

CLINICAL–NEUROLOGICAL ASPECTS OF POST-SURGICAL CONDITIONS IN CHILDREN WITH CONGENITAL SPINAL HERNIA**Sh.Z. Yusupova, M.Sh. Khojimatova**

Abstract: This article evaluates the clinical-neurological status of children who underwent surgery for congenital spinal hernia (spina bifida), using the Denver Developmental Screening Test and the Barthel Functional Independence Index. The study was conducted in 2023–2025 at the Andijan Regional Multidisciplinary Children's Medical Center, involving 30 patients. According to the Denver test results, the majority of children demonstrated varying degrees of delay in gross motor, fine motor, speech, and social adaptation skills. Based on the Barthel Index, 50% of patients exhibited severe dependency and 50%–moderate dependency. These findings indicate the early development of neurological impairments and limitations in daily activities among children with congenital spinal hernia. The results were compared with international studies, and similarities and differences were analyzed.

Keywords: spina bifida, congenital spinal hernia, Denver developmental test, Barthel index, neurological disorders, pediatric neurosurgery, motor development delay, functional independence.

Introduction

Congenital spinal hernia is a developmental defect of the neural tube in which the hernial sac contains partially covered, altered spinal cord tissue and cerebrospinal fluid [1]. Among central nervous system malformations, congenital spinal hernias rank second after hydrocephalus, affecting approximately 1 in 1,000 newborns [9]. The main complications in affected children include severe neurological deficits such as decreased motor and sensory function, lower limb paresis or paralysis, and loss of pain and tactile sensitivity.

The primary cause of congenital spinal hernia is spina bifida—a developmental anomaly resulting from failure of neural tube closure during the 4th week of embryogenesis, leading to vertebral defects [4]. Etiological factors include both genetic and non-genetic influences such as folic acid deficiency, maternal use of anticonvulsants, and hyperglycemia associated with diabetes mellitus [6].

Globally, congenital developmental defects occur in 3–5% of newborns, and 25% of infant and early childhood mortality is attributed to these anomalies [7]. Spinal hernias are among the most common malformations of the central nervous system, with localization as follows: cervical region — 7.5%, thoracic — 10%, lumbar — 60%, sacral — 22.5% [8].

Despite surgical correction, these children often experience physical and social limitations, and are at increased risk of developing pressure sores, hydrocephalus, dysfunction of pelvic organs (urinary and fecal incontinence or retention), as well as secondary infections. These complications remain among the urgent concerns of modern pediatric neurology [7].

