan gebelikler artmış ve önemli sosyal ve üreme ile ilgili bir konu halini almıştır. Yaklaşık tüm doğumların %15-20'si adolesan gebeliklerdir. Bu çalışmanın amacı, bizim enstitümüzdeki 19 yaşından küçük gebelerdeki perinatal sonuçların 20-38 yaş arası erişkin gebeliklerdekiler ile karşılaştırılmasıdır.

Materyal ve Metot: Bir üniversite hastanesinde doğum yapan 715 adolesan gebe (adolesan grup) ile 20-38 yaş arası 4560 erişkin gebenin (kontrol grubu) hastane dosyaları retrospektif olarak incelendi. Maternal yaş, gravidite, parite, gestasyonel yaş, doğum şekli, sezaryen endikasyonları ve obstetrik komplikasyonlar gibi maternal veriler ile yenidoğanla ilgili bebek doğum kilosu, 1. ve 5. dakika Apgar skorları, yenidoğan cinsiyeti ile morbidite ve mortalitesi kaydedildi.

Sonuçlar: Adolesan ve kontrol grubunun yaş ortalaması sırasıyla 18 ve 27 idi. Adolesan ve kontrol gruplarındaki düşük doğum ağırlıklı bebek oranı ile makrozomi oranı (%26.4 ve %22.9, sırasıyla) ve (%2 ve %5.6, sırasıyla) idi. Birinci dakika

Corresponding Author: Dr. Gonca Ayşe İmir
Cumhuriyet Üniversitesi Tıp Fakültesi,
Kadın Hastalıkları ve Doğum AD, 58140 Sivas, Türkiye
Phone : +90 346 258 05 98
Fax : +90 346 219 12 84
GSM : +90 537 920 92 40
E-mail : imirgonca@yahoo.com

Apgar skorunun <7 olması, adolesan gebelerin ve erişkin gebelerin yenidoğan bebeklerinde sırasıyla %23.9 ve %20.7 oranında idi. Adolesan gebelerdeki sezaryen doğum oranı %37, kontrol grubundaki ise %52.7 idi. Adolesan gebelerdeki en sık sezaryen doğum endikasyonu akut fetal distres (%31.3), malprezantasyon (%23.3) ve daha önce sezaryen doğum (%22.2) idi. Adolesan ve kontrol grubundaki en sık görülen komplikasyonlar, erken membran rüptürü (%13.9 ve %7.2) (p<0.05), preterm doğum (%11.1 ve %4.2) (p<0.05) ve eklampsi (%5 ve %1.5) (p<0.05) idi.
Tartışma: Türkiye'deki adolesan gebelikler hâlâ yüksek orandadır. Çoğu adolesan anne ve yenidoğan bebekleri potansiyel olarak çeşitli ciddi obstetrik problemlere yatkındır ve bunlara yönelik yardım ve desteğe ihtiyaçları vardır.

Anahtar sözcükler: adolesan gebelik, obstetrik komplikasyonlar, maternal sonuçlar, fetal komplikasyonlar

Introduction

Adolescent pregnancies have increased over the past years, being considered a significant social and reproductive concern (1). Particularly in developing countries, 15-20% of all births are in adolescent mothers (2). Adolescent mothers aged ≤19 years give birth to 17 million infants each year (2). Teenagers have greater exposure to poor nutrition and suboptimal prenatal care (3). In addition, socioeconomic and psychogenic factors such as race, economic status, emotional stress and insufficient education are also responsible for the poor outcome in adolescent pregnancies as well as abnormal uterine bleeding, a common gynecologic problem in adolescents (4-5). There are conflicting reports in the literature concerning maternal and perinatal outcome among adolescent pregnancies. In some previous reports, it has been noted that obstetric complications like low birth weight (LBW), preterm delivery, eclampsia, operative vaginal delivery, maternal and perinatal death occur more often in adolescent pregnancies (6-8). Contrary to those reports, the other investigators concluded that adolescent pregnancies have a favorable obstetric outcome and are not considered as high-risk pregnancies (9). Pavlova-Greenfield et al. (10), reviewed different age groups of adolescent pregnant women and reported low overall and similar complication rates among three studied age groups (13-15 years; 16-17 years; 18-19 years and controls). The main goal of the present study was to compare the adverse obstetric outcome of adolescent pregnancies aged 19 or less with adult pregnancies between 20-38 year-old women in our institution in Turkey.

