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Risk Factors Promoting the Formation of Disorders of the Menstrual Cycle in Teenage Girls. Literature Review

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ABSTRACT

This article presents data on the study of the results of scientific research of domestic and foreign scientists in recent years, devoted to the problem of pediatric gynecology, in particular to the problems and various disorders of the menstrual ovarian cycle in adolescence. The authors argue that there are many unresolved issues regarding etiopathogenesis and treatment of these problems.

KEY WORDS:menstrual ovarian cycle, dysmenorrhea, teenage girls, oligomenorrhea, hypermenorrhea, hormonal disorders.

The health of children and adolescents is a priority for the health care of any state. Since it is they who will ensure the health of the nation in the near future. It is widely known about the high prevalence of gynecological diseases in the population of children and adolescents, reaching according to some data up to 60%. The state of the reproductive health of modern girls is a factor that will determine the reproduction of the population and the demographic situation [10].

In practical healthcare, menstrual irregularities in puberty are established only with pronounced clinical manifestations, and therefore there are no prevention and early treatment. A few studies are devoted to the study of the role of perinatal and postnatal risk factors in the development of pathology of the formation of menstrual function [5, 8]

Currently, there is no doubt that the reproductive function of an adult woman largely depends on natural and harmonious development of all her links in childhood and during puberty [1]. All stages of the formation of the function of the girl's reproductive system during the first 18 years of her life are preparation for future motherhood and largely determine the health of not only the woman, but also her offspring. In this regard, the protection of the health of girls and adolescents is one of the primary tasks of the national policy of the state [2,22].

The functional state of the higher nervous activity, which controls the mechanisms of regulation of the reproductive system, is unstable during puberty; the receptor apparatus of the uterus and ovaries is imperfect. Active exogenous and endogenous stimuli can easily disrupt the regulatory mechanisms of the reproductive system. That can be clinically manifested by uterine bleeding and dysmenorrhea. For most adolescent girls, complex drug therapy is effective, and during the first year they develop ovulatory menstrual cycles and normal menstruation.The prognosis for uterine bleeding during puberty associated with pathology of the hemostasis system or systemic chronic diseases depends on the degree of compensation for existing disorders. Girls who remain overweight and have recurrent uterine bleeding at the age of 14-19 should be included in the risk group for the development of endometrial pathology [10, 12, 30].

All over the world, one of the factors that worsen the quality of life of girls and adolescent girls is the pain syndrome that accompanies the physiological process - menstruation. According to the WHO, the prevalence of menstrual pain syndrome in the structure of adolescent gynecological pathology is extremely high, with about15% of them characterizing menstrual pain as excruciating. Juvenile dysmenorrhea - painful menstruation in girls under 18 years oldwithout pelvic pathology is a common and often debilitating gynecological suffering regardless of age or nationality[11,17].

Despite its high prevalence, primary dysmenorrhea in girls is often poorly diagnosed and even ignored by health care providers and by girls themselves and their mothers, who may accept painful periods as a normal part of the menstrual cycle. Algodismenorrhea is one of the

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most common types of gynecological pathology. Painful menstruation is observed in 31-52% of girls and women aged 14-44 years, and in about 10% of them the pain is so intense that they lose their ability to work. Monthly painsaffect the general well-being, the emotional,mental state of women.Therefore, algomenorrhea is considered not only as a medical, but also as a social problem. The role of mental factors in the genesis of primary dysmenorrhea is essential [3,24,25].

According to numerous studies, the reproductive potential of modern teenage girls is low due to the high overall morbidity. The incidence rates of somatic diseases among teenage girls are 10-15% higher than among boys. An increase in gynecological morbiditydirectly depend on the frequency of somatic pathology[4,5, 29].

Menstrual irregularities have recently been considered one of the most common diseases in the gynecology of children and teenage girls; according to statistics, they occur in almost every third girl. There are usually two large groups of disorders:as the type of hypo- and hypermenstrual syndromes [6, 28].

In the structure of menstrual irregularities in teenage girls, primary dysmenorrhea was 78.3%; secondary - 6.6%; oligomenorrhea - 8.5%. Menorrhagias were found in 4.4%, primary and secondary amenorrhea in 1% and 1.6%, respectively. Dysmenorrhea is one of the most common gynecological diseases among teenage girls. The incidence of dysmenorrhea in girls ranges from 43 to 90% [7, 26].

The urgency of this problem is that, on the one hand, it causes anincrease in the rate of gynecological pathology among teenage children in recent years, and on the other hand, by their severe socio-demographic consequences, expressed in a decrease in the reproductive function of young people, the occurrence of anxiety and depressive disorders in this category of girls, which creates difficulties in the family and in the process of schooling, leads to social communication of teenage [8, 27].

