

Difference between Preterm Birth in Adolescent and Adult Patients

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ABSTRACT

Background: Preterm delivery represents an important public health problem due to its neonatal outcomes. There are numerous complications that occur due to prematurity, but the most significant one is represented by neonatal death. Even if the certain mechanism of prematurity is elusive, there are various risk factors known to be involved in the etiology of preterm birth, among which one is young age.

Objectives: The present study aims to find whether preterm delivery has a higher rate in adolescent patients and if neonatal outcomes are different in adolescent and adult patients.

Patients and methods: We performed an observational retrospective study about preterm infants from adolescent and adult patients. Thus, we analyzed 96 patients aged between 13 and 38 years who delivered in our unit between October 1st 2018 and December 31st 2021. Patients were divided into two groups: a study group (n=59), which included adolescents who delivered preterm, and a control group (n=37), which comprised adult patients who delivered preterm. We evaluated the rate of prematurity of all births and among patients enrolled in the present study and the neonatal outcome by newborn's weight, one-minute newborn's Apgar score and Neonatal Intensive Care Unit (NICU) admission.

Results: In our study, the rate of prematurity was higher in adolescent patients, with a rate of 61.46%. The newborns' outcomes, analyzed by newborn's weight and one-minute Apgar score, were better in adolescent patients compared to adult ones. Therefore, newborns from adult patients needed neonatal intensive care more often, with a rate of 62.16%, while in the study group the percentage was 38.98%. The rate of antenatal care was higher in adult patients compared to adolescent ones (32.43% versus 27.12%).

Conclusion: Adolescents have a higher risk of preterm delivery; however, their newborns have better outcomes than those of adult patients. The lack of antenatal care represents a risk factor for preterm delivery.

Keywords: preterm delivery, adolescent pregnancy, newborn's weight, one-minute Apgar score, Neonatal Intensive Care Unit.

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INTRODUCTION

Preterm delivery, defined as childbirth before 37 completed weeks of gestation, is the main cause of perinatal morbidity and mortality worldwide (1-4). The consequences of preterm delivery are represented by short- and long-term adverse outcomes (1-7). Complications may occur in the early newborn period (e.g., respiratory distress syndrome or necrotizing enterocolitis) but also in the long-term (e.g., bronchopulmonary dysplasia or retinopathy of prematurity) (8). Preterm infants who experience one or more of the above-mentioned complications have a high risk of neurological disabilities (8). More than that, all over the world, prematurity accounts for approximately 35% of all neonatal deaths (9, 10).

The incidence of preterm birth varies depending on the demographic characteristics. In Europe, Australia, Northern America, Asia and Africa, the rate of preterm deliveries ranges between 5% and 13% (1, 4, 11-14). Worldwide, prematurity is estimated to affect 11% of all live births. Given the high incidence of preterm delivery and its related complications, it is a significant public health problem (9).

There are various risk factors for preterm delivery, including history of preterm birth, inadequate prenatal care, anemia, substance abuse, premature rupture of membranes, vaginal infections, gestational hypertension, maternal age less than 20 years or over 35 years, multiple pregnancies, and ethnic characteristics or genetic attributes (1, 13-33). Despite the involvement of multiple risk factors, the etiology of preterm delivery has not been completely established yet (20, 26, 28). Because the underlying causes of preterm delivery may be due to biochemical mechanisms of labor interacting with multiplicity of medical and socio-economic factors, it is difficult to predict and prevent it (1).

As previously mentioned, one of those risk factors is represented by maternal age. Adolescent pregnancies are associated with a high risk of adverse neonatal complications, including preterm delivery. It is assumed that teenagers have a higher risk of pregnancy complications due to the biological immaturity; however, researches have recently shown that maternal and fetal complications were more likely to be associated to lack of

antenatal care, poverty and low socio-economic status (34-37).

The purpose of the present study is to compare the rate of preterm delivery among adolescent and adult patients and to analyze the neonatal outcomes of preterm newborns from these two groups. Also, we explored whether, despite preterm birth complications, maternal age may influence the neonatal outcome.

