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COMORBID CONDITIONS IN CHILDREN WITH SEPTAL CONGENITAL HEART DEFECTS

Abstract. *Congenital heart defects are an important problem in pediatrics due to their high prevalence and the need for early surgical correction due to significant health problems and disability in children. According to WHO, congenital heart disease occurs in 0.7-1.7% of newborns. In some cases, the rapid progression of the stages of the course of congenital heart disease is determined not only by its severity, but also by the influence of concomitant diseases: hypoxic-ischemic encephalopathy, nutritional deficiencies, deficiency anemia, etc. Knowledge of the mechanisms of development of these disorders and the possibility of their timely detection with the help of modern research methods make it possible to diagnose and correct developing pathological conditions as early as possible. In this regard, the issue of studying clinical diagnostic criteria for improving the provision of timely medical care to children with congenital heart disease of an early age remains relevant and requires scientific research in this direction.*

Key words: *congenital heart disease, comorbid conditions, neuropsychiatric disorders, allergies, developmental delay.*

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СЕПТАЛ ТУҒМА ЮРАК НУҚСОНИ БЎЛГАН БОЛАЛАРДА КОМОРБИД ҲОЛАТЛАР

Изоҳ. *Туғма юрак нуқсонлари бўлган болалар соғлиғида жиддий муаммоларга ва ногиронликка олиб келиши, уларнинг кенг тарқалганлиги ва эрта жарроҳлик коррекцияси талаб қилиши туфайли педиатрияда муҳим муаммо ҳисобланади. ЖССТ маълумотларига кўра, туғма юрак нуқсони янги туғилган чақалоқларнинг 0,7-1,7% да учрайди. Баъзи ҳолларда туғма юрак нуқсонлари кечишининг босқичлари тез ривожланиши нафақат унинг оғирлик даражаси, балки коморбид ҳолатларнинг таъсири билан ҳам белгиланади, жумладан гипоксик-ишемик энцефалопатия, озиқланиш етишмовчилиги, дефицит анемиялар ва бошқалар. Ушбу бузилишларнинг ривожланиш механизмларини билиш ва уларни замонавий тадқиқот усуллари ёрдамида ўз вақтида аниқлаш имконияти ривожланаётган патологик ҳолатларни имкон қадар эрта ташҳислаш ва коррекциялаш имконини беради. Шу муносабат билан туғма юрак нуқсони бўлган эрта ёшдаги болаларга ўз вақтида тиббий ёрдам кўрсатишни такомиллаштиришнинг клиник диагностика мезонларини ўрганиш масаласи долзарблигича қолмоқда ва бу йўналишда илмий изланишларни тақозо этади.*

Калит сўзлар: *юрак туғма нуқсони, коморбид ҳолатлар, психоневрологик бузилишлар, аллергия, ривожланишдан орқада қолиш.*

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КОМОРБИДНЫЕ СОСТОЯНИЯ У ДЕТЕЙ С СЕПТАЛЬНЫМИ ВРОЖДЕННЫМИ ПОРОКАМИ СЕРДЦА

Аннотация. *Врожденные пороки сердца являются важной проблемой педиатрии вследствие их высокой распространенности и необходимости ранней хирургической коррекции в связи с значительными нарушениями здоровья и ограничением жизнедеятельности детей. По данным ВОЗ, врожденный порок сердца (ВПС) встречается у 0,7-1,7% новорождённых детей. В некоторых случаях, быстрое прогрессирование стадий течения врождённого порока сердца определяется не только его тяжестью, но также влиянием коморбидных состояний: гипоксически-ишемической энцефалопатии, дефицит питания, дефицитной анемии и др. Знание механизмов развития этих нарушений и возможность своевременного их выявления при помощи современных методов исследования позволяют наиболее рано диагностировать и корригировать развивающиеся патологические состояния. В связи с этим, вопрос изучения клинико-диагностических критериев улучшения оказания своевременной медицинской помощи детям с врождённым пороком сердца раннего возраста остается актуальным и требует научных исследований в данном направлении.*

Ключевые слова: *врожденный порок сердца, коморбидные состояния, психоневрологические расстройства, аллергия, отставание в развитии.*

Introduction. Congenital heart defects (CHD) are an important problem in pediatrics due to their high prevalence and the need for early surgical corrections as such defects may cause severe health problems and disability. According to the World Health Organization (WHO), congenital CHD occurs in 0.7-1.7% of newborns [3,7,8].

