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SOCIAL - HYGIENIC AND MEDICAL-BIOLOGICAL FACTORS OF THE RISK OF CONGENITAL HEART DEFECTS DEVELOPMENT IN CHILDREN

ABSTRACT

The article presents an overview of the main socio-hygienic and medico-biological risk factors of congenital heart defects (CHD) in children. Determination of risk factors is essential in estimating and forecasting the frequency of CHD in the population.

Keywords: congenital heart defect, risk factor, children, pregnant women.

Introduction

Congenital heart defect (CHD) is a heterogeneous group of diseases, including isolated and combined anomalies of multifactorial etiology. In this regard, the study of risk factors for the development of the CHD is one of the key moments in the organization of primary prevention of this pathology. It is well known that most registers are aimed at identifying possible factors that contribute to the formation of mutational processes at both individual and population levels [2, 4]. The leading risk factors for the development of CHD in children can be conditionally divided into three groups: socio-hygienic, medical-biological and external-environmental factors. About 90% of the CHD are multifactorial, depending on the combined effect of hereditary factors and environmental factors [9].

1. Socio-hygienic risk factors for congenital heart disease.

According to a number of studies,

social risk factors include: the age of the mother at the time of childbirth is more than 35 years, the birth of children out of wedlock, the presence of more than four pregnancies in the anamnesis, the level of income in the family, the nature of the mother's nutrition, the level of education of the mother and father [13, 10].

In A.R. Safiullin's study (2012), it was shown that the diagnostic coefficient of congenital septal heart disease in relation to the «incomplete family» sign was maximum - 9 points with a threshold value of 2 or more points; more than four pregnancies - 5 points; coefficient «higher education of mother and father» - had a negative value (-3 and -5 points respectively). Given that the specialties of parents with secondary education and lower secondary education were often associated with the harmful effects of occupational factors (contact with fuels and lubricants, disinfectant solutions, building materials, etc.), the influence of the education level of

parents on the increased risk of birth children with congenital anomalies of the circulatory system. In addition, it can be assumed that parents with higher education control their health more carefully, plan pregnancy more carefully and have better contact with a gynecologist monitoring pregnancy. A more important role in increasing the risk of congenital anomalies may be played by more frequent alcohol, nicotine or drug dependence in pregnant women with a low level of education. At the same time, there was no adverse effect of the living conditions of the family on the increase in the risk of congenital septal heart disease [11].

Several other significant social risk factors were found in the study conducted in Primorsky Krai among children with congenital developmental anomalies. The authors attributed to them the increased urbanization of the territories (83%), the age of the mother under 25 (48.5%), the first pregnancy (42.4%) and

the lack of permanent work (33%) [12].

These findings are confirmed in a study of Zhu Z. (2016), which established as a risk factors for the CHD the low educational level of the mother, the age of the mother over 35, the wrong way of life. When combined, the relative risk of CHD increases to 12.25 [28]. Age of the father at the time of conception, some authors also refer to the risk factors for CHD of newborns [25].

The nature of the mother's diet can also affect the likelihood of the birth of children with CHD. For example, obesity of the mother, inadequate nutrition during pregnancy with insufficient intake of folic acid, B vitamins and iron, leading to the development of anemia, as well as proteins are recognized as risk factors for CHD in children [24]. An epidemiological study of the prevalence of developmental malformations in the China region, characterized by a deficiency of zinc and an increased copper content in food, revealed a higher incidence of heart defects in the local population than in areas with a normal content of these trace elements [17].

In the Chinese province of Shanxi, characterized by a low consumption of green vegetables, fruits, meat, containing proteins, retinol, riboflavin, vitamin E, selenium (an average of 9-77% below recommended rates), the highest birth rates of children with CHD are observed. The average value of folic acid in the serum of women who gave birth to children with CHD was 9.6 nmol / L, which was significantly lower than the level of this vitamin in the blood of women with healthy children (14.03 nmol / L) [16].

A meta-analysis of the possible association between the socioeconomic status of the mother and the development of the CHD showed a negative relationship between the level of education, family income, maternal occupational exposure and increased risk of CHD: 11% (RR = 1.11); 5% (RR = 1.05) and 51% (RR = 1.51), respectively. It is concluded that the low level of maternal social and economic status has a moderate association with an increased risk of congenital anomalies in the circulatory system [23].

