

## Research Article

# A Disorder of Menstrual Function Regularization and its Influence on a Female Reproductive Potential

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**Abstract**

Obstetric complications in women of reproductive age are often the result of puberty disorders which remain underestimated and not taken into account in pregnancy monitoring programs in such patients, leading to an increase of habitual non-carrying of pregnancy and negative obstetric effects.

**The objective of the research** is to carry out a comprehensive multivariate assessment of the disturbances of the body adaptive processes in teenage girls, taking into account the data of anamnesis regarding the specifics of menstrual function regularization during puberty, and to determine the main factors of complicated pregnancy in this category of patients.

**Materials and methods.** To carry out the task, 110 pregnant women with a disorder of menstrual function regularization have been prospectively examined (the main group); the examination was performed at the preconception stage and in the periods of 6-12, 22-24 and 32-36 weeks of pregnancy. The comparison group consisted of 30 patients with a normal menstrual cycle. In order to identify risk factors and predict complications, the odds ratio (OR) and its 95% confidence interval were used.

**Results.** Extragenital pathology plays a significant role in the formation of pathological course of puberty and obstetric complications; 87.27% of such cases were demonstrated in our study. Among the disorders of the ovarian-menstrual cycle, the structural significance is characteristic to the failure of the luteal phase and anovulatory disorders (78.18% of cases). Gynaecologic pathology includes inflammatory diseases of the pelvic organs (35.45%), cervical background processes (41.66%), ovarian tumour lesions (21.81), and primary infertility (14.54%). The obtained results of the structure of pregnancy complications in patients of the main group show reproductive losses in early pregnancy (11.8%), subchorionic hematoma (28.18%) and the threat of late spontaneous abortion; these data are noted three times more often than in the comparison group. Many cases of preeclampsia (28.18%), gestational anaemia in more than half of the observations, fetal distress during pregnancy (32.72%) and birth of children with a low weight (17.27%) are associated with the development of the primary placental dysfunction and pathology of vascular and thrombocytic component of haemostasis.

**Conclusions.** Analysis of the obtained data confirmed that pregnant women with a disorder of menstrual function regularization in puberty are characterized by a significant number of complications during pregnancy and delivery, high rates of spontaneous abortions and missed miscarriages; all these facts should be considered as potential risk factors. The key factors are the following: endocrine imbalance by type of oligomenorrhea and luteal phase deficiency (OR – 9.16; 2.21-23.24), inflammatory diseases of the genital tract, such as asymptomatic bacteriuria and bacterial vaginosis (OR – 14.26; 3.26-32.12), premature delivery in past medical history, the risk of spontaneous miscarriages and subchorionic hematoma.

**Keywords**

pregnancy; a disorder of menstrual function regularization; factors of pregnancy and childbirth complications; state of newborns

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## Problem statement and analysis of the recent research

Needless to say, the disorders in physical development of a teenage girl, frequency and nature of childhood and adolescence diseases, characteristics of menstrual function regularization and disturbances of the hypothalamic-pituitary-ovarian regulation of ovarian-menstrual cycle have a significant impact on her further reproductive function, gestation course and childbirth, and the state of a woman's health determines her reproductive behaviour and significantly affects the fertility and perinatal morbidity and mortality [1-3]. Physiological instability of the hypothalamic-pituitary-gonadal system in

pubertogenesis and the increased sensitivity of an adolescent girl's body to the influence of the environmental and internal factors create the appropriate basis for impaired premonitory background of the body of a mother and woman-to-be [2, 6], which, along with hereditary conditionality can promote the multi dysfunctional state with clinical manifestation of gynaecological diseases [1, 4, 6]. Most of these pathological conditions of dyspubertogenesis are endocrine-dependent, its diagnostics is not always well-timed, and the therapy is absent or low effective, as a rule [3, 4]. It should be mentioned that obstetric complications in women of reproductive age are often a result of puberty disorders. They are still underes-

timed and not included in the program of pregnancy monitoring; consequently the number of miscarriages is increased [4-6].

**The objective of the study** is to carry out a comprehensive multivariate assessment of the disturbances of the body adaptive processes in a teenage girl, taking into account the data of anamnesis regarding the specifics of menstrual function regularization during puberty, and to determine the main factors of complicated pregnancy in this category of patients.

