



## Features of Pregnancy, Childbirth and Postpartum Period of Young Mothers

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### ABSTRACT

According to the article, pregnancy in adolescence is associated with a high risk of developing adverse outcomes both during pregnancy and childbirth in the later period. The purpose of our study was to identify the features of pregnancy and childbirth, the postpartum period in young mothers. Materials and methods. A retrospective analysis of the birth history of 299 maternity hospitals was performed. The research material was archived data from the Regional perinatal center No. 3 in Turkestan (Kazakhstan). The main (1) group was formed by 199 maternity women under 19 years of age (2019). The control (2) group was formed by 100 maternity women aged 20 to 30 years, whose sexual life began after the age of 18. Results. The age of the surveyed women in group 1 ranges from 15 to 19 years, averaging ~16.9 years. 17-year-old girls predominated (66.7%). The average age of women in group 2 was ~25.8 years. Adolescent pregnancy is a risk factor for adverse child outcomes, such as premature birth, low birth weight, fetal growth retardation, neonatal and infant mortality. In the adolescent pregnancy and delivery group, preterm birth occurred in 35 cases, which accounted for 6.8% of the total preterm birth population for 2019, but in the adolescent birth group it was 17.5%. Of the 199 births in 2 were multiple births (1%), 197 live births, the percentage of live births among adolescents was 98%, respectively, the stillbirth rate was 2% (4 cases). Conclusion: the frequency of teenage pregnancy in the dynamics of years does not tend to decrease, among young mothers only every 6 received pre-pregnancy training, and every 5 was re-pregnant and among re-pregnant women under 19 years.

**Keywords:** adolescent pregnancy, features, childbirth, postpartum period

## INTRODUCTION

Juvenile pregnancy is a problematic phenomenon, this problem is not only medical, but also psychological and economic (2,5). The state has to spend money not only on medical care, but also on material and social support for young mothers, and it is unlikely that the majority of this category of parents will continue their education and work in the near future. Conception that occurs in a young woman leads to the development of an accidental (unplanned) pregnancy. The statistics are as follows: 70% of these pregnancies end in medical abortions (quite often in late term), 15% in spontaneous miscarriages, and only 15% in childbirth (4,10).

Adolescent pregnancy is associated with the development of not only medical, but also social problems. A large number of studies have shown that early pregnancy is associated with the development of chronic psychological stress. An extremely negative attitude towards young pregnant women on the part of medical professionals, relatives and society as a whole is

also important. The problem is also compounded by social and family insecurity. One of the characteristic features of teenage pregnancy at the present stage is its frequent development on the background of chronic infectious diseases of the genital organs, due to the increase in sexual activity in a modification of sexual behaviour (increase in number of sexual partners, non-traditional types of sexual activity, drug use). A direct consequence of this is an increase in the number of unwanted pregnancies among adolescents. According to literature data, among pregnant girls aged 15 to 19, the onset of pregnancy was unplanned in 82 % of cases. In a study conducted by H. S. Connery and B. B. Albright (2014), it was shown that an unwanted pregnancy is associated with a potentially high risk of exposure to various adverse factors (including Smoking, alcohol) on the health of the fetus, since about 58% of unplanned pregnancies are confirmed only after 5 weeks of gestation. The high prevalence of teenage pregnancy is observed not only in Russia, but also in Western Europe and the United States of America. In the United States, for example, in 2008, the rate of pregnancy among adolescents aged 15 to 19 was 68 per 1,000 (in 1998, the rate was 117 per 1,000). It is

important to note that, according to these statistics, from 64 to 76% of all cases are teenagers aged 18 to 19 years and only less than 40% of girls aged 15 to 18 years.

Pregnancy in adolescence is associated with a high risk of developing adverse outcomes both during pregnancy and childbirth, and in the later period. According to WHO, about 16 million births to girls between the ages of 15 and 19 are registered each year, and almost all of them occur in developing countries. Although adolescent pregnancy rates are declining globally, there is a significant difference in rates at the regional and national levels. Cases of early pregnancy occur more often among the least well-off and least educated adolescents. For some of these girls, pregnancy and the birth of a child is an expected and desired event, but not for all. There are several factors that cause this. Often girls do not get pregnant of their own volition, because they do not know how to protect themselves, or because they are forced to have sexual relations. Pregnant adolescents have more limited access to safe abortion services and qualified medical care during the prenatal period, during childbirth and after birth. It is believed that the main causes of these complications are biological and socio-economic factors.