In Uzbekistan, birth prevalence of CHD ranges from 5.5 to 15.7 per 1000 live births [4,5].

CHD associated with any comorbid disease can complicate treatment outcome. CHD correction is not the only problem in patients with CHD. These patients often have concomitant pathology, both cardiac (rhythm disturbances, valvular insufficiency and valvular endocarditis, impaired contractility) and non- cardiac (the most common are genetic syndromes and anomalies of the central nervous system) [2,6,9,10].

In some cases, rapid progression of CHD course stages is determined not only by CHD severity, but also the influence of concomitant diseases: hypoxic-ischemic encephalopathy, nutritional deficiencies, deficiency anemia, etc. Knowing mechanisms of these disorders development and having opportunities for their timely detection with the help of modern research methods make it possible to diagnose and correct developing pathological conditions as early as possible. At the same time, it is not excluded that a severe course of heart defects, cardiac disorders can contribute to the development of intercurrent pathology. This is due primarily to the immune system dysfunction of a transient nature, secondary changes in factors of humoral or cellular immunity [1,12].

Thus, identifying and treating comorbidities before prescribing specific treatment is vitally important for achieving best results.

Children with CHD are at risk of growth and developmental delay. Comorbid conditions can complicate the course and treatment of cardiovascular diseases, contribute to the progression of the disease, and change treatment response. As a result, it is advisable to estimate the proportion of cardiac children with comorbidities.

Materials and methods. There was conducted a medical examination of 103 children (from 1 month to 36 months, average age was 12.7 ± 0.48 months) with septal congenital heart diseases, who underwent hospital treatment in the Department of Cardiac Surgery at the Regional Children's Multidisciplinary Medical Center (DSRChMMC) in Samarkand during the period from 2021 to 2022, and who were divided into III groups:

- Group I consisted of 72 children operated on (the main group) with congenital septal heart defects.

- Group II consisted of 31 children (the comparison group) who received only conservative treatment, due to contra-indications to surgery.

And also, group III consisted of 32 healthy children for the control study.

To achieve this object, a set of studies was carried out, including clinical and instrumental data, as well as ultrasonography (USG) - echocardiography (EchoCG) together with Doppler ultrasound, in order to assess the anatomical structure and functions of the heart and large vessels using the Vivid S 60 N according to standard methods. In addition to echocardiography, all children underwent electrocardiography (ECG), chest x-ray, and laboratory tests. Besides, additional research methods were carried out as the way of measuring anthropometric parameters: a numeric value of an individual’s weight and height by calculating Quetelet index.

Screening test for psychoneurological development of children DENVER II was used to determine cognitive impairment and evaluate psychomotor development.

Parent-reported data on allergic reactions to drugs, foods, and plant pollen were collected.

Results. In the Department of Pediatric Cardiac Surgery of the Samarkand Regional Children's Multidisciplinary Hospital, over the past 5 years, in the period from 2018 to 2022, 1332 patients were operated on, with 745 (55.93%) of which had septal CHD, i.e. approximately every second child.

Within 5 years, the number of patients admitted to the Department of Cardiac Surgery of the Samarkand was progressing (Fig. 1)