## 1. Materials and methods

To carry out the task, 110 pregnant women were prospectively examined at the preconception stage in the periods of 6-12, 22-24 and 32-36 weeks of pregnancy. Taking into account the anamnestic characteristics of the puberty period, the study included 30 patients with late menarche, 40 patients with oligomenorrhea, and 30 patients with dysfunctional uterine bleeding of puberty period (they formed the main group). The comparison group consisted of 30 patients with a normal menstrual cycle. Clinical, laboratory, functional and instrumental methods of examination were used during the research. Particular attention was paid to anamnestic data, namely: the nature of menstrual function regularization, the age of menarche, peculiarities of the ovarian-menstrual cycle, extragenital diseases, metabolism and endocrine disorders, treatment and rehabilitation. Statistical processing of material was performed with the help of a personal computer and Microsoft Excel using the STATISTICA for Windows®-6.0. Odds Ratio, OR, and its 95% confidence interval (95% Confidential Interval, 95% CI) were used to identify risk factors and predict complications.

## 2. Results of the study and their discussion

Characterizing the age of women included in the study, it should be noted that in the main group the average age of patients was  $(22.6 \pm 0.8)$  years, in the comparison group –  $(29.8 \pm 0.4)$  years ( $p > 0.05$ ). It suggests the probability of primary placental dysfunction development and negative gestational effects in the case of dispuberatogenesis in young primiparas. Disturbances of the adaptive capabilities of an adolescent's body during puberatogenesis are caused by hereditary, somatic, neurohumoral and other factors that determine the peculiarities of obstetric and gynaecological pathologies in the future. It should be noted that extragenital pathology plays an important role in the formation of the pathological course of puberty and obstetric complications (87.27%). Among the somatic diseases in women of the main group, a significant number of childhood infectious diseases was noted: (measles, rubella, parotitis, chicken pox). Study of the structure of extragenital pathology showed a structural significance of diseases of the cardiovascular system (19.09%); urinary system and musculoskeletal system (23.63%); endocrine system (20.90%); every fifth patient at the preconception stage

had signs of anaemia of varying degrees of severity.

The average age of menarche in the main group was  $(14.7 \pm 1.4)$  years, the late menarche was noted in 27.27%, algomenorrhea was found in 39.09% of the observations, premenstrual syndrome – in 44.53%, excessive menstruation – in 38.18% of cases. A lot of the ovarian-menstrual cycle disturbances are caused by luteal phase failure and anovulatory disorders (78.18%). 48.18% of girls had early sex (up to 17 years), 51.81% of patients had two or more sexual partners, 56.36% of girls did not use contraception, which closely correlates with the episodes of mixed infection in anamnesis in almost half of the patients (44.54%). Gynaecologic pathology is represented by inflammatory diseases of the pelvic organs in 35.45% of cases, background processes of the cervix – in 41.66%, ovarian tumours – in 21.81% and primary infertility – in 14.54% of observations. Bacterial vaginosis was diagnosed in 47.27%, non-specific bacterial vaginitis – in 25.45% of observations, asymptomatic bacteriuria – in every fourth patient.

The obtained results of the structure of pregnancy complications in patients of the main group showed reproductive losses at the early stages of pregnancy (11.8%), a high proportion of subchorionic hematomas (28.18%) and the threat of late involuntary miscarriage; these data are noted three times more often than in the comparison group, which indicates an inadequate function of the corpus luteum at the stage of unfinished placenta formation. At the same time, the high rate of infectious diseases is noticed: asymptomatic bacteriuria (19.09%), dysbiosis and nonspecific vaginitis of the genital tract (28.18%), which is 3.4 times more often compared to the data of the comparison group. A high proportion of late spontaneous miscarriages (12.72%) and preterm births (14.54%) which are associated with premature rupture of fetal membrane and isthmic-cervical insufficiency can be explained by a significant percentage of the urogenital infections. Many cases of preeclampsia (28.18%), gestational anaemia in more than half of the observations, fetal distress during pregnancy (32.72%) and birth of children with a low weight (17.27%) are associated with the development of the primary placental dysfunction and pathology of vascular and thrombocytic component of haemostasis in patients with juvenile uterine bleeding in the anamnesis.