The most common socio-economic risk factors are low level of education, insufficient prenatal care, and low social status. Biological immaturity also affects the risk of adverse pregnancy outcomes. Lack of proper prenatal care, insufficient weight gain, and Smoking during pregnancy are considered risk factors for adverse outcomes among newborns, including low birth weight, preterm birth, and infant mortality. Some medical risk factors can also affect the health of the mother and child. It is shown that only 47% of adolescents receive adequate medical supervision in the first trimester of pregnancy, while this figure is about 78% among women aged 20 years and older. Only 11.6% of adolescents receive adequate follow-up in the later stages of pregnancy, and 5% do not go to medical institutions at all during the entire pregnancy.

In recent years, the medical and social aspects of youth reproductive health have become particularly relevant in connection with the problem of qualitative and quantitative reproduction of the population, as well as the deterioration of the health of mothers and their children. WHO states that the optimal age for giving birth to a child is between 20 and 30 years. Both early (under 19 years of age) and late (over 35 years of age) births are more likely to have an adverse effect on the health of women and children (9,23). Currently, the problem of pregnancy and childbirth in young women remains urgent. The rate of pregnancy in minors ranges from 143 cases per 1000 women in developing countries in Africa to 2.9 per 1000 women in Japan and South Korea (5,21). In Russia, the birth rate among women aged 15-19 in 2014 was 26 per 1000. Of the total number of births that occurred in the Russian Federation in 2014, births in women 15-19 years old accounted for 4.55%: 88,370 cases out of 1,942,683 (17).

Pregnancy and childbirth at a young age are associated with a large load on the immature body of a teenager. Over the past decade, the overall somatic and reproductive health of adolescents has deteriorated. About 75-86% of girls have chronic somatic diseases, 10-15% - gynecological disorders that limit their fertility. Naturally, in such conditions and against the background of a low level of somatic health of minors, the gestational process proceeds with a significant number of complications that adversely affect the condition of

a young woman, her fetus and newborn (Aylamazyan, Kulakov, Radzinsky, Saveleva, Obstetrics National guide, 2011: 1200).

Most often, pregnancy at a young age is the result of an extramarital relationship, associated with a change of sexual partners, so during pregnancy in this age group, colpitis is 1.5 times more likely to be registered. In addition, in the period of 24-35 weeks, almost half of them have infectious and inflammatory processes that are localized in most cases in the urogenital tract and skin (pyoderma).

Anemia in young people is the leading frequency among all complications, and is diagnosed in the majority of pregnant women 78%. In the group of 14-15 years, 60% of cases show early toxicosis (Bryukhina, Maznaya, Rybalova, Features of pregnancy, childbirth and the postpartum period in adolescence, 2011, Moscow).

The second most frequent pathology is preeclampsia 76.55 per cent (Gurkin, Susloparov, Ostrovskaya, Foundations of juvenile obstetrics, SPb, 2011, p. 351). It is marked by an earlier occurrence of gestosis symptoms in young patients (2 weeks earlier). AFN in the structure of pregnancy pathology ranks third 76.0% (Tyutyunnik, Zaidieva, Burlev, Features of pregnancy and the outcome of childbirth in chronic placental insufficiency and infection. The problem of reproduction, 2012, 4: 41-45), and the threat of termination of pregnancy is 49.9 % (Sinchikhin, Kokolina, Mamiev, Pregnancy and childbirth in minors. Pediatrics, 2012; 3: 93-96).

Childbirth in adolescence is characterized by a more frequent development of various complications: birth abnormalities 37.2%, untimely outpouring of amniotic fluid 45.3%, bleeding in childbirth and the early postpartum period, injuries of the soft birth canal 25.5%, surgical intervention 17%, purulent-infectious postpartum diseases 71.7% (Khamoshina, Kaigorodova, Kotik, Features of childbirth in young women; 2010, Moscow).

