

Adverse perinatal outcomes of adolescent pregnancies in one center in Istanbul, Turkey

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Summary

Purpose: The objective of this study was to evaluate fetal and perinatal outcomes of pregnancies of adolescents and compare them with adult pregnancies. **Materials and Methods:** This retrospective case-control study was carried out at Bakirkoy Maternity and Children's Diseases Education and Research Hospital in Istanbul, Turkey. It enrolled 2,491 pregnancies who delivered between 2005-2010, of which 998 were adolescent pregnancies and 1,493 were adults as controls. **Results:** The mean age of the adolescent group was 17.10 years and in the control group the mean age was found to be 26.73 years. Inter-marriage, vaginal delivery, preterm rupture of membranes, preterm birth, and preeclampsia were significantly higher in adolescent pregnancies than the control group. Gestational diabetes was more common with increasing age. There was no statistically meaningful difference between the groups in terms of intrauterine growth restriction (IUGR), low birth weight, anemia, 5-minute APGAR score, and intrauterine fetal demise. **Conclusions:** Young maternal age is a risk factor for preterm birth, preterm rupture of membranes, and preeclampsia. According to this study, adolescent pregnancies are more risky and more likely to have adverse fetal outcomes.

Key words: Perinatal outcome; Adolescent pregnancies; Maternal age.

Introduction

In many countries, adolescent pregnancy and its results are one of the crucial public health problems with major social implications. In 2008, 16 million infants were born from mothers aged between 15-19 years. About 95% of these births were in the countries with low socio-economic level [1] and 11% of all the births were given by adolescent mothers. According to the latest estimates, even if there are relatively few births under the age of 16 years, every year, one million girls between the ages of 12 to 15 years are giving birth [2].

Adolescent pregnancies are associated with adverse pregnancy outcomes such as low birth weight, preterm birth, and perinatal and maternal mortality [3-5]. In addition, it is reported that there is an increased rate of pregnancy-induced hypertension, anemia, low weight gain during pregnancy, preterm birth, low birth weight infant, and perinatal mortality [6, 7]. Prenatal malnutrition, emotional stress, and suboptimal maintenance are more often among adolescents. Maternal lifestyle disadvantages and biological immaturity can introduce many problems for both intrauterine fetus and newborn during postnatal life [1]. The aim of the present study was to research, as adolescent pregnancies are compared with adult pregnancies, if there is more complications with the adolescents and what type of complications often occur.

Materials and Methods

The pregnant women who gave birth under the age of 18 years in Istanbul Bakirkoy Maternity and Child Diseases Education and Research Hospital between years 2005 to 2010 were studied retrospectively. The authors began running this study after approval from ethical board of Istanbul Bakirkoy Maternity and Child Diseases Education and Research Hospital (dated June 12, 2009 and 239 numbered ethical committee approval). The study included 2,628 maternal birth files that were retrieved from the hospital archive. The cases excluded were 126 that were over the actual age of 18 years and 11 cases with twin pregnancies. In addition, pregnancies that were less than 22 weeks and under 500 grams of fetal weight were not taken into account.

A number of 998 adolescents were included in the study. The control group was selected by random sampling method and 1,493 files of mothers between the ages 20-35 years who gave birth in the present hospital were studied retrospectively. A total of 2,491 files were studied throughout the trial. The age distribution of adolescent pregnancies is shown in Table 1. The records were reviewed by the same observer in terms of demographic and clinical results. With regards to the mother, maternal age, parity, gravidity, intermarriage, parity, gestational age, birth type, cesarean indications, complete blood count and hematocrit values, and obstetric complications were noted.

In addition, fetal results were assessed in terms of live births, stillbirths, birth weight, APGAR score, and requirement of neonatal intensive care unit. Obstetric complications as anemia, preeclampsia, eclampsia, HELLP syndrome, premature birth, premature rupture of membranes, intrauterine growth restriction (IUGR), and gestational diabetes were screened.