PATIENTS AND METHODS

We performed an observational retrospective study with the aim of evaluating the neonatal outcomes of preterm newborns from adolescent and adult patients who delivered in the Department of Obstetrics and Gynecology of Bucharest University Emergency Hospital. The study was carried out between October 1st 2018 – December 31st 2021 and included 96 patients. Subjects were divided into two groups: a study group, which comprised, 59 adolescent patients aged 13–19 years, and a control group that consisted of 37 adult patients aged 20–38 years.

Maternal age was recorded at the time of admission to hospital. Gestational age was recorded according to the last menstrual period, if known, or ultrasound report. Deliveries were recorded as expulsion of the fetus after 24 completed weeks of gestation or over 500 grams. Gestational products below 24 weeks of gestation or below

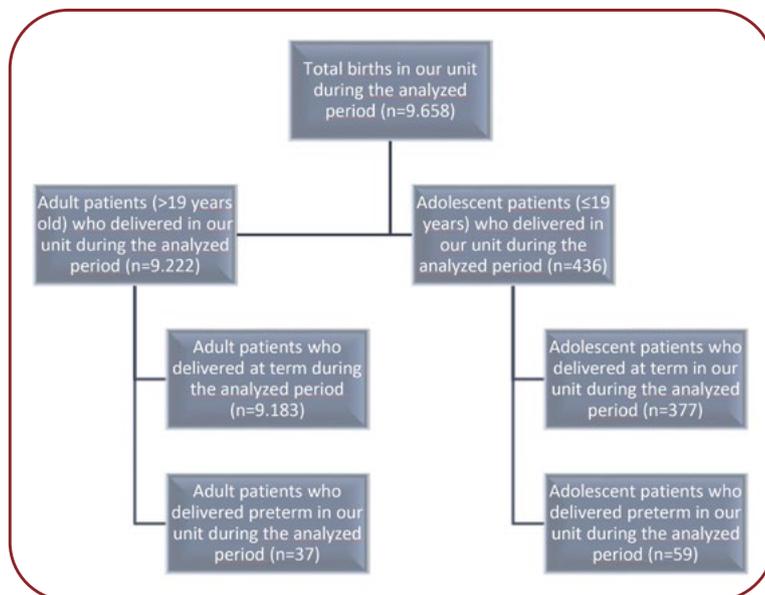


FIGURE 1. Selection and distribution of patients participating in the study

500 grams were considered abortions and were not included in the present study.

Preterm birth was defined as delivery before 37 completed weeks of gestation. The information regarding pregnancy and neonatal outcomes data were retrieved from the hospitalization sheets and the Base Data System of Bucharest University Emergency Hospital.

Inclusion criteria were represented by patients aged between 13 and 38 years who delivered preterm in our unit and provided an informed consent for participation in the present study which has been signed by either each of them or the legal tutor for patients aged under 16.

Exclusion criteria included refusal to participate in the study, presence of associated pathologies such as infection with hepatitis C virus, hepatitis B virus or immunodeficiency virus, and patients with multiple pregnancies.

Figure 1 illustrates the selection and distribution of patients participating in the study.

RESULTS

We explored 96 patients aged between 13 and 38 years who delivered preterm in our unit during the study period and observed that 4.51% of all births were registered among adolescents. Prematurity accounted for 0.99% of all births, with adolescent preterm deliveries representing 0.61%. The rate of prematurity was higher for teenage patients compared to adult ones (13.53% versus 0.40%) (Figure 2).

The cases were stratified by maternal age, area of residence BMI category, gestational age, status of antenatal care, birth weight, one-minute Apgar score and NICU admission (Table 1).

The rate of preterm births in our study was 61.46% among adolescents and 38.54% among adult patients (Figure 3).