The reason for the frequent development of weakness of labor in adolescents is a low hormonal background, immaturity of the cervix due to the slow formation of the biological readiness of the body of minors for childbirth. For the same reason, discoordination of labor activity may develop.

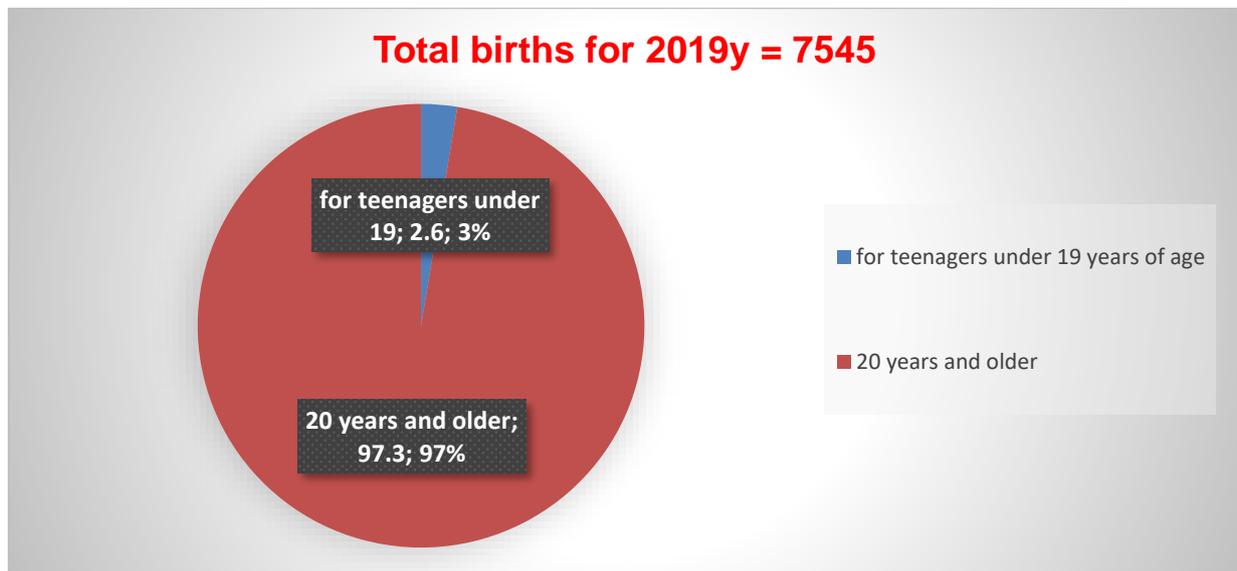
These problems dictate the need to study the peculiarities of pregnancy and childbirth in adolescent girls and develop a comprehensive system of medical and organizational measures aimed at improving the health of young pregnant women.

**The purpose of our study** was to identify the features of pregnancy and childbirth, the postpartum period in young mothers.

## MATERIALS AND METHODS

A retrospective analysis of the birth history of 299 puerperants' maternity hospitals was performed. The research material was archived data from the Regional Perinatal Center No. 3 in Turkestan (Kazakhstan). The main (1) group was formed by 199 puerperants' women under 19 years of age (2019). The control (2) group was formed by 100 puerperants' women aged 20 to 30 years, whose sexual life began after the age of 18.

The survey of adolescent girls began with a survey and anamnesis study, and then proceeded to their examination. All



**Figure 1.** Childbirth in adolescents

survey data were entered in a specially designed questionnaire, which included both General clinical and special methods of examination, and anamnestic data containing information about the somatic and obstetric-gynecological status.

