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ASSESSMENT OF MENTAL AND MOTOR DEVELOPMENT BY DENVER SCREENING TESTING AFTER TREATMENT IN CHILDREN WITH CONGENITAL HEART DEFECTS

Tairova Sakina Baxodirovna, Usmanova Kamilla Bakhtierovna, Bakhodirova Shakhzoda Khusenovna, Nigmatova Sevinch Sukhrobovna
Samarkand State Medical University

SUMMARY: Congenital heart defects (CHD) are a serious problem in pediatrics due to their high prevalence and the need for early surgical correction due to serious health problems and disabilities of the child. The social significance of the problem is determined by the fact that among congenital developmental anomalies leading to disability, congenital heart defects account for about 50%. According to the World Health Organization, congenital heart defects occur in 0,7-1,7% of newborns. In Uzbekistan, from 5 to 15 newborns out of 1000 live births are born with congenital heart defects. Currently, given the increasing incidence of congenital septal heart defects, pathogenetic mechanisms, features of the clinical course, the occurrence of severe complications of the disease, the appointment of diagnostic and therapeutic procedures is a problem that needs to be solved in pediatrics.
Key words: congenital heart defect, mental development, motor development, Denver screening testing, hypoxic changes in the brain.

ОЦЕНКА РАЗВИТИЯ ПСИХИЧЕСКОГО И МОТОРНОГО РАЗВИТИЯ ПО ДЕНВЕРСКОМУ СКРИНИНГ ТЕСТИРОВАНИЮ ПОСЛЕ ЛЕЧЕНИЯ У ДЕТЕЙ С ВРОЖДЕННЫМИ ПОРОКАМИ СЕРДЦА

РЕЗЮМЕ: Врожденные пороки сердца (ВПС) являются серьезной проблемой в педиатрии, вследствие высокой распространенности и необходимости ранней хирургической коррекции из-за серьезных нарушений здоровья и инвалидности ребенка. Социальная значимость проблемы определяется тем фактом, что среди врожденных аномалий развития, приводящих к инвалидности, врожденные пороки сердца составляют около 50%. Согласно сведениям, Всемирной организации здравоохранения врожденные пороки сердца встречаются у 0,7-1,7% новорожденных. В Узбекистане от 5 до 15 новорожденных на 1000 родившихся живыми рождаются с врожденными пороками сердца. В настоящее время, учитывая возрастающую заболеваемость врожденными септальными пороками сердца, патогенетические механизмы, особенности клинического течения, возникновение тяжелых осложнений заболевания, назначение диагностических и лечебных процедур является проблемой, решение которой необходимо в педиатрии.
Ключевые слова: врожденный порок сердца, психическое развитие, моторное развитие, Денверский скрининг тестирование, гипоксические изменения мозга.

TUG‘MA YURAK NUQSONLARI BO‘LGAN BOLALARDA DENVER SKRINING TESTI YORDAMIDA DAVOLASHDAN KEYINGI NUTQ RIVOJLANISHI VA MOTORIKA FUNKSIYASINI BAHOLASH

AMERICAN ACADEMIC PUBLISHER

INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

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ANNOTATSIYA: Tug‘ma yurak nuqsonlari (TYuN) pediatriyada jiddiy muammo hisoblanadi, chunki ularning keng tarqalganligi va bolada sog‘liqning og‘ir buzilishlari hamda nogironlikka olib keluvchi holatlar sababli erta jarrohlik yo‘li bilan tuzatishni talab qiladi. Ushbu muammoning ijtimoiy ahamiyati shundaki, nogironlikka olib keluvchi tug‘ma rivojlanish nuqsonlari orasida yurakning tug‘ma nuqsonlari taxminan 50 foizni tashkil qiladi. Jahon sog‘liqni saqlash tashkiloti ma’lumotlariga ko‘ra, tug‘ma yurak nuqsonlari har 1000 tirik tug‘ilgan chaqaloqdan 7–17 tasida (0,7–1,7%) uchraydi. O‘zbekistonda esa bu ko‘rsatkich har 1000 tirik tug‘ilgan chaqaloqdan 5 tadan 15 tagacha tug‘ma yurak nuqsonlari bilan tug‘ilishi bilan ifodalanadi. Hozirgi vaqtda tug‘ma septal yurak nuqsonlarining ortib borayotgan darajasi, ularning patogenetik mexanizmlari, klinik kechishining o‘ziga xosligi, kasallikning og‘ir asoratlari, diagnostik va davolash usullarini belgilash pediatriyada hal qilinishi lozim bo‘lgan muammo bo‘lib qolmoqda.

Kalit so‘zlar: tug‘ma yurak nuqsoni, nutq rivojlanishi, motorika funksiyasi, Denver skrining testi,miyadagi gipoksik o‘zgarishlar.

Research Objective. To optimize methods for the early diagnosis of comorbid conditions in children with septal congenital heart defects.

Materials and Methods. The study was conducted in 2021–2022 at the Department of Cardiac Surgery of the Samarkand Regional Multidisciplinary Children's Medical Center. Clinical and laboratory-instrumental examinations were performed. The study included 108 children aged from 1 month to 3 years with septal congenital heart defects (CHD), as well as 30 conditionally healthy infants. All participants underwent general clinical examinations, immunological tests, echocardiography (EchoCG), electrocardiography (ECG), neurosonography (NSG), electroencephalography (EEG), the Denver screening test, and chest X-ray (as indicated).

During the study, all 138 children were divided into three groups: Group I (main group) included 73 children (67.6%) with septal CHD who underwent surgery after correction of comorbid conditions; Group II (comparison group) consisted of 35 children (32.4%) who underwent surgery without correction of comorbidities; Control group included 30 conditionally healthy infants, matched by age and sex, who were under observation at Family Polyclinic No. 4 in Samarkand.