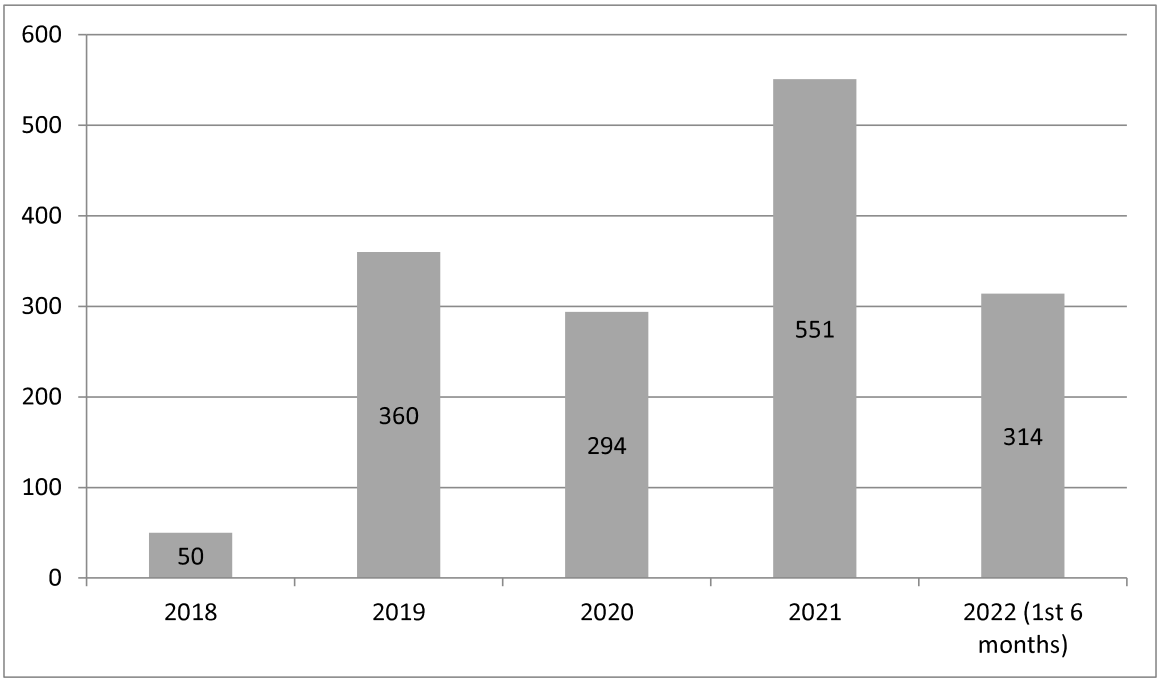


Fig. 1 **The number of patients admitted to the Department of Cardiac Surgery of the Samarkand ODMMC in the period 2018-2022.**

A significant increase in the number of operated patients with CHD during the period 2018-2022 is noted, that is, from year to year the number of operated patients almost doubled (Fig. 2).

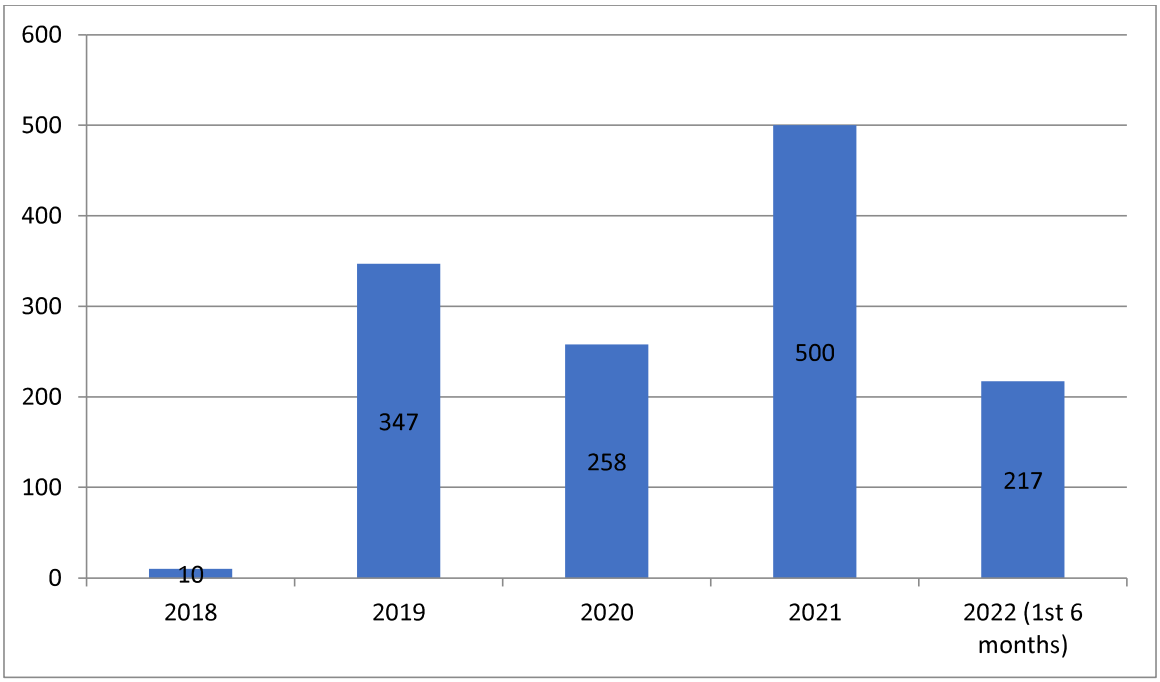


Fig. 2 **The number of operated patients with CHD in the period 2018-2022**

It should be noted that during the survey period there was a trend towards an increase in CHD in children in all regions.

