

Adolescent pregnancies: Maternal and fetal outcomes in a large sample size

Adolescent pregnancies with maternal and foetal outcomes

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Aim: Pregnancy of adolescents is associated with numerous complications both for mother and newborns. This study sought to examine adolescent pregnancy in comparison with adult pregnancies in terms of maternal and fetal outcomes in a large sample size of healthy women.

Material and Methods: This retrospective study included data on 1,331 adolescents who had deliveries at the Department of Obstetrics. Data included maternal age, parity, gestational age, APGAR scores, maternal blood levels of thyroid stimulating hormone (TSH), triiodothyronine (T3), thyroxine (T4), and hemoglobin at delivery, birth weight, birth height, head circumference, and admission to the neonatal intensive care unit (NICU).

Results: Of 14,184 participating mothers, 1331 were adolescent mothers, and 12853 were controls. Adolescent mothers significantly differed from the control group with respect to three main domains of study: maternal, laboratory, and newborn. Significant maternal characteristics were delivery week (38.4 ± 1.1 vs 39.7 ± 1.1 , $p=0.0001$), and higher incidences of preterm birth (7.0% vs 3.4%, $p=0.032$) and operative vaginal delivery (3.2% vs 2.6, $p=0.006$). Significant maternal laboratory findings were increased platelet count and increased TSH. Significant newborn characteristics were decreased weight ($3,114 \pm 424$ vs $3,245 \pm 439$, $p=0.0001$), height (50.0 ± 2.3 vs 50.4 ± 2.2 , $p=0.0001$), and head circumference (33.9 ± 1.4 vs 34.3 ± 1.3 , $p=0.0001$), but higher incidences of LBW and stillbirth.

Discussion: Adolescent pregnancy and delivery is actually a public health problem, causing physical and psychological problems particularly for mothers, postpartum problems for the newborns, for their families, and social problems for the whole society.

Keywords

Adolescent Mother, Complications, Newborn

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Introduction

Adolescent pregnancies include pregnancies of girls between the ages of 10 and 18. Actually, the majority of these pregnancies are not intentional and socially programmed. According to the World Health Organization (WHO), each year approximately 21 million girls aged 15 to 19 years get pregnant. The vast majority of adolescent pregnancies are seen in low- and middle-income countries [1, 2].

Adolescent pregnancy is often the result of a wide variety of social problems covering early marriage, substance abuse, sexual violence, lack of availability of contraceptives, lack of supportive services, insufficient maternal education, poverty, lack of parental support, religious beliefs, and adverse effects of social media and pornography [1-4].

Pregnancy of adolescents is associated with numerous complications both for mother and newborns. During pregnancy, adolescents are more likely to develop preeclampsia, preterm premature rupture of the membrane (PPROM), pregnancy-induced hypertension, anemia, postpartum depression, and even maternal death, as well as sexually transmitted diseases, and operative vaginal deliveries (forceps/vacuum). Adolescent pregnancy also places newborns at increased risks of low birth weight (LBW), prematurity, stillbirth, and small for gestational age [5, 6].

These pregnancies can be reduced by providing sex education, easy accessibility to contraceptives, the use of condoms, and reducing marriage before the age of 18.

Contrary to mature women, pregnancy in adolescence provides no extra advantage in biological, mental, or social development and maturation. In contrast, it impairs the normal development of adolescents, particularly during the early years [7].

This study sought to examine adolescent pregnancy in comparison with adult pregnancies in terms of maternal and fetal outcomes in a large sample size of healthy women.

Material and Methods

Study design and participants

This retrospective study included data on 1,331 adolescents (13-18 years) who had deliveries between June 1, 2014 and August 1, 2018 at the Department of Obstetrics of Esenler Maternity and Child Health State Hospital in Istanbul. A control group of 12,853 mothers aged >18-35 years, who underwent deliveries during the same period was also included.

Data on deliveries were retrieved from hospital and patient records, including maternal age, parity, gestational age, APGAR 1 and 5 min scores, maternal blood levels of thyroid stimulating hormone (TSH), triiodothyronine (T3), thyroxine (T4), and hemoglobin at delivery, birth weight, birth height, head circumference, and admission to the neonatal intensive care unit (NICU).