In the group of examined teenage girls with various menstrual dysfunctions, iron deficiency states, the presence of various degrees of anemia in the mother, prematurity and late toxicosis of pregnancy, which are shownin anamnesis, are much more common as a causative factor. It draws attention to the fact that iron deficiency during pregnancy in mothers of teenage girls was most often detected in the group of patients with iron deficiency anemia. In the same group, artificial feeding was more common in the anamnesis, which occurred in 23%. Obviously, additional factors that influence canbean increased incidence of cases of unbalanced and irregular nutrition, abuse of reduced diets in the form of deliberate starvation and adherence to various diets, insufficient consumption of meat products [9,26,27].

In scientific research Kokolina V.F., Rubets E.I. (2012) the cause of pathology can be vitamin deficiencies, hormonal disorders, mental trauma, infectious diseases, gynecological interventions, liver disease, obesity. An important role in the development of menstrual irregularities is played by a genetic predisposition.

The most common pathology in children and teenagaresof all age groupswere inflammatory diseases. Including both vulvovaginitisand inflammatory diseases of the internal genital organs. From the data presented by researchers, an increase in the incidence of inflammatory diseases of gynecological organs in children and teenagers is obvious.As the authors point out, it is undoubtedly associated with an increase in the number of unexamined girls and indicates a large number of undiagnosed inflammatory diseases in the contingent of this category [10].

The leading role of hyperandrogenic states in the structure of endocrine disorders in Armenian girls of pubertal age emphasizes the authenticity of this pathology for this ethnic group and indicates that the problem of endocrine infertility in the Armenian population begins already at puberty. Based on the literature data, as well as on our own experience, we believe that early elimination of endocrine disorders, already in puberty, will avoid problems with childbirth in the future [11].

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According to O.V. Bulganina, E.E. Grigorieva (2014), the results of determining the main risk factors for the development of menstrual dysfunctions in teenage girls made it possible to determine the significance of each factor separately and their total impact on the menstrual cycle. The most significant were damaging factors such as pregnancy with complications, complications in childbirth, acute respiratory infections up to a year, childhood infections, frequent colds, chronic somatic pathology, increased physical and mental stress - integrated indicator = 1.6-2.3) [12]. Girls who were born prematurely were more likely to have menstrual dysfunctions during puberty [13].

Based on the theory of dysmenorrhea, which is conducted a violation of the synthesis and metabolism of arachidonic acid and its metabolic products (prostaglandins, leukotrienes, thromboxanes, etc.), many researchers [7,9,14,16] consider the use of non-steroidal anti-inflammatory drugs (NSAIDs) sufficient in combination with antioxidants. In a number of pathogenetic mechanisms of the development of dysmenorrhea, there is a hypothesis of a decrease in the level of progesterone in the luteal phase of the menstrual cycle,connectivelyit ishighly effective touseprogestogenscombined with oral contraceptives in the treatment of dysmenorrhea.

A change in the ratio of sex steroids in the premenstrual period (estradiol and progesterone) is accompanied by a change in the rate of oxidation of free fatty acids; increased release of oxytocin, vasopressin, bradykinin, relaxin and biogenic amines in the myometrium; activation of the synthesis of cyclooxygenase and prostaglandin synthetase. These processes potentiate the formation and release of prostaglandins. Hyperprostaglandinemia contributes to hypoxia and ischemia of the myometrium, which leads to spastic contractions of the uterus, causing pain syndrom.

Uvarova E.V., Gainova I.G. (2012) suggest that in the genesis of dysmenorrhea, an increase in the concentration of PG E2 with a reduced secretion of progesterone isprimarilyimportant.For the onset of pain, it is necessary to irritate the nerve endings with biologically active substances from the group of kinins, prostaglandins, as well as K and Ca ions, which are normally inside the cells. During menstruation, the integrity of the endometrial cell membranes is disrupted and biologically active substances enter the intercellular space, irritating the nerve endings [14,15,16].

In girls with an irregular menstrual cycle, hormonal changes in the form of a decrease in the function of the thyroid gland (TG) were detected in 16.9% of cases. In addition, the majority of them (63.6%) had the highest prevalence of antibodies, which was the direct cause of thyroid insufficiency. A high prevalence of carriage of antibodies to the thyroid gland (31.3%) was also revealed in girls with normal thyroid-stimulating hormone levels, which requires further dynamic monitoring of this category of patients in order to detect hypothyroidism early [2,17].

Based on the research conducted by E.A. Galushchenko, E.A. Lobanov, it was found that with all variants of prolactin dysregulation, multifocal ovaries, various types of menstrual irregularities, and abnormalities in sexual development are characteristical. Patients with prolactin dysregulation are a risk group and should be subject to dispensary observation by a juvenile gynecologist for up to 18 years, followed by observation in an antenatal clinic [18].