The labor in patients of the main group was often complicated by such conditions as premature rupture of the fetal membrane (28.18%), abnormalities in labor (32.72%), and operative delivery (30.90%). Abnormalities of labor in combination with an imbalance of fibrinolytic and procoagulant properties of the hemostasis system led to hypotonic uterine bleeding 5.2 times more often compared with the data in the comparison group. The neonatal period was accompanied by the development of such complications as cerebral ischemia, morphofunctional immaturity and hyperexcitability syndrome in one third of newborns.

During the instrumental study it was found the disparity of fetometric data in fetal size already at 28-32 weeks of

pregnancy; the divergences noted by placentography were the following: hypoplasia of placenta (25.46%), ultrasonographic markers of placental dysfunction (47.27%), hydramnios (32.72%), hypamnions (28.18%), signs of reduced vascularization of chorionic villi, increased calcification in placental tissue structure and “premature aging of the placenta”. The deviation in indicators and nature of haemodynamics of uterine arteries and blood vessels of the umbilical cord was revealed in 52.72% of cases. Despite the lack of significant differences, we found that in the group of women with a disorder of menstrual function regularization, the placental dysfunction diagnosed before 20 weeks gestation, happened 2.5 times more often. The formation of fetal growth retardation syndrome may be explained by early development and impaired adaptive processes in placenta. The increase in resistance indices, pulsation indices in vessels of the uterine-placental complex and systole-diastolic ratio revealed a placental circulation disorder and an increased risk of negative pregnancy outcomes in this category of patients.

The analysis of the data allowed stating that on the basis of anamnesis, the group of pregnant women with a disorder of menstrual function regularization in puberty is characterized by a significant proportion of complicated pregnancies and births, high rates of inevitable and missed miscarriages, which should be considered as potential risk factors.

The results of the case history, frequency and nature of disorders of ovarian-menstrual cycle, pregnancy and childbirth allowed assessing the significance of the leading factors and predicting the risk of placental dysfunction in this category of patients. One of the important factors is the endocrine imbalance, which is characterised by increasing number of neuroendocrine disturbances such as menstrual disorders, ovarian dysfunction, high frequency of luteal phase deficiency and hypoestrogenic endocrine profile in patients of this category. The disorders of ovarian-menstrual cycle by type of oligomenorrhea and luteal phase deficiency (OR – 9.16; 2.21-23.24), inflammatory diseases of the genital tract, such as asymptomatic bacteriuria and bacterial vaginosis (OR – 14.26; 3.26-32.12) are closely related to the development of placental dysfunction. Obviously, the presence of bacterial infection increases the chance of placental dysfunction and pregnancy complications in 14.0 times. Subchorionic hematoma and bleeding episodes are also valid predictor of placental dysfunction and gestational complication related to it increasing fourfold the chances of developing placental dysfunction (OR – 4.96; 1.29-13.40).

The obtained data indicate that the peculiarities of pregnancy, especially in patients with a disorder of menstrual function regularization, is the result of a large number of factors that influence by various, often cross, pathophysiological ways, so, it's not always possible to identify a dominant factor with the help of modern diagnostic methods. However, identification of the potential factors and their predictive value is important for the formation of the risk group and development of preventive measures program.

### 3. Conclusions

As a result of the scientific research, we have new data on the frequency and structure of somatic pathology, peculiarities of ovarian-menstrual cycle, pregnancy and childbirth in women with a disorder of menstrual function regularization in their anamnesis that allowed to confirm the pathological influence of dispubertogenesis on the regularization of the female reproductive system, and a significant increase in the risk of obstetric and perinatal complications during pregnancy.

The obtained results of the peculiarities of the anamnesis, frequency and nature of the ovarian-menstrual cycle disorders, pregnancy and childbirth allowed assessing the significance of the leading factors and predicting the risk of placental dysfunction in this category of patients. The key factors are the following: endocrine imbalance by type of oligomenorrhea and luteal phase deficiency (OR – 9.16; 2.21-23.24), inflammatory diseases of the genital tract, such as: asymptomatic bacteriuria and bacterial vaginosis (OR – 14.26; 3.26-32.12), premature delivery in past medical history, the risk of spontaneous miscarriages and subchorionic hematoma.

In women with a disorder of menstrual function regularization in puberty the pregnancy is accompanied by a high percentage of early reproductive losses, the risk of spontaneous abortion and miscarriage, preeclampsia and placental dysfunction. These factors cause complicated delivery and pathology of early neonatal period due to the hypoxic-ischemic central nervous system impairment and the respiratory distress syndrome.

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