The protocol of the clinical examination consisted of anamnesis, which included the following indicators: age, marital status, age of sexual debut, age of sexual partner, profession, presence of bad habits, social status, state of somatic health. The state of somatic health was assessed by 23 parameters, including age, mass-growth index, childhood infections, and the presence of chronic diseases of the cardiovascular and urinary systems. Special attention was paid to the presence of a history of infectious diseases, including sexually transmitted infections (STIs). We found out in detail the gynecological history; the age of menarche, the nature of menstruation and their regularity, the presence of a history of inflammatory diseases of the pelvic organs. The study of reproductive history included the number of pregnancies, births, abortions and spontaneous miscarriages, as well as the use of contraception.

An important indicator was the first appearance in the women's consultation in connection with the pregnancy under study. In the beginning of the observation determined the timing of pregnancy, established the position and type of previa, position of the fetus, measured the abdominal circumference and height of standing of bottom of uterus. Assessed locomotor activity and the nature of the fetal heart.

Data on the course of pregnancy, childbirth and the postpartum period were determined based on 39 parameters that allow assessing the course of pregnancy. The assessment of the state of health of newborns, the dynamics of its changes during the period of stay in the maternity home and the subsequent outcome (discharge, transfer to another medical institution) were formed taking into account standard parameters. The clinical and laboratory examination included generally accepted clinical methods in the conditions of women's consultation and maternity home: clinical blood analysis, determination of group affiliation and RH factor, blood testing for HIV, hepatitis and syphilis, General urine analysis and urine analysis for Nechiporenko. The study of the

microflora of the genital tract at the initial examination and in dynamics, as well as bacteriological and bacterioscopic examination of the discharge from the cervical canal, which was carried out by polymerase chain reaction. 189 patients underwent colposcopic examination according to the generally accepted method.

To assess the condition of the fetus in young pregnant women, ultrasound and Doppler studies were performed, during which the state of the utero-placental and Feto-placental blood flow was evaluated.

Contractile activity of the uterus in childbirth was determined by a non-invasive method using a fetal monitor "Tone". Statistical processing of the research results was carried out on a personal IBM compatible computer in accordance with generally accepted methods of statistical processing in medicine (Peri and Sabin, 2016). The quantitative results were processed using Microsoft Excel for Windows XP and a special program SPSS Statistics 18 version with the determination of the average value, standard deviation, confidence value and student's test. The Reliability of differences was evaluated based on nonparametric Wilcoxon-Mann-Whitney criteria for unrelated populations and the method of variation statistics using the T-test for paired independent samples. Correlations were considered reliable at the significance level  $p < 0.05$ .

## RESULTS

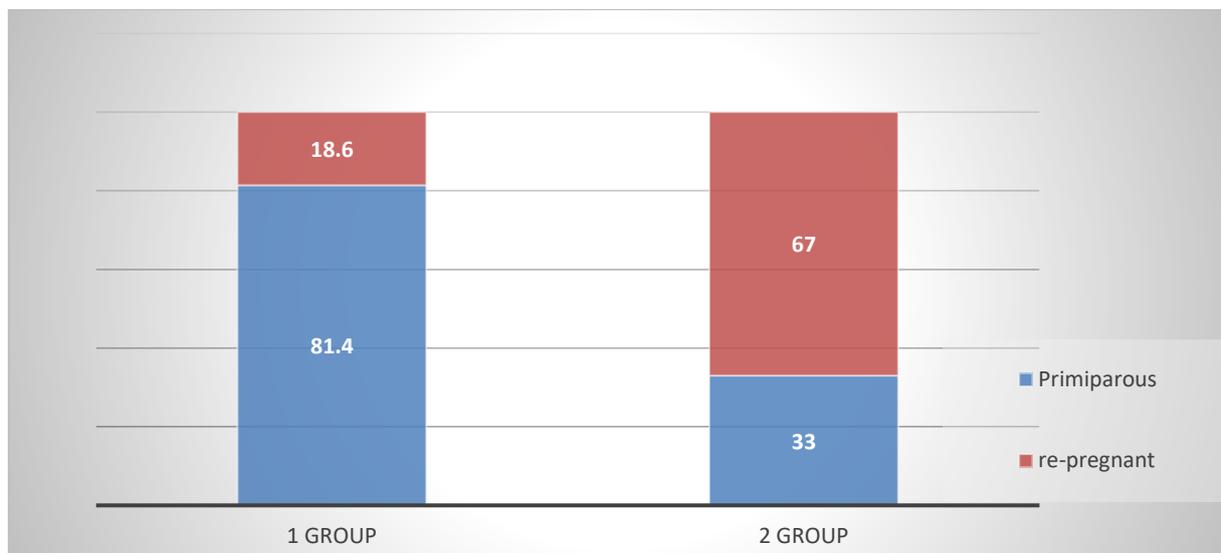
The age of the surveyed women in group 1 ranges from 15 to 19 years, averaging ~16.9 years. 17-year-old girls predominated (66.7%). The average age of women in group 2 was ~25.8 years. In total, 7545 deliveries were made at the Perinatal Center in 2019, 551 of them premature, which was 7.3% of the total number of births. Out of 7545 deliveries, 5857 (77.6%) were delivered by natural birth, and 1688 (22.3%) were delivered by caesarean section.

