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M.A. NURMUKHAMEDOVA
Tashkent Pediatrical Medical Institute
Department of "Neurology, Pediatric Neurology and Medical Genetics"

CHARACTERISTICS OF SEIZURES IN CHILDREN WITH CONGENITAL HEART DISEASES

Examined a total number of 45 patients from 1 to 10 years with congenital heart disease of different forms. We were studied the neurological status of patients and identified syndromes prevalent disorders of the nervous system. The distinctive characteristics of seizures was established on the clinical and functional status. It was concluded that the children with congenital heart disease are prone to have a seizures, severity and type of seizure depends on the type of congenital heart disease and age of patients.
***Keywords**: congenital heart disease, cognitive function, autonomic nervous system, convulsive disorders.*

The frequency of congenital heart disease is high enough. Different authors estimate the frequency of occurrence varies, but on average it is 0.8-1.2% in all newborns. Of all the encountered malformations, they make up 30%. [1,2]
Damage to the nervous system from congenital heart defects represent a new and little-known chapter of clinical neurology. As congenital heart disease have became more often surgically treated, and complications of the nervous system after operations have gained not only of academic interest but also of practical importance.
Seizures in congenital heart disease (CHD) are one of the most important syndromes that require detailed analysis. Severity of the clinical manifestation of seizures are due to the depth of cardiovascular disorders, cerebrovascular insufficiency, as well as the individual characteristics of the organism and its "seizure activity." Seizures often occur in cyanotic crises, arising spontaneously or with little physical exertion. Seizures are usually caused by anoxia and generally not accompanied by signs of focal brain lesions.
If an addition patients with seizures exhibit the phenomenon of focal lesions of the central nervous system, seizures might be caused by effect of expansion of the cerebral venous thrombosis, old scars and other arterial or venous thrombosis.
The study of these aspects can help neurologists, cardiac surgeons, anesthesiologists for choosing anesthesia, treatment strategy for the operational period and for rehabilitation period.
The aim of our study was to investigate the features of clinic, diagnosis and course of seizures, the way of emergency care for children with congenital heart disease.
Materials and methods. The analysis of the survey data of 45 children with congenital heart disease between the ages of 1 to 10 years. All clinical material is divided into three age groups (1-3 years, 4-7 years, 8-10 years). Of these, 19 (42%) were girls and 26 (58%) were boys. Performed clinical and neurological examination, and functional state of the brain was assessed by electroencephalography. All sick children were divided on the nature of the disease into 4 groups.

Table 1 - Distribution of children according clinical types of CHD

Clinical types of CHD	**1-3 ages**	**4-7ages**	**8-10ages**	**Gender of children**	
				Boys	**Girls**
Tetralogy of Fallot	4(18%)	3(21%)	2(22%)	5(23,7%)	4(17,3%)
VSD	6(27%)	4(29%)	5(56%)	6(27,2%)	9(39,1%)
ASD	7(32%)	6(43%)	2(22%)	8(36,3%)	7(30,4%)
TGA	5(23%)	1(7%)	-	3(13,6%)	3(13%)
Total	22(49%)	14(31%)	9(20%)	22(48,8%)	23(51,1%)

Note. In parentheses is %; VSD, ventricular septal defect; ASD - atrial septal defect; TGA - transposition of the great arteries.

The most common defect is a VSD (ventricular septal defect) - 15 children. Next in frequency ASD (atrial septal defect) - 11 children. 9 children presented with defects in the form of tetralogy of Fallot and transposition of the great arteries. In the aspect of age the largest group consisted of children aged 1 to 3 years, which accounted for 49% (22 children) of all clinical material. The smallest group was aged 8-10 years. (9 children)
Results and discussion. The mothers of children was burdened obstetrical history (asphyxia) in 48% of cases, acute respiratory viral infection in the first half of pregnancy in 86%, inflammatory kidney disease in 72% of cases, as well as in 100% of the observed anemia and toxemia.
In neurological studies in all groups were observed microsigns of lesions of the central nervous system at different levels. For example disturbance of convergence of the eyes was observed in 19 patients, weak abductor muscles of the eye was observed in 21 patients, equal recovery of tendon and periosteal reflexes in 40 patients and this was associated with chronic cerebral vascular insufficiency and hypoxemia.

