AMERICAN ACADEMIC PUBLISHER

INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

ISSN NUMBER: 2692 - 5206 Volume 6. No 02. February ,2026

UDK: 616.8-009.17;616-002.2

NEUROLOGICAL COMPLICATION OF JUVENIL (IDEOPATIC) ARTRITIS IN CHILDREN 4-18 YEARS OLD

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Abstract: Juvenile (idiopathic) arthritis (JIA) is one of the most common inflammatory connective tissue diseases in children. It is a chronic joint disorder that can have a wide variety of clinical manifestations and progressions. The main symptoms of JIA include pain, swelling, limited joint movement, and general symptoms of inflammation such as fever and fatigue. However, in addition to these disorders, children with JIA often develop neurological complications, which can significantly impair quality of life and complicate treatment. These complications remain understudied, despite their importance in clinical practice. This article discusses the main neurological complications of JIA in children aged 4-18 years.

Keywords: Juvenile (idiopathic) arthritis, neuron, pain, swelling, limited joint movement, children

Neurological complications of JIA can arise from the direct effects of inflammation on the central nervous system (CNS) or from secondary changes in the body associated with chronic inflammation. The primary mechanisms leading to neurological impairment include:

1. Inflammation and the autoimmune response. Inflammatory cytokines, such as interleukins and tumor necrosis factor, play a key role in the pathogenesis of JIA. These substances not only affect the joints but can also penetrate the central nervous system, causing neuroinflammation, which is associated with the development of various neurological symptoms.
2. Infarctions and vascular disorders. Children with JIA often develop vascular changes, including vasculitis and microcirculatory disorders, which can lead to cerebral infarctions and various neurological symptoms.
3. Intoxication and metabolic disorders. Chronic inflammation and long-term use of immunosuppressants and corticosteroids can cause metabolic disorders, including changes in mineral metabolism, which contribute to the development of neurological symptoms such as hypocalcemia or hypernatremia.
4. Psychological and cognitive disorders. Chronic illness, with long-term pain and limited physical activity, can lead to the development of depression, anxiety disorders, and cognitive impairment. These disorders may also be associated with changes in brain structure.

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Children with JIA often experience psychoemotional disorders, such as depression, anxiety, and sleep disturbances. These disorders are associated with both the psychological burden associated with the chronic illness and neuroinflammation, which can impact the centers responsible for mood and behavior.
Cognitive impairments such as memory, attention, and learning disabilities may also occur in children with long-term JIA. Some studies suggest that inflammation, as well as long-term use of medications (such as corticosteroids), may impair neuroplasticity and lead to changes in brain function.
In addition to the central nervous system, children with JIA may develop peripheral nervous system diseases, such as inflammation-associated neuropathy. The most common are mono- and polyneuropathies, which present with pain, paresthesia, sensory disturbances, and muscle weakness.

Objective of the study: To study the neurological complications of juvenile (idiopathic) arthritis in children aged 4-18 years

Materials and Methods: To determine the diagnostic value of serum homocysteine,
clinical and laboratory studies were carried out on the bloodsera of patients collected at the TSMU clinic, in the department of cardiorheumatology in children with juvenile rheumatoid arthritis. All samples were examined using the SNIBE Maglumi X3 automatic immunochemiluminescence (CHL) analyzer. The diagnosis of juvenile rheumatoid arthritis was established based on the criteria of the American College of Rheumatology (ACR) 1990. All patients included in the study underwent a traditional clinical and neurological examination and paraclinical research methods
(electroencephalography, electrocardiography, electroneuromyography (as indicated)). Assessment of neurological status:

- study of the functions of cranial nerves;

- study of the motor sphere (volume of active and passive movements, muscle tone and strength, motor skills, including fine motor skills, tendon and abdominal reflexes, the presence of pathological reflexes).

- study of the sensitive sphere, coordination sphere, vegetative sphere, function of the pelvic organs;

Specific complaints and neurological examination data indicating the presence of neurological pathology were identified in 87 (49.2%) patients. An analysis of complaints showed that headaches occurred most frequently in patients with JRA (36.5% of cases). To study its features, children with similar complaints underwent the following set of laboratory and instrumental studies:

■ X-ray of the cervical spine in direct and lateral projections revealed a narrowing or absence of the joint space; characteristics such as straightening of the cervical lordosis, rotation and displacement of the vertebrae were taken into account. In combination with stiffness, limitation of active and passive movements in the cervical spine in the clinical picture of juvenile arthritis, the above changes were assessed as early manifestations of arthritis.

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■ Doppler ultrasound (USDG) of the neck vessels, performed using a Lodgic 9 General Electra device with a linear sensor with a frequency of 10–14 Hz;

changes were noted in the vertebral and carotid arteries: the presence of dilatation, spasm, vascular tortuosity, asymmetry of blood flow, difficulty in venous outflow.