Hypothalamic syndrome of puberty (HSPP), which is based on reversible functional disorders of the hypothalamus as a central structure that regulates all links of homeostasis, is characterized by polymorphism of clinical manifestations in the form of metabolic disorders, neurovegetative and psychoemotional disorders, and dysfunction of the endocrine glands.In somatically healthy girls, the frequency of gynecological disorders is 1,5 times lower than in girls with extragenital pathology. Connective tissue dysplasias (CTD) are systemic disorders and considered as one of the integral indicators of the health of children and teenagers. There is a clear connection between disorders of the formation of the reproductive system and connective tissue dysplasia, trophological insufficiency due to nutritional defects during pregnancy and childhood [20].

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In girls with an irregular menstrual cycle and changes in autonomic regulation, the tension of the sympathetic division of the autonomic nervous system and borderline changes, according to daily monitoring of blood pressure, are noted already in the early stages of the development of the disease, when changes in the hormonal and biochemical status are still minimal and do not go beyond the reference values. These changes can serve as criteria for assigning this cohort of patients to the high-risk group for the development of arterial hypertension and reproductive disorders [21].

According to Kokolina V.F. (2007), an important aspect in solving the problem of early correction of endocrine disorders is publicity work aimed at informing parents about the need to contact medical institutions in case of an irregular menstrual cycle after a year from menarche, as well as in the presence of indirect signs in the formof increased body weight. Considering the hereditary nature of most endocrinopathies, accompanied by hyperandrogenism, it is relevant to examine girls whose mothers had a history of endocrine infertility.

Among the pathological conditions accompanied by the development of ovarian failure, the author identifies the following factors: eating disorder (for example, neuropsychic anorexia), a long period of excessive physical exertion, amenorrhea in chronic infections, intoxications, pituitary adenomas, hyperprolactinemic syndrome, primary or secondary product deficiency gonadotropic hormones, hormone-active and hormone-inactive pituitary tumors, hypercortisolism syndrome, hypothyroidism [11, 27].

Studies by E.A. Stepanova, S.I. Kolesnikov (2016) showed the role of an unfavorable course of pregnancy and childbirth in the formation of pathology of the reproductive system of girls in combination with connective tissue dysplasia. The most significant risk factors in their opinion are: the threat of termination of pregnancy, premature birth, preeclampsia, newborn asphyxia.Dysplasia of connective tissue in childhood and teenage is combined with menstrual irregularities, in particular with hypomenstrual syndrome. The authors suggest that metabolic and hormonal changes in teenagers cause disorders of menstrual function and aggravate the course of systemic connective tissue dysplasia [22,23,28].

Some authors believe that the cause of various disorders is a decrease in the individual threshold for body weight, as well as the physiological relationship between adipose tissue and other body tissues. In girls with anorexia nervosa, there is a decrease in the hypothalamic production of gonadotropin-releasing hormone, and as a consequence - a decrease in the frequency and amplitude of impulse release of luteinizing hormone, a decrease in the concentration of estradiol and an increase in testosterone levels, which is explained by a violation of the metabolism of these compounds as a result of the resulting pathology of enzyme systems [10, 11].

The results of the study Sh.M. Saduakasova, G. Zh. Zhatkanbaeva et al. (2014) showed that the use of the drug nimesulide was effective in the treatment of dysmenorrhea. Due to its analgesic, anti-inflammatory action of the drug, pain relief was noted in all girls of this group with a minimum number of side effects (3.3%). The use of the drug dydrogesterone in the study groups was also accompanied by a persistent therapeutic effect with relief of pain in 93.3% of girls by the 6th month of therapy and restoration of ovulatory menstrual cycles in most patients in 87.0%.In the studies of L.F. Mozheiko, I.V. Dashkova (2014) examined 37 girls aged 12 to 17 years and proved the high therapeutic effect of Dufaston in menstrual irregularities of the type of hyperpolymenorrhea and juvenile uterine bleeding caused by the advantage of corpus luteum insufficiency. According to the authors, due tothe absence of side effects, easyuse and high therapeutic effect of Dufaston can be considered the drug of choice in the treatment of this pathology.

CONCLUSION

Due to the fact that it is at juvenile age that the maturation of hypothalamic structures occurs and the cyclical secretion of gonadotropic hormones is formed, a disorder of the mechanisms of formation and formation of reproductive activity can seriously impair the

reproductive potential of a teenage girl and preventsfrom the successful implementation of the motherhood function in the future.

Thus, according to the analysis of the results of studies of publications in recent years, it is possible to identify the most significant medical and social risk factors that contribute to the formation of menstrual irregularities in girls of puberty, among which the most common are: complications of pregnancy and childbirth in the mother, prematurity, childhood infections, the presence of chronic somatic pathology, increased physical and / or mental stress, as well as the total effects of damaging factors, both in the antenatal period and during puberty.

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CONFLICT OF INTEREST

The authors declare that they have no competing interests.

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