Materials and Methods

After institutional review board approval of the medical faculty of our university which is located in central Anatolia in Turkey, this retrospective case control study was carried out in our institution. Women aged 19 or less, delivering at this facility during the 13 year period extending from June 1993 through August 2006 were considered eligible to be included in the adolescent group. In addition, data reviewed from a control group consisting of gravidas aged 20-38 who delivered during the study interval. Exclusion criteria were twin pregnancies and gestations before 20 weeks.

The following information pertaining to the mother was recorded for each case: maternal age at delivery, gravidity, parity, gestational age at delivery, delivery mode, indications for cesarean section, and obstetric complications. In addition, data were collected on fetal outcome including birth weight, Apgar scores, neonatal gender, neonatal morbidity and mortality.

Statistical analyses were performed with the software program SPSS software (Version 13, Chicago, IL, USA). Data were presented as mean ±SD or the median (min-max) and percentage. Continuous variables compared with the Student's t-test or Mann-Whitney U test, as appropriate. Categorical data were compared with the χ^2-test. A p value of <0.05 was considered as statistically significant.

Results

In total 715 adolescent pregnants, median (min-max) maternal age was 18 (14-19) of which 143 (20%) were ≤17 years, 217 (30.4%) were at 18 and 354 (49.5%) were at 19 years old. In 4560 cases in the control group, median (min-max) maternal age was 27 (20-38) of which 2869 (62.9%) were 20-29 years, and 1691 (37.1%) were 30-38 years old. The demographic characteristics and perinatal outcomes including maternal age, gravidity, parity, gestational age, neonatal gender, and 1. and 5. minute Apgar scores in both groups were recorded (Table 1). In the adolescent group, the median maternal age was 9 years younger than that of the control group.

Table 1. Demographic characteristics and obstetric outcomes in the adolescent and control groups

	Adolescent group (n=715)	Control group (n=4560)
Maternal age (years) [median (min-max)]	18 (14-19)*	27 (20-38)
Gravidity [median (min-max)]	1 (1-5)	2 (1-14)
Parity [median (min-max)]	1 (1-3)	2 (1-10)
Nulliparity (%)	86.2*	36.2
Multiparity (%)	13.8*	54.6
Grand multiparity (%)	0	9.2
Gestational age (weeks) (mean ±SD)	37.4±3.8	37.7±4.1
Gender of the newborn (female) n (%)	327 (45.8)	2198 (48.2)
1. minute Apgar score (mean ±SD)	7.8±2.2	7.9±2.5
5. minute Apgar score (mean ±SD)	9.1±2.1	9.2±2.6

*p<0.05 vs. control group.

Table 2. Birthweight and Apgar scores in 1. and 5. minutes of newborns in the adolescent and control groups

	Adolescent group (n=715) (%)	Control group (n=4560) (%)
<1000 g	9 (1.3)*	146 (3.2)
1001-1500 g	29 (4)	169 (3.7)
1501-2500 g	151 (21.1)*	729 (16)
2501-3000 g	193 (27)*	962 (21.1)
3001-4000 g	317 (44.4)*	2302 (50.5)
>4000 g	14 (2)*	255 (5.6)
Apgar score in 1. minute		
≤4	74 (10.4)	437 (9.6)
5-7	97 (13.5)	506 (11.1)
≥8	544 (76.1)	3616 (79.3)
Apgar score in 5. minute		
≤4	36 (5.1)	255 (5.6)
5-7	41 (5.7)	205 (4.5)
≥8	640 (89.6)	4094 (89.8)

*p<0.05 vs. control group.

Table 2 presents the distribution of birth weight and 1. and 5. minute Apgar scores of the newborns in the adolescent and control groups. Most of the newborns had normal birth weight (ranges of 3001-4000 g) in the adolescent (44.4%) and control (50.5%) groups (p<0.05). The ratio of LBW in the adolescent group was significantly higher than that of the control group (26.4% vs. 22.9%) (p<0.05). However, the ratios of very LBW (5.3% vs. 6.9%, respectively) were not significantly different in both groups. The ratio of macrosomia was lower in the adolescent group than that of the control group (2% vs. 5.6%) (p<0.05). First minute Apgar score ≤7 was significantly more frequent in the newborns of the adolescent group than that of the control group (23.9% vs. 20.7%) (p<0.05). Fifth minute Apgar score ≤7, however, was not significantly different in the newborns of the adolescent group and control group (10.8% vs. 10.1%). The ratio of cesarean delivery in the adolescent group was significantly lower than that of the control group (37% vs. 52.7%). The ratio of the operative delivery with vacuum extraction was 0.4% in the control group while there was no operative delivery in the adolescent group .