2. Medical and biological risk factors for congenital heart disease

Significant risk factors for the birth of children with congenital malformations include the pathological course of pregnancy, a burdened obstetric anamnesis, the features of the current pregnancy and childbirth.

Given that pregnancy is accompanied by a rebuilding of the mother's immune

and neuroendocrine systems, some authors explain the risk of developing congenital anomalies, including CHD, stimulation of cellular immunity with the production of antibodies to paternal antigens, the formation of progesterone-induced blocking factor (PIBF) inhibiting cytotoxic lymphocytes of the mother, which subsequently leads to damage to the trophoblast and an increase in the Th2-immune response. It was found that abnormalities in the ratio Th1 / Th2 lead to disturbances in the immunological relationships between the mother and fetus, intrauterine development of the fetus with the formation of congenital malformations and pathological births [19].

In some studies, the role of endotoxin of gram-negative bacteria in the intestine of the mother formed in increased amounts during hypoxia or intestinal pathology is indicated as a risk factor for intrauterine fetal development disorders and dysfunction of its organs [21].

Hypoxic conditions associated with the pathology of the circulatory system or anemic syndrome are also capable of leading to changes in the energy supply of fetal development processes, and may also exacerbate the adverse effects of other risk factors, such as smoking, infectious processes, hereditary factors [5].

In S.V. Medvedevastudy (2016), in the group of mothers who gave birth to children with CHD, the main risk factors were previous miscarriages and abortions (21.5%), infertility with appropriate treatment (4%), alcohol and smoking abuse during pregnancy (5.7% and 20.8%, respectively), stillbirths in the anamnesis (1.8%), somatic pathology, primarily anemia (48.8%), urinary tract disorders (27.7%), cardiovascular pathology (vegetative-vascular dystonia, arterial hypertension) - 17.4%, thyroid disease, obesity, diabetes (14.5%), pathology of the digestive system (7.1%), respiratory system (5.1%) . To the pathology of pregnant women, able to influence the development of CHD, chronic fetoplacental insufficiency (38%), toxicosis (22.2%), and the threat of abortion (32.6%) were attributed [8].

Numerous studies indicate a link between pregnant hypertension and congenital heart defects in their offspring. Thus, a systematic analysis with meta-analysis, including 16 clinical studies, demonstrated an increase in the relative risks of CHD in both the case of hypertension prone to treatment (RR = 2.0) and untreated hypertension

(RR = 1.8). This fact can be explained by the possible teratogenic effect of antihypertensive drugs [22].

A systematic review, conducted in 2015 on the example of 12 studies, indicates that pregnancy diabetes is a significant risk factor for CHD. At the same time, good glycemic control reduces this risk [18].

One of the reasons for the development of CHD by some authors is the presence of a persistent intracellular infection, which subsequently leads to a persistent decrease in the immune response [15]. Diagnosis of malformations in the antenatal period in this case is significantly hampered by the fact that intrauterine infection of the fetus in the vast majority of cases occurs in subclinical form or is asymptomatic [1].

Confirmation of these data is the results of N.P.Kotlukovastudy, who demonstrated that more than 97% of newborns with congenital cardiovascular pathology had a mixed viral infection, whereas in healthy newborns this indicator was 27.0% [7]. Similar results were obtained in another study, which showed that in newborns with complex CHD, class G immunoglobulins to the herpes simplex virus (HSV) and cytomegalovirus (CMV) were found in 96% and 38%, respectively [3].

A retrospective cohort study of the relationship between the presence of a viral infection (influenza, rubella, measles, chickenpox, hepatitis), as well as the use of antibiotics, tocolytics, anticonvulsants, antipyretics and analgesics, antitumor drugs, folic acid and contraceptives and the development of CHD for a period of 6 months before pregnancy and until the prenatal survey, 5381 newborns showed statistically significant differences in the cohort of children with CHD and a cohort of healthy children with regard to influenza infection, tocolytic drugs and contraceptives in the history of mothers [27].