Inclusion criteria were healthy mothers with a singleton pregnancy for both groups. Those with the following conditions were excluded: multigestation, missing clinical or hospital data, diabetes mellitus, preeclampsia, and/or congenital fetal anomalies.

The study was approved by the Ethics and Research Committee of Sadi Konuk Training and Research Hospital (Permission No. 2023/337; date: 2023-10-02) and was performed in accordance

with the principles and guidelines of the Declaration of Helsinki [8]. Analysis and reporting of the results are in compliance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist.

Definitions

Maternal anemia and low birth weight (LBW) were defined according to the WHO criteria; that is, blood hemoglobin level less than 11 g/dL and birth weight less than 2,500 grams (g), respectively. Birth weight of more than 4,000 g was considered macrosomia [9-11].

Data processing and analysis

Data were collected using a structured format, including all relevant clinical information and were processed using the Statistical Package for Social Sciences (SPSS) version 28 (IBM Corp., Armonk, N.Y.; USA). Quantitative data were expressed as means with standard deviation (SD), median, minimum, and maximum, and qualitative data as frequencies and percentages.

Table 1. Comparison of adolescent mothers and 18-35 mothers with respect to maternal and fetal clinical characteristics

Parameters	Adolescent group (n=1331)	Control group (n=12853)	P
Age (years), mean±SD	17.1±1.0	28.8±4.5	NA
Nationality, n (%)			
Turkish (age >16)	19.7 (262)	62.7 (8054)	NA
Syrian (age>12)	80.2 (1067)	36.7 (4723)	NA
Other	0.1 (2)	0.6 (76)	NA
Maternal			
Parity mean±SD	1.69±.62	2.37±1.07	0.0001
Primiparity	519 (39.0)	2210 (17.2)	0.0001
Multiparity	812 (61.0)	10643 (82.8)	
At delivery weeks mean±SD	38.4±1.1	39.7±1.1	0.0001
Preterm n (%)	93 (7.0)	443 (3.4)	0.032
Term n(%)	1230 (92.4)	12356 (96.1)	
Posterm n(%)	8 (0.6)	54 (0.4)	
Operative vaginal deliveries (forceps/vacuum) n (%)	42 (3.2)	339 (2.6)	0.006
Uterine atony	32 (2.4)	334 (2.6)	0.624
Primary cesarean section n (%)	100 (19.3)	782 (35.4)	0.0001
Hemoglobin (g/dL), mean±SD	11.02±1.63	11.06±1.60	0.411
Platelet count (x 10 ³ /μL), mean±SD	226±65	214±61	0.0001
TSH (mIU/L), mean±SD	2.80±1.50	2.60±2.15	0.008
Free T4 (mIU/L), mean±SD	1.15±0.19	1.15±0.26	0.882
Free T3 (mIU/L), mean±SD	3.28±0.53	3.23±0.70	0.452
Anemia (<11 g/dL) n(%)	643 (48.3)	6143 (47.8)	0.720
Thrombocytopenia (<150.000 mIU/L)	137 (10.3)	1741 (13.5)	0.001
Newborn			
Weight (kg), mean±SD	3,114±424	3,245±439	0.0001
Height (cm), mean±SD	50.0±2.3	50.4±2.2	0.0001
Head circumference (cm), mean±SD	33.9±1.4	34.3±1.3	0.0001
LBW, n (%)	85 (6.4)	499 (3.9)	0.0001
Macrosomia, n (%)	12 (0.9)	499 (3.9)	
APGAR, mean±SD			
1 st . minute	8.9±0.7	8.9±0.6	0.095
5 th . minute	9.9±0.8	9.9±0.5	0.085
NICU admission, n (%)	12 (0.9)	74 (0.6)	0.145
Stillbirth, n (%)	6 (0.5)	22 (0.2)	0.029
NICU: The Neonatal Intensive Care Unit; NA: Not applicable			

Homogeneity was checked using Levene's test, with a p-value of >0.05 considered in favour of homogeneity. The Shapiro-Wilk normality test was used to check whether continuous variables were normally distributed.