We evaluated the neonatal status by the newborn’s weight, one-minute Apgar score, and NICU admission. Newborns’ weights were higher in the study group compared to the control group (Figure 4). Most of the patients in both groups delivered a newborn whose birth weight varied between 2,000 and 2,999 grams.

Most of the newborns from both the study and control groups had a one-minute Apgar score of 8 (Figure 5). On the other hand, there were two early neonatal deaths in the study group. It is of note that eight newborns in the study group, but

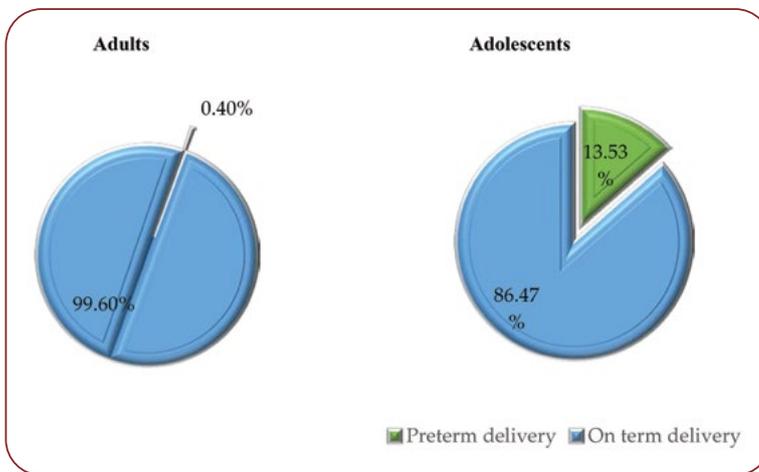


FIGURE 2. The rate of preterm birth in adolescent and adult patients in relation to all births

TABLE 1. Description of study participants and their characteristics

Demographic data	Adolescent group	Adult group
Maternal age, mean (SD)	15.96±1.60	29.05±4.38
Area of residence		
Urban (%)	57.63	75.68
Rural (%)	42.37	24.32
BMI category		
Normoponderal (%)	98.31	72.97
Obesity (%)	1.69	27.03
Obstetrical characteristics		
Primiparous (%)	88.14	75.68
Multiparous (%)	11.86	24.32
Prenatal care		
Yes (%)	27.12	32.43
No (%)	72.88	67.57
Mode of delivery		
Cesarean section (%)	35.60	35.14
Vaginal delivery (%)	64.40	64.86
Gestational age at delivery (weeks), mean (SD)		
	33.42±2.69	32.51±3.37
Neonatal outcomes		
Birth weight (grams), mean (SD)	2243.84±642.18	1930.54±620.91
one-minute Apgar score, mean (SD)	7.16±2.70	6.75±1.32
NICU admission, n (%)	38.98%	62.16%

*BMI=body mass index; NICU=Neonatal Intensive Care Unit

none in the control group, had an Apgar score of 10. The majority of newborns from the control

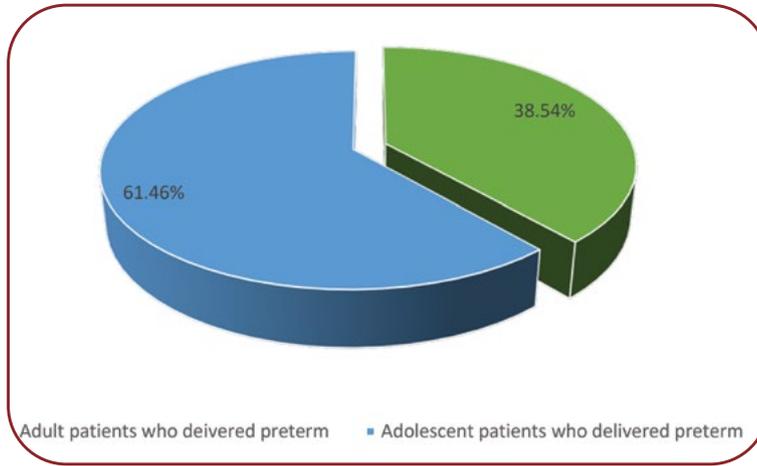


FIGURE 3. The rate of patients who delivered preterm in the study and control groups

