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NEUROCOGNITIVE DYSFUNCTION DISORDERS IN CHILDREN WITH CONGENITAL HEART DEFECTS

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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, neurocognitive disorders, behavioral problems, externalizing behavior, internalizing behavior

TUG'MA YURAK NUQSONI BO'LGAN BOLALARDA NEYROKOGNITIV DISFUNKSIYALAR

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Annotatsiya: Tug‘ma yurak nuqsonlari bolalar sog‘lig‘ida jiddiy muammolarga va nogironlikka olib kelishi, ularning keng tarqalganligi va erta jarrohlik korreksiyasi talab qilishi tufayli pediatriyada muhim muammo hisoblanadi. jsst ma’lumotlariga ko‘ra, tug‘ma yurak nuqsoni yangi tug‘ilgan chaqaloqlarning 0,7-1,7% da uchraydi. Ba'zi hollarda tug‘ma yurak nuqsonlari kechishining bosqichlari tez rivojlanishi nafaqat uning og‘irlik darajasi, balki komorbid holatlarning ta'siri bilan ham belgilanadi, jumladan gipoksik-ishemik ensefalopatiya, oziqlanish yetishmovchiligi, defisit anemiyalar va boshqalar. Ushbu buzilishlarning rivojlanish mexanizmlarini bilish va ularni zamonaviy tadqiqot usullari yordamida o‘z vaqtida aniqlash imkoniyati rivojlanayotgan patologik holatlarni imkon qadar erta tashxislash va korreksiyalash imkonini beradi. Shu munosabat bilan tug‘ma yurak nuqsoni bo‘lgan erta yoshdagi bolalarga o‘z vaqtida tibbiy yordam ko‘rsatishni takomillashtirishning klinik diagnostika mezonlarini o‘rganish masalasi dolzarbligicha qolmoqda va bu yo‘nalishda ilmiy izlanishlarni taqozo etadi.
Kalit so‘zlar: Tug‘ma yurak nuqsoni, neyrokognitiv buzilishlar, xulq-atvor muammolari, tashqi xatti-harakatlar, xatti-harakatni ichkilashtirish

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НЕЙРОКОГНИТИВНЫЕ ДИСФУНКЦИИ У ДЕТЕЙ С ВРОЖДЁННЫМИ ПОРОКАМИ СЕРДЦА

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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: врождённый порок сердца, нейрокогнитивные расстройства, поведенческие проблемы, экстернализирующее поведение, интернализирующее поведение

Congenital heart defects are an important pediatric problem due to their high prevalence and the need for early surgical correction due to significant disability and impairment in children.
As more children survive with CHD, managing their behavioral problems becomes increasingly important. Children with CHD have more behavioral problems compared to children without chronic conditions.
With CHD, there may be low oxygen levels and/or abnormal blood flow to the brain. Heart surgery, catheterization, and anesthesia required to repair the heart defect affect brain function. Children born with genetic syndromes have a significantly higher risk of cognitive impairment. Interactions between pathogens and brain cells are also important in brain development.
Licht and colleagues in their study found that the brains of full-term infants with CHD were smaller than the brains of children without CHD born within 35 weeks. This is two-thirds of the size that should be at 40 weeks. This means that children born with CHD are delayed in brain development by about a month and thus are delayed from the very beginning of life.
Marino et al in their studies found that children with more pronounced CHD detection have more severe cognitive impairment.
The American Academy of Pediatrics specifies factors that increase an individual's risk of developing a child with CHD. Heart surgery in children with cyanotic heart disorders, heart surgery as a newborn or infancy, and children with CHD and co-morbidities such as prematurity and prolonged hospitalization have been shown to place them at higher risk.

Children with CHD may develop cognitive impairment. This includes a shorter attention span, impulsivity, and trouble paying attention. Executive function may also be impaired. These are the skills that allow us to keep track of time, make plans, apply previously learned information to solve other problems, analyze ideas, and ask for help when we need it.

Behavioral problems in children can be divided into externalizing behaviors and internalizing behaviors. Externalizing behaviors are characterized by defiance, impulsivity, hyperactivity, destructiveness, aggression, and antisocial traits. Internalizing behaviors include withdrawal, dysphoria, and anxiety. Boys with CHD have more externalizing problems than girls. Preoperative hypoxia and peri- and postoperative cardiovascular insufficiency may lead to internalizing and externalizing behavioral problems in the future. Children who have had open heart surgery at a very early age are prone to develop attention deficit hyperactivity disorder when they reach school age. A comprehensive approach in this area is important to plan effective early interventions and recommendations.

Children with chronic somatic diseases are vulnerable to behavioral problems. Research has revealed more behavioral problems in children with CHD. Behavioral disorders in children can be divided into externalizing behavior and internalizing behavior. Externalizing behavior is characterized by disobedience, impulsivity, hyperactivity, destructiveness, aggression and antisocial traits. Internalizing behavior is characterized by withdrawal, dysphoria and anxiety. According to Rudnikovich T.V. (2012), 179 children and adolescents with congenital heart defects were examined, neuropsychiatric disorders of various levels were diagnosed in 135 (75.4%) children and adolescents, which significantly exceeds the prevalence rates in the population. Neuropsychiatric disorders were diagnosed most often (60.9% - 109 people), followed by mental retardation (8.4% - 15 people). Pre-clinical level disorders were diagnosed in 6.1% of patients (n=11) in the form of manifestations of minimal brain dysfunction and neurotic reactions. Among borderline neuropsychiatric disorders, cognitive impairment was diagnosed most frequently (24.1% - 43 people). The second most frequently detected disorder was behavioral and emotional disorders of childhood, most often represented by attention deficit hyperactivity disorder (17.3% - 31 people). Speech and motor development disorders, as well as organic asthenic and cognitive disorders (8.9% - 16 people) were observed somewhat less frequently (10.6% - 19 people). The identified neuropsychiatric disorders were significantly more common in boys than in girls (83.3% and 63.8%, respectively, $p<0.01$), which confirms the literature data on the greater vulnerability of males to pathogenic effects.

Studies have shown that children with CHD have more behavioral and emotional problems compared to children from the general population. Regardless of the severity of heart disease, patients with CHD had more behavioral problems.

Kramer et al. from the Department of Pediatric Cardiology, University of Düsseldorf, Germany, compared 128 children with CHD and 89 healthy controls and found that the cardiac patients had increased feelings of inferiority and anxiety, as well as behavioral problems.

In a study conducted at the Children's Clinic, University Hospital, Oslo, Norway, et al. reported that children with CHD had significantly more behavioral problems than the control population, and boys scored higher than girls.

Fredriksen P.M. et al also found that boys scored significantly higher than girls on the total and externalizing problems scores, with more social problems, attention problems, delinquent behavior, and aggressive behavior. No gender differences were found for the internalizing problems score. No effect was found for different diagnoses. Yan et al studied the neuropsychological and behavioral status of thirty-nine Chinese children with acyanotic congenital heart disease in the age group of five to fourteen years. They found more severe behavioral impairments in children with acyanotic congenital heart disease compared to controls matched for age, education level, and social class.

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