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Table 1. — The age distribution of adolescent pregnancies.

| Age | Number of patients | % |
|-------|--------------------|-------|
| 13 | 2 | 0.20 |
| 15 | 35 | 3.50 |
| 16 | 191 | 19.13 |
| 17 | 369 | 36.97 |
| 18 | 392 | 39.27 |
| Total | 998 | 100.0 |

Table 2. — The demographic characteristics of the groups.

| Variables | ≤ 18 age (n=998) | 20-35 age (n=1493) | p value |
|-------------------|------------------|--------------------|---------|
| Average age | 17.10 | 26.73 | |
| Intermarriage | 6% | 18% | <0.001 |
| Gravidity | 1.16±0.44 | 2.26±1.38 | <0.05 |
| Parity | 0.08±0.29 | 0.96±1.10 | <0.05 |
| Abortion | 0.07±0.30 | 0.23±0.52 | <0.05 |
| Week of birth | 38.3 | 38.4 | NS |
| Cesarean delivery | 31.6% | 38.6% | <0.001 |
| Birth weight | 3087.18 | 3134.61 | NS |

NS: Not significant

All the statistical calculations were performed with the Statistical Package for Social Sciences (SPSS version 15.0) statistical software package.

Results

The demographic characteristics of both the control and adolescent groups are shown in Table 2. It was calculated that the average age of the adolescent group was 17.10 years and in the control group it was 26.73 years; 188 of the adolescent pregnancies were intermarriage. There was a statistically significant difference compared to the control group. The adolescent group was significantly less in number of gravidity, parity, and abortion (Table 2). The number of parity of six adolescents were two and in 69 of them, it was one. The average gestational age was 38.3 weeks in the adolescent group and 38.4 weeks in the control group. There was no significant difference in terms of gestational age. The rate of vaginal delivery was 79.8% for the adolescent group and 61.4% for the control group. The type of birth was statistically different between the groups (Table 2). There was a statistical differences when the nulliparous patients of the groups were compared in terms of birth type.

In the present study, it is found that the reasons why adolescents undergo cesarean delivery were as follows: cephalopelvic disproportion (CPD), breech presentation, and fetal distress; however in the control group, CPD was the second reason after previous cesareans. As the previous cesareans were excluded, primary cesarean rate was 19.6% in the adolescent group and 23.4% in the control group. This difference was statistically meaningful ($p =$

Table 3. — Comparison of obstetric complications and neonatal results.

| Obstetric complications and neonatal results | ≤ 18 age (adolescent) | 20-35 age (control) | p value |
|--|-----------------------|---------------------|---------|
| PPROM | 54 (5.41 %) | 35 (2.34 %) | <0.001 |
| Preterm delivery (<37 weeks) | 95 (9.51 %) | 75 (5.02 %) | <0.001 |
| Preeclampsia | 47 (4.70 %) | 44 (2.94 %) | <0.05 |
| HELLP | 1 (0.10 %) | 3 (0.20 %) | NS |
| IUGR | 39 (3.90 %) | 52 (3.48 %) | NS |
| Intrauterine demise | 8 (0.80 %) | 23 (1.54 %) | NS |
| Gestational diabetes | 9 (0.90 %) | 68 (4.55 %) | <0.001 |
| Placental disorders | 10 (1.00 %) | 9 (0.60 %) | NS |
| 5-minute APGAR < 7 | 18 (1.80 %) | 17 (1.13 %) | NS |
| Small for gestational age (< 2,500gr) | 135 (13.52 %) | 160 (10.71 %) | NS |

NS: Not significant.

0.033). The incidence of premature rupture of membranes (PROM) in the adolescent group was 5.4% and in the control group it was 2.3%, and this was a statistically significant outcome. Ninety-five of the patients in the adolescent age group had premature delivery but in the control group the number of patients with premature delivery was only 75. The young age was found to be a risk factor for premature delivery; 4.7% of the adolescent patients developed preeclampsia, but in the control group the ratio of preeclampsia was 2.9%. The incidence of preeclampsia between these two groups was statistically significant. When the nulliparous patients in both groups were compared in terms of preeclampsia, there was no statistical difference. For preeclampsia, the nulliparity was found to be a more important risk factor than the age. In the adolescent group, six preeclamptic patients had an eclamptic seizure. No eclampsia case was seen in the control group. This difference was statistically significant ($p < 0.001$).

There was no significant difference in terms of IUGR and HELLP syndrome incidence. There were 68 patients with gestational diabetes in the control group and only nine in the adolescent group. This statistically significant difference supports the outcome that the incidence of gestational diabetes increases with the advancing age. There was no statistical difference with respect to placental disorders.