As can be seen in **Table 1**, the number of births in the adolescent period remains almost the same with slight fluctuations. Carrying a pregnancy in adolescence is a serious test, since the gestation process takes place in conditions of

**Table 1.** Data of childbirth in adolescents in comparison

Nº	Name	2016	2017	2018	2019
1	*Births in the age category below 19 years	3%	2.1%	2.4%	2.6%
2	Births in the age category above 19 years	96.9%	97.8%	97.5%	97.3%
3	Total births (absolute number)	8723	7986	7373	7545

Note: \* -  $p < 0.05$  in comparison with the control group

**Figure 2.** Ratio of re-pregnant to primiparous

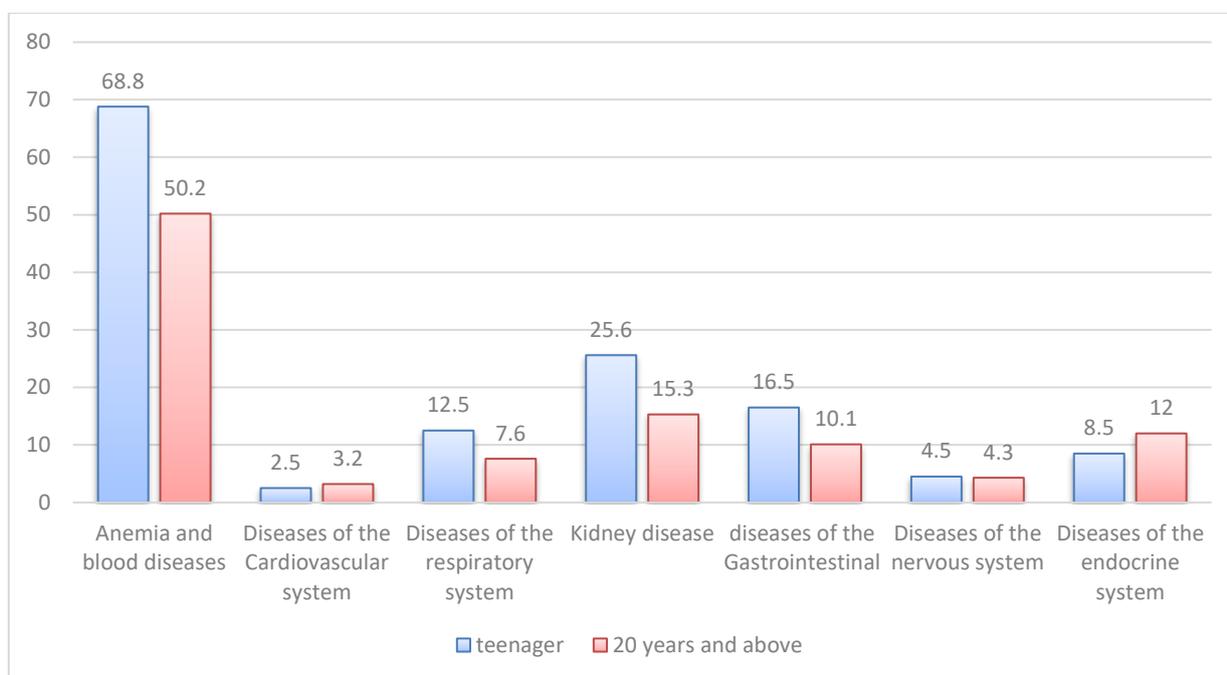
functional immaturity of the body, inadequate adaptive mechanisms and incomplete psychosexual development, and the lack of dynamics towards a decrease in the number of births indicates the questionable effectiveness of measures to provide information on contraception and family planning among the younger generation. The vast majority of women surveyed were pre-pregnant in group 1 – 162 women 81.4%, and group 2 was dominated by re-pregnant women-100 women 34-34%, re-pregnant women in group1-37-18,6%, and group 2 re-giving birth 67-67%. By nationality, the distribution occurred as follows in the group of teenagers was the Kazakhs 56.7%, Uzbeks -41.7%, Russian-1.5% and in the comparison group a similar pattern associated with the major national masses in the region Kazakh women 59%, Uzbeks 40%, Russian 1%. By marital status at the time of birth, 62.8% of the first group were married (registered, civil), 37.1% were unmarried, and 89% and 11%, respectively, were in the comparison group. According to the place of residence in the adolescent group, urban residents 125-62, 8%, rural 74-37, 1%.