Table 3 depicts the indications for cesarean section in both groups. Regardless of the previous cesarean section, the ratio of fetal distress as indication for cesarean section, was significantly higher in adolescent group than that of the control group. In the adolescent group, malpresentation, the second major indication for cesarean section, was also significantly higher than that of the control group (p<0.05). Table 4 presents the ratio of the obstetric complications in the adolescent and control groups. The ratio of complicated pregnancies in the adolescent group was significantly higher than that of the control group (49.4% vs. 37.9%) (p<0.05).

Table 3. Indications for cesarean section in the adolescent and control groups

	Adolescent group (n=265) (%)	Control group (n=2403) (%)
Fetal distress	83 (31.3)*	481 (20)
Previous cesarean section	59 (22.2)*	1040 (43.3)
Breech presentation in the primigravida	40 (15.2)*	190 (7.9)
Transverse-oblique presentation	21 (8.1)*	74 (3.1)
Severe preeclampsia	16 (6.1)	106 (4.4)
Cephalopelvic disproportion	11 (4)	168 (7)
Abruptio placenta	11 (4)	62 (2.6)
Placenta acreata	5 (2)	5 (0.2)
Other indications	16 (6.1)	231 (9.6)

*p<0.05 vs. control group. Percentages are the ratios of the cases delivered with cesarean section in all cases in both groups.

The ratios of premature rupture of membranes (PROM), preterm labor, and eclampsia in the adolescent group were significantly higher than those of the control group. Maternal diabetes mellitus and thyroid disease only complicated the pregnancies in the control group.

Discussion

In this study, we compared the adverse obstetric outcomes of adolescent pregnancies aged 19 or less with adult pregnancies aged 20-38 years in our institution retrospectively. We found that adolescent mothers were at increased risk of PROM, preterm labor, eclampsia, fetal distress and LBW. We also observed that adolescent pregnancy in our province was associated with lower risks of maternal diabetes and thyroid diseases, cesarean delivery, operative vaginal delivery, macrosomia, and fetal death compared with adult pregnancy. Compared with older

Table 4. Obstetric complications in the adolescent and control groups

	Adolescent group (n=353) (%)	Control group (n=1728) (%)
PROM	49 (13.9)*	124 (7.2)
Preterm labor	39 (11.1)*	73 (4.2)
Preeclampsia	37 (10.6)	204 (11.8)
Eclampsia	18 (5)*	26 (1.5)
Intrauterine growth retardation	14 (3.9)	79 (4.6)
Stillbirth	8 (2.4)	57 (3.3)
Placental abnormalities	8 (2.3)	33 (1.9)
HELLP syndrome	6 (1.7)	28 (1.6)
Maternal heart disease	2 (0.6)	17 (1)
Maternal diabetes mellitus	0	17 (1)
Maternal thyroid disease	0	5 (0.3)

*p<0.05 vs. control group.
PROM: premature rupture of membranes.

women, adolescents were not at increased risk of preeclampsia, HELLP (hemolysis, elevated liver enzymes, and low platelet count) syndrome, maternal heart diseases, abruptio placenta, placenta previa, cephalopelvic disproportion, intrauterine growth retardation, and very LBW in their pregnancies.

Adolescent pregnancies are considered a high risk for both the mother and the fetus. Several studies declared the incidence of adolescent pregnancy ranging from 3.2% to 42% of the general population (11-13). The incidence of adolescent pregnancy in our study was 6.1%. The slight differences in the rate of adolescent pregnancy observed in different reports might be due to racial and regional differences. In our country, because of the social factors as national traditions and Islam religion, sex generally begins with marriage and the age of marriage is relatively low. Therefore, those results are different from the cited literature (11).

Satin and colleagues (9) analyzed pregnancy outcomes in over 16 500 nulliparous women and found that preterm birth was increased significantly among pregnancies at 11-16 years old compared with older mothers. In the literature, pregnancy in women less than 18 years old was associated with increased risk of preterm labor before 32 weeks' gestation (14). In another study the ratio of preterm birth was 18% in the adolescent pregnancies compared to 10% in the controls (15). In a Turkish study, the incidence of premature delivery (9.3% vs. 0.6%) was significantly higher among adolescents (6). Consistent with recently published report (16), we observed the higher frequency of preterm labor in the adolescent pregnancies.