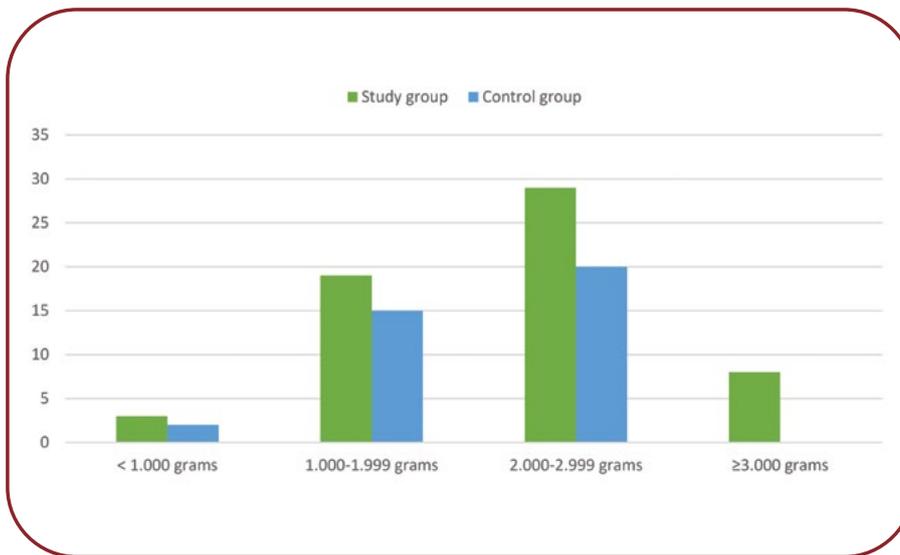


FIGURE 4. Newborns' distribution according to their weight in the study and control groups

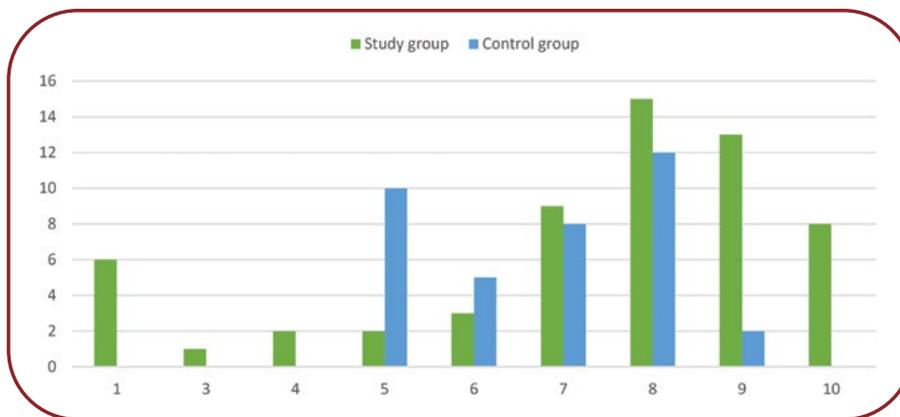


FIGURE 5. Newborns' distribution by their one-minute Apgar score in the study and control groups

group had a one-minute Apgar score of 8, while the second most common Apgar score was 5.

Regrading NICU admission, intensive care was needed by most of the adult patients' preterm newborns and by none of those born to adolescent patients (Figure 6).