Out of 199 teenagers were students 67 (33,6%), 132 (66,3%) they had a secondary school education. Out of 67 students, 5 (7.4%) were enrolled in higher education institutions and 62 (92.5%) were enrolled in secondary education institutions. In the comparison group, out of 100 maternity hospitals, 56 (56%) had higher education, 21 (21%) had secondary special education and 25 (25%) had secondary school education. The data obtained in the course of the analysis allow us to determine the contingent where to focus information and educational work of youth centers, pediatricians, obstetricians and gynecologists on reproductive health and family planning.

About 95% of teen pregnancies are unplanned pregnancies. In various countries around the world, about 21% of girls between the ages of 15 and 19 become pregnant every year. Every year in the USA, 30,000 pregnancies are registered among girls under the age of 15. Six out of ten American women

who have a child under the age of 17 become pregnant again before the age of 19. Out of 199 pregnant women, 111 mothers planned pregnancy, which was 55.7%, and 44.2% of women who gave birth did not plan pregnancy. At the same time, only 15.5% (33 women) received pre-gravidar training and sought medical help for family planning among adolescents under 19 years of age, while the remaining 83.4% (166 women) did not seek medical help before pregnancy. In the 2nd control group, 41% (41 women) received pre-gravidar training, and 59% did not pass a medical examination and preparation for pregnancy. The small percentage of women who applied for pre-gravidar training, even in the older group, indicates a lack of awareness of the population as a whole about family planning and professional prevention of folate-dependent malformations. In the group of adolescent births, out of 37 re-pregnancies, 6 (16.2%) women had uterine scars after the first delivery by caesarean section, and this pregnancy and all 6-100% were delivered by caesarean section. Of the 37 women with repeated pregnancies, 17 (45.9%) had a history of unsuccessful pregnancies: spontaneous miscarriages, abortions for medical reasons, and frozen pregnancies. The remaining 54% (20) of pregnant teenagers were able to carry the pregnancy to full term and give birth on time. One of the most important problems of juvenile obstetrics remains the high risk of repeated pregnancy and childbirth among adolescent girls. Repeated births in minors are associated with a low level of education, dependence on state support, and high infant mortality. Repeated childbirth in adolescents is an adverse factor for the mother and her children due to the aggravation of the socio-economic situation, as well as a small gap between pregnancies.