According to the references, the ratio of patients depending on gender is different. According to the results of our research, girls numerically predominate over boys. Among the examined children there were 48 boys (46.60%) and 55 girls (53.39%).

The height and weight of 103 children with CHD, aged from 1 month to 3 years, and 31 healthy children, aged from 1 month to 3 years, were compared with standard growth curves. Differences in the development of personal and social skills, fine

motor skills and adaptability, speech and gross motor skills were assessed.

Growth parameters, including weight, height, body mass index (BMI by Quetelet) was measured.

BMI values in the group of children who received only conservative treatment were significantly lower than in the group of operated children and the control group (BMI P < 0.01). A significant difference was found in both height (P<0.05) and weight (P<0.05) between the two groups. Most children with congenital heart disease were below the 50th percentile for height (P<0.05) and weight (P<0.001).

At the analysis of the anthropometric values of children with congenital septal heart defects, it was revealed that only one fourth of the patients (25.4%) had an average degree of physical development, while the majority of children (74.6%) had various deviations. Thus, low physical development was typical for more than a third of children (37.2%), a small percentage of children (6.7%) was rated as above average. Among breastfed children, children with average and below average levels of physical development prevailed. Most of the children on artificial and mixed feeding had a low level of physical development.

The screening test for psychoneurological development of children DENVER II is based on the assessment of gross motor skills, speech development, fine motor-adaptive activity and individual social development. According to these parameters, children were assessed as having normal development (NR), psychomotor developmental delay (MPMR), psychoverbal developmental delay (SPRR).

Children of the main group had the following neurological disorders: psycho-neurological development lagging behind the age norm: MPMR - 63.8% (n = 46), ZPRR - 36.2% (n = 26); convulsive syndrome - 5.56% (n = 4); minimal brain dysfunction (MMD) – 23.4% (n =19).

All children of the main group in the pre- and post-operative period received within 1-month combination therapy Cortexin at a dose of 0.5 mg/kg, as well as Lecip Forte syrup.

3 months after the surgery, during the second study, children of the main group showed a decrease in the degree of psychoneurological development disorders, according to the repeated test DENVER II: MPMR - 30.5% (n = 22), ZPRR - 12.5% (n = 9); convulsive syndrome - 1.38% (n = 1); minimal brain dysfunction (MMD) - 2.78% (n = 2).

n the structure of deviations in psychoneurological development along various lines of development, a lag in the development of active speech, actions with objects, and skills prevailed.

It should be noted that at the preoperative stage of the surgery, children with CHD were significantly more likely to have deviations and belong to developmental groups with a lag. The lag most often manifested itself in a delay in the development of active speech, general movements, that is, gross motor skills, fine motor-adaptive activity, and sensory skills.

Within the study of the prevalence of allergic diseases (AD) among children with congenital heart disease in the districts of Samarkand and regions of the Republic of Uzbekistan, in terms of accessibility and hospitalization in the pediatric cardiosurgical departments, a trend was identified in the following order: Urgut district *8,73%* (n=9), *Ishtikhan district 6,79%* (n=7), Kushrabad region *2,91%* (n=3) and in Jizzakh region *0,97%* (n =1).

Children from the main group and the comparison group had an allergic reaction to drugs such as azithromycin, chikoncil; baby formula; foods: berries (raspberries, strawberries), citrus fruit (tangerines, oranges), sweets (chocolate), plants. Also, some parents found it difficult to define what could cause their children's allergic reaction.

An allergic reaction to all allergens mentioned above manifested itself in the form of skin rash: scaly spots (weeping or dry), problems with digestion (flatulence, abdominal pain, frequent regurgitation, loose stools or constipation), and shortness of breath from the respiratory system.

The prevalence of AD in children with CHD was 19,41%.

Other congenital or genetic comorbidities occurred in 11,7%.

Summarizing the group comparison data, it can be concluded that in order to identify the factors which the structure of comorbid pathology could depend on and which could be used to predict such pathology, it is necessary to conduct a more in-depth study of genetic factors, anamnesis, somatic status and paraclinical data.

Conclusions. 1. Lag in physical development, delayed psychomotor and psychoverbal development were the most common comorbid conditions among children with septal CHD.

2. Among the genetic concomitant diseases, Down syndrome prevailed.

3. A significant proportion of children with CHD have concomitant non-cardiac diseases. Close collaboration between pediatric cardiologists and pediatricians of other subspecialties is essential in order to optimize care of these children.

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