Inclusion criteria for the control group: **a**ge from 1 month to 3 years; first health group (clinically healthy); no acute illnesses in the past month.

Results. Central nervous system (CNS) pathology was detected in all 108 (100%) children with septal congenital heart defects (CHD). To correct CNS disorders in the children of Group I (main group), cases identified by the Denver screening test and later confirmed by instrumental methods were treated with a combined therapy method including standard therapy plus a complex of polypeptide fractions as an antioxidant and neuroprotector.

The polypeptide fraction complex was administered intramuscularly at a dose of 5 mg once daily for a treatment course of 10 days.

One month after surgery and administration of the polypeptide fraction complex in all children with septal CHD, their psychomotor development was assessed based on the Denver screening test (Table 1). In Group I: for children under 1 year, individual-social development was classified as “normal” in 63.6% and “suspicious” in 22.7%. At 1–2 years: “normal” – 41.4%, “suspicious” – 55.1%. At 2–3 years: “normal” – 63.4%, “suspicious” – 27.3%. Fine motor skills and adaptation: under 1 year: “normal” – 68.2%, “suspicious” – 27.3%; 1–2 years: “normal” – 58.6%, “suspicious” – 37.9%; 2–3 years: “normal” – 68.2%, “suspicious” – 22.8%.

AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES
ISSN NUMBER: 2692 - 5206 Volume 5,September ,2025

Speech development: under 1 year: “normal” – 45.4%, “suspicious” – 45.4%; 1–2 years: “normal” – 31.1%, “suspicious” – 58.6%; 2–3 years: “normal” – 54.5%, “suspicious” – 50%. Gross motor skills: under 1 year: “normal” – 45.4%, “suspicious” – 50%; 1–2 years: “normal” – 31.1%, “suspicious” – 65.4%; 2–3 years: “normal” – 54.5%, “suspicious” – 45.5%.

Table 1
Assessment of psychomotor development Based on the Denver screening test after treatment

from 1 month to 12 months					
Group		individual-social development	fine motor skills and adaptation	speech development	gross motor skills
Group I (main group) (n=22)	A B C	5 (22,7) 14 (63,6) 3 (13,7)	6 (27,3) 15 (68,2) 1 (4,5)	10 (45,4) 10 (45,4) 2 (9,2)	11 (50,0) 10 (45,4) 1 (4,6)
Group II (comparison group) (n=14)	A B C	4 (28,6) 9 (64,2) 1 (7,2)	5 (35,7) 7 (50,1) 2 (14,2)	4 (28,6) 9 (64,2) 1 (7,2)	6 (42,7) 7 (50,1) 1 (7,2)
from 1 year to 2 years					
		individual-social development	fine motor skills and adaptation	speech development	gross motor skills
Group I (main group) (n=29)	A B C	16 (55,1) 12 (41,4) 1 (3,5)	11 (37,9) 17 (58,6) 1 (3,5)	17 (58,6) 9 (31,1) 3 (10,3)	19 (65,4) 9 (31,1) 1 (3,5)
Group II (comparison group) (n=10)	A B C	2 (20,0) 7 (70,0) 1 (10,0)	5 (50,0) 5 (50,0) 0 (0)	4 (40,0) 6 (60,0) 1 (10,0)	4 (40,0) 5 (50,0) 1 (10,0)
from 2 years to 3 years					
		individual-social development	fine motor skills and adaptation	speech development	gross motor skills
Group I (main group) (n=22)	A B C	6 (27,3) 14 (63,4) 2 (9,0)	5 (22,8) 15 (68,2) 2 (9,0)	11 (50) 10 (45,5) 1 (4,5)	10 (45,5) 12 (54,5) 0 (0)
Group II (comparison group) (n=11)	A B C	3 (27,2) 6 (54,6) 2 (18,2)	3 (27,2) 5 (45,6) 3 (27,2)	2 (18,2) 9 (81,8) 0 (0)	2 (18,2) 8 (72,7) 1 (9,1)

Note: Test results: A – "suspicious"; B – "normal"; C – "not tested"

In Group II (comparison group): individual-social development under 1 year: “normal” – 64.2%, “suspicious” – 28.6%; 1–2 years: “normal” – 70.0%, “suspicious” – 20.0%; 2–3 years: “normal” – 54.6%, “suspicious” – 27.2%. Fine motor skills and adaptation: under 1 year: “normal” – 50.1%, “suspicious” – 35.7%; 1–2 years: “normal” – 50.0%, “suspicious” – 30.0%; 2–3 years:

AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES
ISSN NUMBER: 2692 - 5206 Volume 5,September ,2025

"normal" – 45.6%, "suspicious" – 27.2%. Speech development: under 1 year: "normal" – 64.2%, "suspicious" – 28.6%; 1–2 years: "normal" – 60.0%, "suspicious" – 40.0%; 2–3 years: "normal" – 81.8%, "suspicious" – 18.2%. Gross motor skills: under 1 year: "normal" – 50.1%, "suspicious" – 42.7%; 1–2 years: "normal" – 50.0%, "suspicious" – 40.0%; 2–3 years: "normal" – 72.7%, "suspicious" – 18.2%.

Conclusion. In children with septal congenital heart defects, after surgical treatment, administration of the polypeptide fraction complex, and assessment using the Denver screening test, positive outcomes were observed in gross motor skills, particularly improvements in actions such as sitting, standing, standing independently, kicking a ball with the foot, and climbing stairs. These results also positively influenced speech development, as the restoration of physical abilities expanded the child's communication scope.

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AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES
ISSN NUMBER: 2692 - 5206 Volume 5,September ,2025

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