In a large study conducted by Chantrapanichkul and Chawanpaiboon (2013), it was found that underage mothers had a 15% higher rate of preterm birth during repeated pregnancy, if the interval between pregnancies was less than



**Figure 3.** Incidence of extragenital pathology

18 months. Also, adolescents under 16 years of age are more likely to have a second birth of a child with hypotrophy. In a major literature review, it was demonstrated that re-pregnancy occurs in 19 % of adolescent mothers within 1 year of delivery and in 38 % within 2 years of the birth of their first child. The main factors associated with repeated pregnancy in adolescence include not being able to return to school within 6 months after giving birth, living in a marriage, having child-care assistance from relatives, and not using contraception for 3 months after giving birth. Another important factor that affects the onset of re- pregnancy in adolescent mothers is the presence of postpartum depression. In a study involving 269 adolescents, it was found that depressive symptoms may be an independent risk factor for subsequent pregnancy. The authors found that 46 % of adolescents who became pregnant again within 2 years after giving birth had symptoms of depression. It has also been shown that in most cases, repeated pregnancies are intentional, reflecting a conscious decision not to return to school or school in the near future and to receive support from relatives.

Maternal risk factors can also have a significant impact on pregnancy complications and newborn survival. There were 219 illnesses for 199 adolescents, which was 1.3 per maternity hospital. Iron-deficiency anemia is one of the most common obstetric complications associated with adolescent pregnancy. It is believed that the main cause of its occurrence is malnutrition. Despite the fact that severe anemia during pregnancy is associated with poor health of the mother after childbirth, out of 199 adolescents, anemia was detected in 131 (68.8%) (severe forms of anemia requiring transfusion of blood components to the red blood cell mass 4 cases), the second most frequent were pathologies of the urinary system 51 (25.6%), followed by gastrointestinal pathologies it was detected in 33 (16.5%), respiratory diseases 25 (12.5%), endocrine system 17 (8.5%), and CVS diseases 5 (2.5%). The frequency of vaginitis in the adolescent group was 18%, in the comparison group 9%, which indicates that the set of hygienic and social skills in young women is not yet formed and the available information on sexual health in adolescents is not

sufficient. Vaginitis is a risk factor for maternal injuries during childbirth, as well as a risk for the newborn in terms of increased infection.

The course of childbirth in young pregnant women has anatomical, clinical, and psychological features. Of the 199 births, 129 (64.8%) were classified as pathological and 70 (35.1) as physiological. While in the comparison group, pathological births were recorded in 28 cases (28%) and physiological 72 (72%). Among adolescents, 22 were delivered by caesarean section, which is 11% of the total number of births in adolescents, but despite the fact that the rate of delivery by caesarean section among adolescents is lower than among women under the age of 30, they are at a higher risk of instrumental delivery. It was found that among adolescents under the age of 19, labor induction, fetal vacuum extraction, amniotomy, episiotomy, etc. are used 2 times more often. For 199 births among adolescents, there were a total of 1,6 manipulations per patient. It is believed that the need for instrumental delivery is due to the physical immaturity of the young mother or "fear and lack of cooperation" in the second period of labor. It is also important to note that social support measures (such as home visits) for pregnant adolescents are effective in reducing the frequency of cesarean sections.

Adolescent pregnancy is a risk factor for adverse child outcomes, such as premature birth, low birth weight, fetal growth retardation, neonatal and infant mortality. In the adolescent pregnancy and delivery group, preterm birth occurred in 35 cases, which accounted for 6.8% of the total preterm birth population for 2019, but in the adolescent birth group it was 17.5%. Of the 199 births, 2 were multiple (1%), 197 live births, the percentage of live births among adolescents was 98%, respectively, the stillbirth rate was 2% (4 cases). Out of the number of live births, 25 (12.5%) needed observation in the intensive care unit. In the comparison group, the percentage of newborns transferred to the intensive care unit was 2%. The average weight of a newborn in the group of adolescent births was 3111.7 Gy, in the comparison group it was 3780.1 Gy. During adolescence, the growing fetus and the mother's still-

growing body may compete for nutrients; in addition, immaturity and insufficient blood supply to the cervix can predispose to the development of subclinical infection, an increase in prostaglandin synthesis, which is the cause of premature birth.