Most reports of birth to teenagers indicate an increased risk of developing some complications of pregnancy and poor neonatal outcome, especially preeclampsia (17). We found that there is an increased risk in adolescent pregnancies for eclampsia consistent with the findings of Ingec et al. (16) and Hidalgo et al. (18); however, preeclampsia and HELLP syndrome were not high in adolescents in our study. Contrary to our finding, the incidence of pregnancy-induced hypertension overall (9.9% vs. 4%) was significantly higher in another Turkish study (6). In the study by Jahromi et al. (15), preeclampsia was not seen in the adolescent group but was diagnosed in 2% of mothers in control group.

There is a good evidence regarding the pregnancy outcome risks to which adolescents are exposed, particularly to LBW and very LBW (4,9,19,20), intrauterine growth restriction (21), premature birth (22) and perinatal mortality (19). In the present study, the incidence of LBW was higher in the adolescent mothers compared with the adults. In another Turkish study, Ayhan et al. (11) reported a lower rate of 9.5% for LBW. With regard to adverse perinatal outcomes, it is documented that a higher risk of LBW, very LBW, preterm delivery, very preterm delivery, and small for gestational age (SGA) among infants of adolescent mothers, with the youngest age groups running the highest risks (7). Contrary to our findings, Miller and colleagues (23) reported that very LBW infants were increased almost twofold in women less than 18 years old, compared with the general obstetrical population.

Previous investigations of perinatal mortality in adolescent pregnancy have yielded conflicting results. A previous study have found increased risk of neonatal mortality among infants born to adolescent mothers, (21) whereas another study found no increase (24). The rate of stillbirth (2.4%) in adolescents in our study which was slightly lower than that of the adult pregnancies was similar with those of previous studies (6,8).

In accordance with a previous study (14), we found no gestational diabetes in adolescents; concluding that screening for gestational diabetes of pregnant adolescents might be recommended only in the high risk group. Our study showed a rate of 0.6% for maternal heart disease and there were no patients with maternal thyroid disease in adolescent pregnancies.

Some previous studies reported that in the adolescent group cesarean delivery rate was lower compared to control group (9,10,15,24,25). It is reported in a Turkish study that in a community hospital cesarean delivery rate in adolescents was significantly lower (17.1% vs. 28.8%) (26). In accordance with those studies, our findings showed that adolescent mothers are at decreased risk of cesarean delivery (37% vs. 52.7%). Even that relative low rate of cesarean section in adolescents may seen high, however, our clinic is a tertiary referral university hospital clinic and most of our patients have high-risk pregnancies and poor socioeconomic condition such as low income, insufficient education and inadequate prenatal care. Most of the patients are not referred to our hospital unless there is an obstetric problem existed. But compared to the older patients, teenagers still show a lower cesarean section rate.

Lubrarsky et al. 1994 (25), demonstrated no increased risk of either prolonged labor or operative delivery contrary to the results of the previous studies suggested the fetopelvic disproportion as a consequence of incomplete development of the bony pelvis in adolescence (20). An earlier study (27) was also reported the lower rate of operative delivery in adolescence pregnancies. Operative vaginal delivery, elective cesarean, or emergency cesarean were all less likely in women aged less than 18 years (14). Consistent with those studies, we observed no operative delivery in adolescent mothers.

We observed that the most common causes of cesarean section, acute fetal distress, and malpresentation, were more

frequent in adolescent pregnancies except previous cesarean delivery was the major cause in the adult women.

Our study concluded that the prevalence of teenage pregnancies in Turkey remains high. Most teenage mothers and their newborn infants are vulnerable to a variety of potentially serious obstetric problems, and accordingly need appropriate help and support by counseling the adolescent women. Further investigations and studies should be conducted both in rural, secondary and tertiary care centers.