In T.V. Osmirkostudy it was found that the relative risk of developing CHD in the presence of TORCH syndrome (toxoplasmosis in combination with other infections such as mycoplasmosis, chlamydia, listeriosis, rubella, cytomegalovirus infection, herpes) in newborn infants is 2.91 (0.64-12.26). At the same time, the overall detection rate of laboratory-confirmed cases of TORCH infections among newborns with clinical manifestations characteristic of intrauterine infection was 18.9% [6].

Proven teratogenic activity is typical for a fairly large number of drugs, which

include, in the first place, cytotoxic drugs, some antibiotics (aminoglycosides), mercury salts, some anticonvulsants, estrogens, valproic acid preparations, drugs for psoriasis.

The teratogenic effect of anticonvulsant drugs is caused by a deficiency of folic acid, necessary for the synthesis of nucleic acids in the fetus. Thus, a study by Japanese scientists showed that the intake of valproic acid during pregnancy increases the risk of developing CHD in newborns by a factor of 7 compared with other antiepileptic drugs [26]. In contrast, the intake of folic acid by pregnant women had a positive association with a decrease in the relative risk of developing CHD to 0.72 [23].

It is known that up to 75% of women suffer from candidal vulvovaginitis at least once in their life, especially during their reproductive years. Since about half of all pregnancies are unplanned, the risk of exposure to fluconazole during pregnancy is high. However, a systematic review of the relevant studies did not show a significant increase in the risk of congenital malformations as a whole when using fluconazole during the first trimester of pregnancy. The relative risk of developing CHD when taking the drug was 1.29, which requires further research in this direction [14].

In the literature, there are also data on the increased risk of CHD when using synthetic analogs of androgenic steroid hormones in the first trimester. Progesterone (medroxyprogesterone) has the same effect [20].

Thus, based on the literature data, it can be concluded that risk factors are of great importance in assessing and predicting the incidence of congenital heart disease.

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COURSE «VACCINE PROPHYLAXIS IN PEDIATRICS» IN THE EDUCATIONAL PROCESS OF STUDENTS OF A MEDICAL INSTITUTE

ABSTRACT

After 2016 at the medical universities of the country training of students takes place according to new educational standards. Training of students in medical schools until 2016 did not allow senior students to participate in the provision of medical care, and graduates - to work as doctors, as in the learning process too little attention was paid to practice. For the purpose of practical teaching methods in the educational process of training of students of medical Institute was developed and implemented a new course «Vaccinal prevention in Pediatrics». It is important to emphasize that shape the students' competencies should be focused on the semantic component of the leading types of medical activities. So, in the educational process constructed on the basis of the competence approach, a kind of dependency between knowledge and skills, subordination of the acquired knowledge and professional skills. This, in turn, contributes to the fact that education is for student personal and meaningful. We have developed a working program of discipline and teaching discipline to meet all required competencies. In accordance with the prepared and approved for publication guidelines and instructions for students. Particular attention was paid to organization of independent work of students, which is one of the most important components of the educational process and the condition for the development of competence of students. Independent work implied the use in the preparation of students to classes of situational tasks and tests designed for each lesson.

The test in the discipline included the control of acquired practical skills.

The introduction of new clinical disciplines promotes the acquisition of professional knowledge and skills.

Introduction

After 2016 at the medical universities of the country training of students takes place according to new educational standards. Training of students in medical schools until 2016 did not allow senior students to participate in the provision of medical care, and graduates - to work as doctors, as in the learning process too little attention was paid to practice. Therefore, according to the new standards in medical schools, starting from primary school, more time will be devoted to practical exercises.

The first graduation of specialists trained in the new standards is planned

in 2016-2017. Thus, from 2017 there will be no need in the internship as in the transitional stage of postgraduate training (diploma of graduation and the beginning of independent professional activity). Yesterday's students immediately after graduation will be able to work independently as a district therapist, a district pediatrician in outpatient clinics. However, to get the right to work, they will have to be accredited. It will differ from the current certification system in that it will become a system of admission to specific types of medical activities [1,2,3,4,5].

For the purpose of introduction of

practical methods of training in educational process of preparation of students of medical Institute the new course «Vaccinal prevention in Pediatrics» was developed and introduced. The working program of discipline and educational-methodical course of discipline taking into account performance of all necessary competences is developed.

The results of the implementation it is important to emphasize that the set of competencies formed by students should be focused on the semantic component of the leading types of medical activities. Thus, in the educational process, based