One of the main causes of adverse perinatal outcomes in children born to adolescent mothers is hypertensive disorders during pregnancy. The incidence of hypertensive disorders among pregnant adolescents was 19.5% (39 cases), which is 3 times higher (6%) than among women aged 20 to 30 years. Complications that develop in children with severe hypertensive disorders are determined by a complex of hypoxic and metabolic disorders, associated with immaturity of the cardiovascular system, which is the main factor leading to damage to the Central nervous system. The most common pathologies in children with gestosis in the antenatal period are chronic hypoxia and fetal growth retardation, as well as their combination, in the postnatal period – prematurity, respiratory distress syndrome, asphyxia, and cerebral disorders. The results of a study conducted by Ganchimeg and Ota (2014) showed that the risk of developing hypertensive disorders in unborn adolescent girls is 1.7 times higher than in adult patients.

The risk of death in the late neonatal period among children born to adolescent mothers is 1.5 %, compared with 0.7% among mothers aged 20 years and older. The high frequency of perinatal complications is not directly due to the age of the first-born, and the most important are social risk factors, such as bad habits, insufficient financial security, unregistered marriage, burdened somatic and obstetric-gynecological history.

According to a large prospective study conducted by Chen and Wen (2007), childbirth in adolescents under 18 years of age was associated with a significant increase in the frequency of fetal hypoxia in childbirth and, consequently, a lower rating on the Apgar scale. In addition, it has been shown that among children born to adolescent mothers, the risk of low birth weight is significantly higher. As in most other studies, high infant mortality was found, which is largely associated with a high rate of preterm birth in adolescents. According to the study, the risk of maternal mortality was higher among patients under the age of 16 and correlated with socio-demographic factors, such as poverty, low level of education, insufficient prenatal care, and social status.

## DISCUSSION

One of the limitations of many studies of adolescent mothers is the lack of information about whether pregnancy is desirable, while this may affect a woman's behavior during pregnancy and her attitude to prenatal care. In addition, the prevalence of dietary disorders, alcohol and drug abuse, is higher among adolescents, which can negatively affect unplanned pregnancy. Children born to adolescent mothers have a higher risk of maternal maltreatment and higher rates of chronic disease, a higher incidence of accidents and injuries, and behavioral and emotional disorders. It is important to note that the higher prevalence of behavioral problems in children born to adolescent mothers is mainly due not to the young age of the mother, but to her psychological state when raising the child. Literature data shows that the social and psychological difficulties associated with early birth of the first child are long-

term. However, there is no evidence that providing social support to pregnant adolescents, for example, with additional home visits, reduces the incidence of disease among infants. Research has shown that children born to adolescent mothers are at risk of developing cognitive and social deficits. Adverse social conditions, including lack of interaction with parents, child abuse, psychological violence in the family, verbal abuse and threats of physical violence during this critical period of development can have a profound impact on the formation of neural connections and neurotransmitter networks, potentially leading to impaired brain development in children from adolescent mothers.

The frequency of teenage pregnancy in the dynamics of years does not tend to decrease, among young mothers only every 6 received pre-pregnancy training, and every 5 was re-pregnant, and among re-pregnant women under 19 years of age, 45.9% had no experience of unsuccessful pregnancy in the anamnesis, and only 54% of re-pregnant women with this pregnancy were able to carry the pregnancy to full term. Of those who gave birth in their Teens, only one-third were students, two-thirds had secondary school education, and of this number of students, only 7.4% were enrolled in higher Education, and the remaining 92.5% were students of Secondary educational institutions. Preventive work to prevent unplanned and adolescent pregnancies can be effective if the work is strengthened with this contingent. Girls who become mothers at an early age and have a low level of education are at high risk of re-pregnancy with short intervals between each child. The level of education among adolescent girls is highly correlated with their reproductive behavior and their level of health awareness. The onset of repeated pregnancy before the age of 19 in 18.5% indicates the ineffectiveness of contraceptive measures and family planning, in all 37 cases of repeated pregnancies, the recommended 2-year intergenetic interval was not maintained in 100%.

## CONCLUSIONS

Childbirth in adolescence is associated with a high frequency of pathological deliveries (only 3 out of 10 physiological deliveries), a high frequency of instrumental interventions, a high frequency of maternal and perinatal injuries, and hospitalization of newborns in intensive care wards.

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