



**ASSESSMENT OF SPEECH DEVELOPMENT AND MOTOR FUNCTION IN
CHILDREN WITH CONGENITAL HEART DEFECTS USING THE DENVER
SCREENING TEST**

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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 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 NUTQ RIVOJLANISHI VA MOTORIKA FUNKSIYASINI
BAHOLASH**

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 early detection of comorbid conditions in children with septal congenital heart defects.

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

During the study, all children (n=138) were divided into three groups: Group I (main group) included 73 children (67.6%) with septal CHDs who underwent surgery with correction of comorbid conditions. Group II (comparison group) consisted of 35 children (32.4%) who underwent surgery without correction of comorbid conditions. The control group consisted of 30 conditionally healthy early-aged children, matched by age and sex, monitored at Family Polyclinic No. 4 in Samarkand.

Inclusion criteria for the control group: Age between 1 month and 3 years; classified as first health group (healthy); absence of acute illnesses in the past month.

Results. The Denver Screening Test was used to identify psychomotor developmental delays in children with septal congenital heart defects (CHD). A comparison of the pre-treatment Denver Screening Test results in children with CHD from Group I (main group) and Group II (comparison group) is presented in the table below (Table 1).

Based on the obtained test results, a point-based evaluation was conducted: if a child was unable to perform a task appropriate for their age group — 2 points; if the child had difficulty performing the task or was unable to perform it due to their general condition — 1 point; if the task was successfully completed — 0 points. An increase in the total score indicated a higher degree of developmental delay (Kosenkova E.G., 2012).

Analysis of psychomotor development based on the denver screening test (Table 1): Prior to treatment, individual-social development in children under 1 year old from Groups I (main) and II (comparison), according to the Denver Screening Test, was assessed as follows: "Normal": 59.3%; ages 1 to 2 years: 48.9%; ages 2 to 3 years: 49.9%. "Suspect": under 1 year: 32.4%; ages 1 to 2 years: 39.3%; ages 2 to 3 years: 34.2%. Fine motor skills and adaptive behavior in children of the main group before treatment were evaluated as: "Normal": under 1 year: 49.7%; 1 to 2 years: 50.9%; 2 to 3 years: 49.9%. "Suspect": under 1 year: 37.3%; 1 to 2 years: 44.1%; 2 to 3 years: 31.8%. Speech development prior to treatment was assessed as:



“Normal”: under 1 year: 43.2%; 1 to 2 years: 32.1%; 2 to 3 years: 52.3%. “Suspect”: Under 1 year: 42.8%; 1 to 2 years: 62.7%; 2 to 3 years: 43.1%. Gross motor skills were assessed before treatment as: “Normal”: under 1 year: 36%; 1 to 2 years: 30.3%; 2 to 3 years: 54.5%. “Suspect”: under 1 year: 58.1%; 1 to 2 years: 66.2%; 2 to 3 years: 45.5%.

Table 1
Assessment of mental and motor development according to the denver screening test

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	8 (36,3)	7 (31,8)	11 (50,0)	13 (59,2)
	B	12 (54,5)	14 (63,7)	8 (36,3)	8 (36,3)
	C	2 (9,2)	1 (4,5)	3 (13,7)	1 (4,5)
Group II (comparison group) (n=14)	A	4 (28,6)	6 (42,9)	5 (35,7)	8 (57,1)
	B	9 (64,2)	5 (35,7)	7 (50,1)	5 (35,7)
	C	1 (7,2)	3 (21,4)	2 (14,2)	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	17 (58,6)	14 (48,2)	19 (65,5)	21 (72,4)
	B	11 (37,9)	15 (51,8)	7 (24,2)	6 (20,7)
	C	1 (3,5)	0 (0)	3 (10,3)	2 (6,9)
Group II (comparison group) (n=10)	A	2 (20,0)	4 (40,0)	6 (60,0)	6 (60,0)
	B	6 (60,0)	5 (50,0)	4 (40,0)	4 (40,0)
	C	2 (20,0)	1 (10,0)	1 (10,0)	0 (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	7 (31,9)	6 (27,3)	13 (59,1)	12 (54,5)
	B	12 (54,5)	14 (63,4)	9 (40,9)	10 (45,5)
	C	3 (13,6)	2 (9,0)	0 (0)	0 (0)
Group II (comparison group) (n=11)	A	4 (36,4)	4 (36,4)	3 (27,2)	4 (36,4)
	B	5 (45,4)	4 (36,4)	7 (63,8)	7 (63,6)
	C	2 (18,2)	3 (27,2)	1 (9,0)	0 (0)

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

Conclusion: Thus, comparative analysis of these indicators did not reveal statistically significant differences ($p > 0.05$). However, a general decline in gross motor skills was observed in all children with septal congenital heart defects (CHD). These included skills such as “attempts to sit,” “holds head up,” “sits,” “stands,” “stands independently,” “kicks a ball,” and “climbs stairs.”



Speech development also showed delays in benchmarks such as “says 2 words,” “says 6 words,” “combines words,” and “talks but only half is understandable.” It is known that gross motor skills and speech development are closely related to cerebral circulation. In CHD, impaired blood circulation leads to hypoxic changes in brain tissue, manifesting as psychomotor disturbances.

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