DISCUSSIONS

Preterm births affect approximately 13 million infants, but its incidence depends on demographic characteristics (3). Thus, the rate varies between 12% and 13% in the US and between

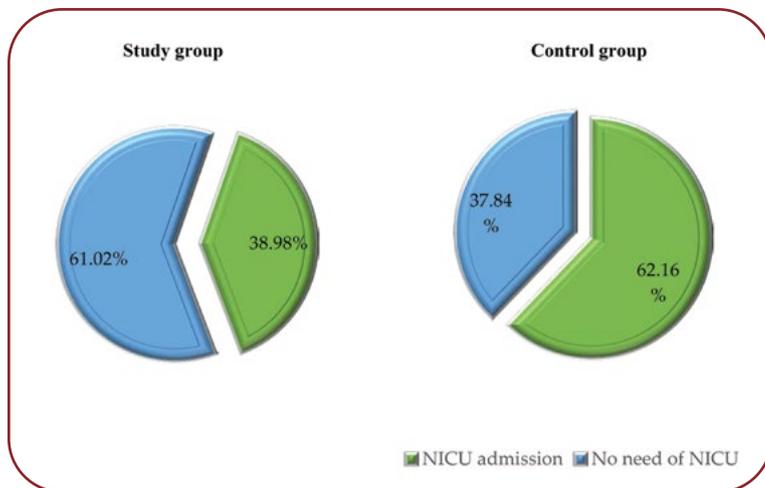


FIGURE 6. The rate of NICU admission of preterm newborns from the study and control groups

5% and 9% in Europe (4, 38, 39). It is known that young age represents a risk factor for preterm delivery and therefore, adolescents have a higher risk of preterm birth (34). A study on 1080 adolescents and 19807 adult subjects showed that the rate of preterm birth was 10.2% in adolescent patients and 8.9% in patients aged 20–34 years (36). A systemic review and meta-analysis regarding the neonatal outcomes from adolescents who were living in Canada has also found out that patients in this age group had a higher risk of preterm delivery than adult ones (34). Our study revealed that, among all births, a higher rate of young patients delivered preterm compared to adult ones. As well, the majority of patients enrolled in the present study were adolescents (61.46%). A possible explanation for the high rates of prematurity among adolescents may be the higher incidence of lack of antenatal care in adolescent patients (72.88%) compared to adult ones (67.57%).

Regarding the neonatal outcomes, we evaluated the newborns' weight, one-minute Apgar score and need for NICU. It is clear that prematurity affects the newborns' weight and Apgar score, but it is significant to find whether there is any difference between these in adolescents' newborns compared to adult patients' ones. We showed that preterm newborns from teenagers had better outcomes than those from adult patients. Therefore, the mean weight was 2.243 grams in the study group versus 1.930 grams in the control group. The mean one-minute Apgar score was 7.16 in newborns to adolescents and 6.75 in those to adult patients. Regarding the neonatal in-

tensive care, admission to NICU was required for most of the newborns to adult patients but for only 38.98% of those to patients included in the study group. These outcomes may be mainly due to the high incidence of no prenatal care in the study group, which explains why most adolescent patients did not know their last menstrual period. As well, studies show that adolescents have a higher risk of low weight birth compared to adults (34). Therefore, the gestational age evaluated by ultrasound exam may be misled among adolescent patients who had not undergone any prenatal visit and did not know their last menstrual period. This is also an acceptable explanation for the low rate of NICU admissions for the newborns to patients in the study group.

Limitation of the study

The present study has some limitations that should be taken into account for further research. The sample size is small, therefore large-scale studies should be performed in order to report more accurate results. More than that, the lack of prenatal care in both groups, especially in adolescent patients, may influence the outcomes, hence more patients with adequate prenatal care and the risk of preterm delivery should be evaluated. Moreover, the socio-economic status, an important parameter known to influence the neonatal outcomes mainly in adolescent patients (34), was not available in the database.

CONCLUSIONS

Preterm delivery is an important public health problem due to its both short- and long-term complications. The most significant and easy action that healthcare providers can take to prevent preterm birth is to implement new strategies to encourage prenatal care, particularly among teenage patients. Adolescent pregnancy involves a high risk of preterm delivery due to biological immaturity and, to a greater extent, due to lack of antenatal care. □

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Institutional Review Board Statement: The study was approved by the local Ethical

Committee of University Emergency Hospital Bucharest.

Informed consent: Informed consent was obtained from all patients involved in the study.

Data availability: The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

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