■ Fundus assessment (ophthalmoscopy); The condition of the optic nerve head and fundus vessels was assessed, and venous angiopathy of the retinal vessels was detected.

■ Homocysteine levels were assessed in 70 patients with JRA, the mean of which was 6.5 ± 2.6 (95% CI: 5.9–7.1) μmol/L. When analyzing homocysteine levels depending on gender, no differences were found (p =0.980; Student's t-test), and no correlation was found between age and HC level.

Results and Discussions: Autoimmune damage to the nervous system was diagnosed by determining the activation of B lymphocytes. To identify disorders of the vascular endothelium, the concentration of homocysteine (HC) in the blood was
measured, since it is known that hyperhomocysteinemia is an independent risk factor and an indicator of ischemic vascular processes.

Categories	**Serum homocysteine (μmol/l)**			p
	M ± SD	95% ДИ	n	
Форма				
Oligoarthritis	5,0 ± 1,5	4,3 – 5,8	18	0,002*
Polyarthritis	7,0 ± 2,2	5,8 – 8,1	17	$p_{Олиг-Поли}$ = 0,025
System	8,5 ± 3,1	5,2 – 11,8	6	$p_{Олиго-Сис}$ = 0,003
Activity				
I	5,0 ± 1,3	4,3 – 5,7	16	< 0,001*
II	6,5 ± 2,5	5,2 – 7,9	16	p_{I-III} < 0,001
III	8,4 ± 2,1	6,8 – 10,1	9	

Table 1. Analysis of serum homocysteine depending on form and activity

As we can see from the table, there was a significant relationship between the form and level of homocysteine, for example, with oligoarthritis, the average level was 5.0 ± 1.5 μmol/l, with polyarthritis, on average, it was 2 points higher (7.0 ± 2. 2), and with the most severe variant, the systemic level, the level was the highest - 8.0 ± 3.1 μmol/l. When studying activity, a similar

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trend was also revealed, however, in this case, a statistically significant difference was found only between the I degree of activity and the III degree.

Conclusions:

As a result, autonomic dysfunction, along with focal neurological deficit, prevailed in the structure of the identified neurological symptoms. When assessing the level of homocysteine, it was found that it depends mainly on the form of the disease and the degree of activity. Determination of HC levels in the blood in sick children with JRA can be assessed as a laboratory verification of ischemic damage nervous system.

Neurological complications of juvenile arthritis in children aged 4-18 years represent a significant challenge requiring a comprehensive approach to diagnosis and treatment. This complication can significantly impair children's quality of life and requires long-term monitoring and individualized treatment. Recognition of the importance of these complications and the development of new diagnostic and therapeutic methods may help improve treatment outcomes and provide children with JIA with a higher quality of life.

References:

1. Abzalilov A.A., Malievsky V.A., Gumerov R.A., Lapirov S.B., Gumerov A.A. Therapeutic arthroscopy of the knee joints in the complex treatment of juvenile chronic arthritis.// Medical Bulletin of Bashkortostan. 2012. T. 7. No. 2. P.16-19.
2. Khamidova N.A. Interrelation between the nervous and immune systems in children with rheumatoid arthritis (literature review) //Journal of Biomedicine and Practice. 2022, vol. 7, issue № 4, pp.200-209 (14.00.00 №24)
3. Khamidova N.A., Madjidova Ya.N. Results of Clinical and Laboratory (Immunological) Studies in Sick Children with Juvenile Rheumatoid Arthritis //American Journal of Medicine and Medical Sciences 2024, 14(5):1418-1420p. (14.00.00 №2)
4. Khamidova N.A., Madjidova Ya.N. Clinical Manifestations of Neurological Complications in Children with Juvenile Rheumatoid Arthritis // Research journal of trauma and Disability Studies – 2022; 1-4; (Volume: 01 Issue: 09 | Sep) Польша
5. Khamidova N.A., Aripova G.M. Craniocephalgiya and psycho-emotional background of sick children with juvenile rheumatoid arthritis // International Scientific Journal SCIENCE AND INNOVATION 2023; Series D Volume 2 Issue 7 July, 81-86 (UIF-2022: 8.2 | ISSN: 2181-3337 | SCIENTISTS.UZ)
6. Khamidova N.A. Frequency of neurological complications in children with juvenile rheumatoid arthritis // International Scientific Journal SCIENCE AND INNOVATION Series.... 2023, C 589-590
7. Khamidova N.A. Psycho-emotional and cognitive background in children with juvenile rheumatoid arthritis// Conference on the role and importance of science in the modern world, Italy, 2024, (Vol 01, Issue 08) P 137-138
8. Khamidova, N. The influence of homocysteine on the pathogenesis of juvenil rheumatoid artritis in children. Journal of Experimental Studies, 2026, 4(1), P 3–10, Retrieved from https://imfaktor.com/index.php/joes/article/view/20 13