The ratio of low birth weight babies (< 2,500 grams) was 13.5% in the adolescent group and 10.7% in the control group. Babies with low birth weight were more in the adolescent group, but no significant differences were found. The average of 1st minute and 5th minute APGAR scores of live births in the adolescent group were 7.22 and 9.16 and in the control group were 6.93 and 8.94, respectively; 1.8% (n=18) of the babies by adolescent mothers had a 5-minute APGAR < 7 and this ratio was found to be 1.13% (n:17) in the control group members. Between the groups, there was no significant difference with regards to the neonatal outcomes.

Discussion

Adolescent pregnancy is a social problem in the countries at all levels including developed ones. However, the rate of childbearing in adolescent women varies depending on factors such as regional, cultural, religious, political, economic, and many others. Based on the results of Turkey Demographic and Health Survey in 2008, in Turkey 12.1% of women under the age of 18 give birth [8, 9]. In the present study, the average age calculated was 17.1 years in the adolescent group and the consanguinity rate was 18.8%. According to the results of 2008 survey, it is clear that the consanguinity rate was determined as 34.9% amongst the adolescent pregnancies in Turkey [9]. This difference occurs because the patients enrolled in the study are living in urban areas rather than rural ones.

Adolescent pregnancy is often considered as a high-risk pregnancy. The main reason responsible for the increased risk is not known but immaturity of the mother, low level of education, and low socio-economic status may be factors contributing to this situation. In the present study, there was no difference in terms of gestational week during delivery between adolescent and control groups. Preterm birth rate in the adolescent group was statistically and significantly higher (Table 3). In many other studies in the literature on adolescent pregnancies, the preterm birth rate was found to be higher depending on sociodemographic properties [4, 10, 11]. Similarly, in some studies there was no difference between the mean gestational age values, but preterm delivery rates were higher [12]. In addition, in another study similar to the present hospital-based study, preterm birth rate in adolescent age was found to be 27.7% and an increased risk of preterm birth amongst adolescents, when compared to the control group, was reported [13, 14]. In another study conducted in Turkey likewise showed an increased risk of preterm delivery [13, 15].

Recently, studies in Turkey and Cameroon, adolescent pregnancies had not been shown as a risk factor for PROM [5, 16]. In the present study, the frequency of PROM in the adolescent age group was found to be increased (2.3% to 5.4%). In the literature, being adolescent has been reported as a risk factor for PROM [14]. The contradicting results in the literature may be due to the variety of factors that influence PROM or the studies were generally arranged on referral hospitals in home countries.

In a study conducted on 403 patients, there was no difference in terms of preeclampsia among adolescents compared with the control group [17]. Similarly, in other studies conducted in Iran and in Turkey, preeclampsia did not show a higher incidence in adolescent group compared with the control group [5, 18]; 4.7% of the present patients in adolescent group ($n = 47$) developed preeclampsia. In the control group the ratio was 2.9% ($n = 44$). The incidence of preeclampsia between these two groups was statistically significant.

Many studies support the present research in terms of preeclampsia [15, 19]. However, studies conducted in France showed that as the maternal age decreased, the number of cases with preeclampsia decreased [20]. A large-scale cohort study conducted in Canada showed in adolescent pregnancies that the hypertensive problems are less common [14]. In the present study, comparing the nulliparous patients in the control and adolescent groups, there was a statistically significant difference in the incidence of preeclampsia. The different outcomes with the studies may be caused by the study design and the fact that these studies did not assess the entire community.

Between the two groups, no significant difference was observed in terms of HELLP syndrome and IUGR. Similarly, in another study in Turkey, there was no increased risk in terms of HELLP syndrome and IUGR for adolescents; on the other hand, as being adolescent was shown to be a risk factor for eclampsia [21]. In contrast, Turkey and Iran conducted studies that showed an increased risk for IUGR [18, 22]. In utero mort fetalis (IUMF) was seen in 1.54% of the patients in the reproductive age group ($n=23$) and in 0.80% of adolescents ($n=8$); this difference was not statistically significant. In the present study, similar results were found [21, 23]. In a study by Mukhopadhyay *et al.*, stillbirth occurred in 5.1% of the patients and this result was significantly higher than the control group. Adolescent pregnancies are considered as a risk factor for stillbirth [13]. Although 4.55% of the patients in the reproductive age group had gestational diabetes ($n=68$), in the adolescent group the ratio was 0.90% ($n=9$) ($p < 0.001$). As other large-scale studies indicate, the incidence of gestational diabetes increases with the increase in age: similar to the present study [14]. Ihab *et al.* showed in their study that gestational diabetes was at a similar rate in both groups, however in Turkey, Karabulut *et al.* in adolescent group and in the older age group showed that gestational diabetes was observed more often than in the control group [15, 23].