References

1. Chedraui P, Van Ardenne R, Wendte JF et al. Knowledge and practice of family planning and HIV-prevention behaviour among just delivered adolescents in Ecuador: the problem of adolescent pregnancies. Arch Gynecol Obstet 2007 Feb 15; [Epub ahead of print].
2. World Health Organization. The World Health Report 1998. Life in the 21st century: a vision for all. Geneva: WHO; 1998. p. 97.
3. Chandra PC, Schiavello HJ, Ravi B et al. Pregnancy outcomes in urban teenagers. Int J Gynaecol Obstet 2002;79:117-22.
4. DuPlessis HM, Bell R, Richards T. Adolescent pregnancy: understanding the impact of age and race on outcomes. J Adolesc Health 1997;20:187-97.
5. Tanrıverdi HA, Özbey B, Dilbaz S. Abnormal uterine bleeding in adolescents: a report of 31 cases. J Turkish German Gynecol Assoc 2002;3:59-62.
6. Bozkaya H, Mocan H, Usluca H et al. A retrospective analysis of adolescent pregnancies. Gynecol Obstet Invest 1996;42:146-50.
7. Conde-Agudelo A, Belizan JM, Lammers C. Maternal-perinatal morbidity and mortality associated with adolescent pregnancy in Latin America: Cross-sectional study. Am J Obstet Gynecol 2005;192:342-9.
8. Demir SC, Kadayifci O, Ozgunen T et al. Pregnancy outcomes in young Turkish women. J Pediatr Adolesc Gynecol 2000;13:177-81.
9. Satin AJ, Leveno KJ, Sherman ML et al. Maternal youth and pregnancy outcomes: middle school versus high school age groups compared with women beyond the teen years. Am J Obstet Gynecol 1994;171:184-7.
10. Pavlova-Greenfield T, Sutija VG, Gudavalli M. Adolescent pregnancy: positive perinatal outcome at a community hospital. J Perinat Med 2000;28:443-6.
11. Ayhan A, Yuce K, Kisnisci HA. Analysis of 20291 deliveries in a Turkish institution. Int J Gynaecol Obstet 1989;29:131-4.
12. Pal A, Gupta KB, Randhawa I. Adolescent pregnancy: a high risk group. J Indian Med Assoc 1997;95:127-8.
13. Perry RL, Mannino B, Hediger ML et al. Pregnacy in early adolescence: are there obstetric risks? J Matern Fetal Med 1996;5:333-9.
14. Jolly MC, Sebire N, Harris J et al. Obstetric risks of pregnancy in women less than 18 years old. Obstet Gynecol 2000;96:962-6.
15. Namavar Jahromi B, Daneshvar A. Pregnancy outcome of parturients below 16 years of age. Saudi Med J 2005;26:1417-9.
16. Ingec M, Borekci B, Yilmaz M et al. Impact of Maternal Age on Perinatal Outcomes in Adolescent Pregnancies. J Turkish German Gynecol Assoc 2005;6:290-5.
17. Suebnukarn K, Phupong V. Pregnancy outcomes in adolescents ≤15 years old. J Med Assoc Thai 2005;88:1758-62.
18. Hidalgo LA, Chedraui PA, Chavez MJ. Obstetrical and neonatal outcome in young adolescents of low socio-economic status: a case control study. Arch Gynecol Obstet 2005;271:207-11.
19. Berne L, Huberman B. Setting the stage: adolescent sexual health indicators in the United States, the Netherlands, Germany and France: European approaches to adolescent sexual behavior and responsibility. In: Alford S (ed). Advocates of Youth, Washington, DC; 1999. p. 1-9.
20. Zabin S, Kiragu K. The health consequences of adolescent sexual and fertility behaviour in sub-Saharian Africa. Stud Fam Plann 1998;29:210-32.
21. Miller FC. Impact of adolescent pregnancy as we approach the new millennium. J Pediatr Adolesc Gynecol 2000;13:5-8.
22. Forman SF, Aruda MM, Emans SJ et al. Followup of pregnant teens at a hospital based clinic. J Adolesc Health 1995;17:193-7.
23. Miller HS, Lesser KB, Reed KL. Adolescence and very low birth weight infants: a disproportionate association. Obstet Gynecol 1996;87:83-8.
24. Smith GCS, Pell JP. Teenage pregnancy and risk of adverse perinatal outcomes associated with first and second births: population based retrospective cohort study. BMJ 2001;323:476-9.
25. Lubarsky SL, Schiff E, Friedman SA et al. Obstetric characteristics among nulliparas under age 15. Obstet Gynecol 1994;84:365-8.
26. Zeteroglu S, Sahin I, Gol K. Cesarean delivery rates in adolescent pregnancy. Eur J Contracept Reprod Health Care 2005;10:119-22.
27. Brown HL, Fan YD, Gonsoulin WJ. Obstetric complications in young teenagers. South Med J 1991;84:46-8.