For pairwise comparisons, numerical variables were compared using the independent t-test if normally distributed. Nominal variables were analyzed with Pearson's chi-squared test. A p-value of < 0.05 was accepted as statistically significant. All variables were expressed with 95% confidence intervals (CI).

Ethical Approval

Ethics Committee approval for the study was obtained.

Results

Socio-demographic, clinical and obstetrics characteristics of the study and control participants are presented in Table 1. The mean age was 17.1±1.0 years among adolescents and 28.8±4.5 in the control group. The corresponding figures for median parity were 2 in the adolescent group and 2 in the control group. Deliveries occurred at a mean gestational age of 38.4±1.1 weeks in the adolescent group and 39.7±1.1 in the control group (p=0.0001). The mean birth weight was 3,114±424 g in the study group and 3,245±439 g in the control group (p=0.0001).

Adolescent mothers significantly differed from the control group with respect to three main domains of study: maternal, laboratory, and newborn. Significant maternal characteristics were delivery week (38.4±1.1 vs 39.7±1.1, p=0.0001), and higher incidences of preterm birth (7.0% vs 3.4%, p=0.032) and operative vaginal delivery (3.2% vs 2.6, p=0.006). Significant maternal laboratory findings were increased platelet count (226±65 vs 214±61, p=0.0001) and increased TSH (2.80±1.50 vs 2.60±2.15, p=0.008). Significant newborn characteristics were decreased weight (3,114±424 vs 3,245±439, p=0.0001), height (50.0±2.3 vs 50.4±2.2, p=0.0001), and head circumference (33.9±1.4 vs 34.3±1.3, p=0.0001), but higher incidences of LBW (6.4% vs 3.9%, p=0.0001) and stillbirth (0.5% vs 0.2% vs p=0.029).

Discussion

In our study, we evaluated maternal and fetal outcomes of adolescent mothers in comparison with older mothers aged >18-35 years. In Turkey, the age for a woman to become pregnant is 18 years. However, in some circumstances, parental consent is required for woman aged 17 years. Ages 16-17 years are considered legally unacceptable and require a judge's approval. In this series, all Turkish individuals (n=262) were older than 16 years. Those who were younger than 16 years (n=117) were all Syrian refugees who were not covered by Turkish legislation.

As expected, the incidences of adverse delivery outcomes were significantly higher among adolescents, such as LBW and stillbirth, as well as physical characteristics of the newborns with smaller weight, height and head circumference. The findings were also at the expense of the adolescent mothers with earlier deliveries, higher incidences of preterm birth and operative vaginal delivery.

Similar findings were reported addressing the same problems associated with teenage mothers [6, 12-14]. Maheshwari et al. found significantly higher rates of premature birth and LBW [15].

Although the authors found a smaller 1-minute APGAR score in newborns to adolescent mothers, in our study, 1- and 5-minute APGAR scores were similar in adolescent and older mothers.

Adolescent pregnancy and delivery are actually a public health problem, causing physical and psychological problems particularly for mothers, postpartum problems for the newborns, for their families, and social problems for the whole society [14, 16, 17]. Significant efforts are needed to reduce the prevalence of adolescent pregnancy through sex education, increasing access to contraceptives and increasing awareness of adolescents and their families about the adverse consequences of adolescent pregnancy [18].

Limitations

Although our study includes a considerably large sample size of adolescent mothers, it is limited to gestational and postpartum findings and psychological and psychosocial consequences of adolescent pregnancy would have been very valuable to be examined.

Conclusion

Our study points to a relatively overlooked issue concerning adolescent pregnancy and adolescent mothers. Our finding that adolescent mothers accounted for 9.4% of pregnant mothers presenting for delivery to our obstetrics department should alert health authorities for urgent initiation of preventive actions, the most important of which is providing adolescents and their families with education.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and Human Rights Statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

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Conflict of Interest

The authors declare that there is no conflict of interest.

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