Unlike many studies in the literature, the present authors observed no increase in the incidence of anemia for adolescent pregnancies when compared with the control group [5, 20]. In a study on pregnant women by Karaoglu *et al.*, anemia rate was 27.1%, and 24.3% in both groups, respectively and they found no differences between the two groups [24]. In addition, adolescent pregnancies frequently result as a risk factor for low birth weight and very low birth weight [4, 5, 11, 12, 19, 25]. In many studies conducted in last year, low birth weight risk increased with adolescents [5, 15, 26]. Khash *et al.* in their study examined nearly 50,000 pregnancies and did not show an increased risk for low birth weight in adolescents [27]. As a matter of fact, it has been a topic of debate whether adolescent mothers are at higher risk of these complications or not. Among adolescents who have easy access to health services are reported to be generally at less risk of complications [28]. Harville *et al.* reported in their study that preterm birth and low weight birth was distributed

equally among adolescent and young adult mothers [29]. In the present study there were no significant differences in terms of having low birth weight babies. In terms of having 5-minute APGAR score below 7 and other neonatal outcomes, there was no significant difference between the two groups. In the literature there are studies showing similar results [23]. Another study conducted in Turkey showed that there were no significant differences between the two groups [21]; another study, though difficult to explain, reported higher 5-minute APGAR scores in adult women [5]. In studies from Canada and conducted in Turkey the infants of adolescent mothers had lower 5 minute APGAR scores [12, 26]. Differences in the results of studies may depend on receiving inadequate antenatal follow-up and different socio-demographic characteristics of the study groups.

Mahavark *et al.* did not report a difference between the type of delivery in adolescents and control group [19]. However, strongly parallel to literature, the present study showed that the adolescent age group had a higher rate of normal birth than the control group [5, 9, 11, 14, 15, 20]. In this study, the cesarean rate was 21.1% for the adolescent group and 31.6% for the control group. Similarly, in a study by Bildircin *et al.*, the rate of cesarean section were found to be 17.1% and 28.8% for the adolescent and control groups, respectively. Higher cesarean birth rates in older age groups may be attributed to several cesarean reasons previously performed. In the present clinic, vaginal birth after caesarean is not common, patients with sections routinely undergo surgery. In parallel to other studies CPD was found to be the most common indication for caesarean section in the adolescent group [11, 30]. Teenage pregnancies in Western countries are unwanted pregnancies by those living with a very irregular life. Considering the conditions of the present country, adolescent pregnancies are more common both in rural places as well as in urban migrations that have subsequently broken socioeconomic status. Large proportion of these pregnant women are married and have a settled life. Drug, alcohol, and smoking habits are virtually nonexistent. Most of these young couples are influenced by family elders, although these young parents are unwilling to accept].

Conclusion

In the present study as the authors compared adolescent pregnancies with normal reproductive age pregnancies in terms of obstetric and fetal outcomes, adolescent pregnancies were identified as a risk factor for preterm delivery, PROM, preeclampsia, and eclampsia. It would not be reasonable to compare the teenage pregnancies in Western society with pregnancies in the present country to expect similar results. Because when only the adolescent age group is viewed, according to the data of Turkey Demographic and Health Survey in 2008, out of wedlock pregnancies remained below 1%; this ratio was 79.4% in USA

for adolescents. Sixteen adolescent mothers in the present study, were removed from their families due to pregnancy and were housed in social service agencies. In the general population, sexual intercourse without marriage among young people is increasingly acceptable. Therefore, future problems with teenage pregnancies can vary and may be similar to developed countries. In adolescence, pregnancies within marriage are caused by lack of education and unemployed parents; on the other hand, pregnancies without marriage are caused by ignorance and not knowing the risks of pregnancy. In this regard, improving the girls' participation in education, making high school education mandatory, and encouraging women to take place in working life more often, will help increasing the status of women, as well as protect teens from early marriage and consequently from early pregnancies and various complications. To close the knowledge gap regarding safe sex life, the curriculum should be enriched with sexual health information and mass media education campaigns should be carried out in order to educate adolescents remaining out of school. Young people should have easy access to health units to receive counseling services without any judgement.

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