Table 2 - The incidence of clinical types of seizures in children with CHD

Clinical type of seizure	Age of children			Total seizures
	1-3 age	4-7 age	8-10 age	
Number of children	22(49%)	14(31%)	9(20%)	45(100%)
Generalized	14(64%)	10(71%)	3(33%)	27(60%)
Partial	8(36%)	4(29%)	6(67%)	18(40%)

Note. In parentheses is %

The first group consisted of 22 patients (49%) aged from1 to 3 years with various heart diseases accompanied by convulsive syndrome. Tonic seizures were observed in 10 cases (45.4%), propulsive seizures in 3 cases (13.6%), myoclonic seizures in 6 cases (27.2%), clonic seizures in 3 (13.6%) patients. In the EEG (electroencephalographical) of 15 (68.1%) children the center of epiactivity was in the brain stem with background brain changes, in the type of reduction of brain activity. In 7 children (31.8%) with myoclonic seizures was observed EEG pathological focus of seizure activity in all leads, on background brain changes with a predominance activity of Δ-slow-wave

The second group consist of 14 children aged 4- 7 years with heart defects and convulsive syndrome. In 8 (57.1%) patients were observed generalized tonic seizures; in EEG recorded mild dysfunction in brainstem structures, the focus of pathological activity is not defined. Propulsive seizures was recorded in 4 children (28.5%), EEG epiactivity focus defined in brainstem structures with background gross type of brain changes which reduce the bioelectric activity of the GM hemispheric asymmetry D> S. In 2 (14.2%) patients had clonic seizures, EEG seizure activity was recorded in subcortical structures, slow-wave activity was in the occipital regions of the brain.
The third group consisted of 9 (24%) children aged from 8 to 10 years old with seizures. Tonic convulsions were observed in 5 (56%) patients, EEG recorded dysfunction in mid-stem structures of the brain, with clonic seizures observed in 4 (44%) children on EEG seizure activity recorded in subcortical structures and the slow-wave activity in the occipital brain regions .
Basic treatment principles of seizures were aimed to relief seizures. The drug of choice depended on the type of seizure. Preference was given to the drug which increases the content of GABA in the CNS (valproic acid).
Valproic acid and its salts possess a broad spectrum of action and can be administered at essentially all forms of seizure as a first line drug of choice.
In addition to effective suppression of seizures, valproate is characterized by a pronounced positive effect on the mental, emotional, cognitive functions and social functioning due to feeling better and because of the absence of seizures along with suppression of epileptic and subclinical discharges which disintegrate the brain function.
Thus, usage of drugs from valproate group for treatment of seizures correlate with good effect of clinical and neurophysiological parameters. After reaching a stable clinical effect in relieving seizures in these children, we raise the issue of mandatory surgical correction of heart disease with background support with anticonvulsant therapy.
Conclusions:
1. Children with congenital heart disease are at risk of developing seizures.
2. The severity and type of seizures depend on the type of CHD and age of the patients.
3. Management of patients with convulsive syndrome in CHD should take into account the nature of seizures, their frequency, as well as the results of EEG studies.

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М.А. НУРМУХАМЕДОВА
Ташкент педиатриялық медицина институты
Кафедра «Неврология, балалар неврологиясы және медициналық генетика»

БАЛАЛАРДАҒЫ ТУА БІТКЕН ЖҮРЕК АҚАУЛАРЫ КЕЗІНДЕГІ ТЫРЫСУ СИНДРОМЫ АҒЫМЫНЫҢ ЕРЕКШЕЛІКТЕРІ

Түйін: 1 және 10 жас аралығындағы әр түрлі туа біткен жүрек ақауларымен 45 бала тексерілген. Балалардың неврологиялық статусы зерттелген және жүйке жүйесі зақымдануының аса айқын синдромдары анықталған. Клиникалық және функциональды жағдайы бойынша тырысу синдромы ағымының ерекшеліктері анықталған. Қорытындылай келе, туа біткен жүрек ақауы бар балалар тырысу синдромына бейім келеді және тырысу түрі жүрек ақауының түрі мен қатар баланың жасына байланысты болады.

Түйінді сөздер: туа біткен жүрек ақаулары, когнитивті қызметтер, вегетативті жүйке жүйесі, тырысу синдромы.

М.А. НУРМУХАМЕДОВА
Ташкентский педиатрический медицинский институт
Кафедра «Неврологии, детской неврологии и медицинской генетики»

ОСОБЕННОСТИ ТЕЧЕНИЯ СУДОРОЖНЫХ СИНДРОМОВ ПРИ ВРОЖДЕННЫХ ПОРОКАХ СЕРДЦА У ДЕТЕЙ

Резюме: Обследовано 45 больных от 1 до 10 лет с врожденными пороками сердца различной формой. Изучен неврологический статус больных и определены превалирующие синдромы нарушения нервной системы. Установлено отличительные особенности течения судорожных синдромов по клиническому и функциональному состоянию. Были сделаны выводы, что больные дети с врожденными пороками сердца склонны к судорожным синдромам и степень тяжести и вид судорог зависит от вида врожденных пороков сердца и возраста больных.

Ключевые слова: врожденные пороки сердца, когнитивные функции, вегетативная нервная система, судорожные синдромы.