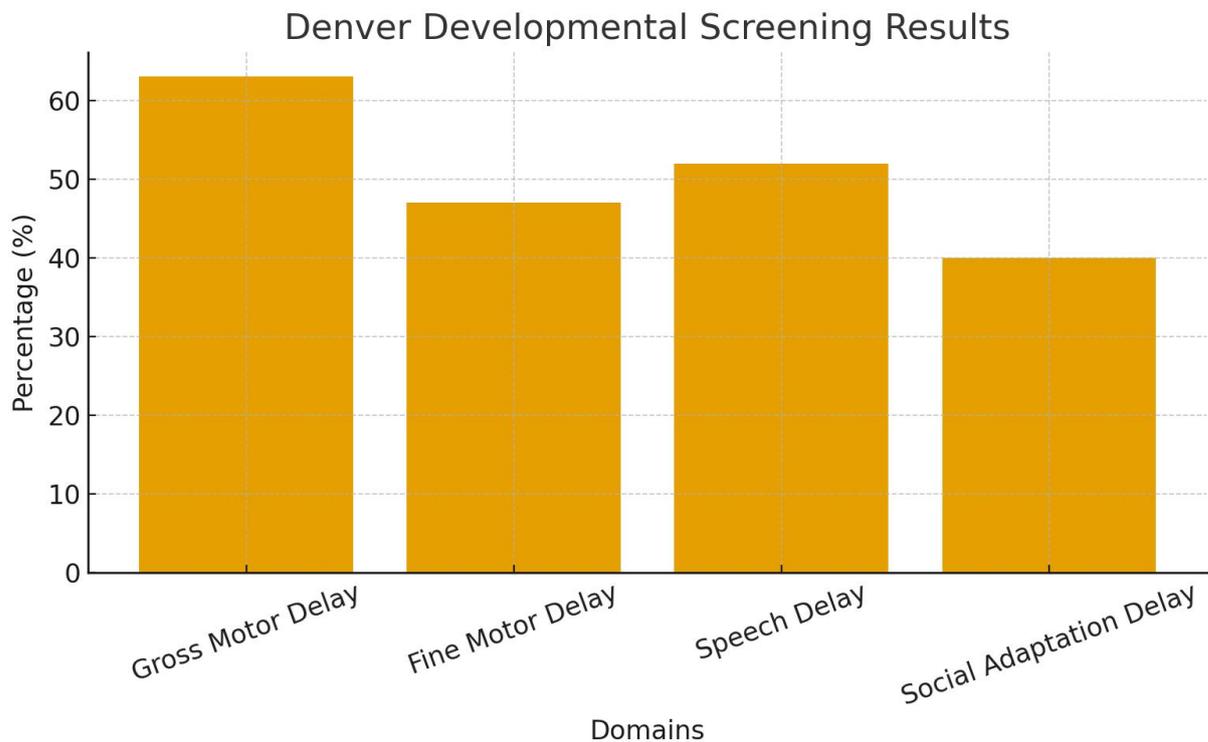
Objective

To assess the clinical-neurological condition of children who underwent surgery for congenital spinal hernia using the Denver Developmental Screening Test and the Barthel Functional Independence Index.

Materials and Methods

The study included 30 children who underwent surgical treatment of congenital spinal hernia at the Neurosurgery Department of the Andijan Regional Multidisciplinary Children's Medical Center during 2023–2025. The neurological status of each child was evaluated using the Denver and Barthel scales. The Denver test was applied to children aged 0–3 years, while the Barthel Index was used for children aged 3 years and older.

The Denver test assessed four developmental domains: gross motor skills, fine motor skills, speech/language, social adaptation.



The Barthel Index evaluated the degree of independence in daily activities, including eating, personal hygiene, dressing, bathing, bowel/bladder control, mobility, and stair climbing. According to Denver test results: 63% had gross motor delay, 47% had fine motor delay, 52% had speech delay, 40% had insufficient social adaptation.

Barthel Index Evaluation (Pre-treatment)

N ^o	Degree of Dependency	Total Score	Percentage of Patients
1	Complete dependency	0-20	-
2	Severe dependency	21-60	50%
3	Moderate dependency	61-90	50%
4	Mild dependency	91-99	-
5	Fully independent	100	-

According to the Barthel Index, 50% of children had severe dependency and 50% had moderate dependency. Complete dependency and mild dependency were not observed. These findings reflect significant neurological deficits and major limitations in daily functioning, increasing patient reliance on caregivers. Therefore, not only standard treatment but also comprehensive rehabilitation measures are crucial.

Discussion: our findings demonstrate that children with congenital spinal hernias have significant multisystem developmental impairments. Delays in gross motor skills (63%), speech development (52%), and fine motor skills (47%) are consistent with international data.

E.L. Houtrow et al. (2018) reported that 60–70% of children with spina bifida experience significant gross motor limitations [2], closely matching our 63% rate. Similarly, Mitchell et al. (2021) found speech delays in more than 50% of children with spina bifida [3], which aligns with our findings (52%). According to these authors, speech delays are often linked to hydrocephalus, high-level lesions, and congenital brain anomalies [5]. The distribution of Barthel Index scores in our study (50% severe, 50% moderate dependency) is also comparable to international research. Overall, the results support global data showing that spina bifida is associated with multisystem developmental impairments, requiring multidisciplinary management, early rehabilitation, and long-term follow-up.

Conclusion: children with congenital spinal hernias experience developmental delays across four primary domains. The Denver test allows early detection of these delays, while the Barthel Index provides a reliable assessment of functional independence in daily activities. These tools serve as effective methods for evaluating neurological status and formulating individualized rehabilitation strategies.

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