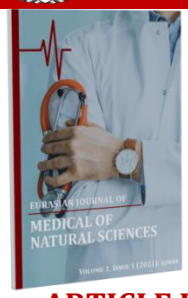
EURASIAN JOURNAL OF MEDICAL AND NATURAL SCIENCES
Innovative Academy Research Support Center
IF = 7.921 www.in-academy.uz



VARIATION OF HUMORAL IMMUNITY IN MIGRAINES IN CHILDREN AND ADOLESCENTS

Kodirova Nafisa Nizomiddin kizi
Student of Tashkent Pediatric Medical Institute,
faculty of II-pediatrics and medical biology, group № 531-2 pediatrics
https://doi.org/10.5281/zenodo.16255719

ARTICLE INFO
Received: 16th July 2025
Accepted: 20th July 2025
Online: 21st July 2025
KEYWORDS
Pediatric migraine, humoral immunity, immunoglobulin G, immunoglobulin M, circulating immune complexes, immune imbalance, migraine with aura, immunopathogenesis.

ABSTRACT
Migraine in children and adolescents is increasingly being recognized not only as a neurological disorder, but also as a condition with possible immune system involvement. This paper explores the role of humoral immunity in the pathogenesis and clinical presentation of pediatric migraine. Based on the study of 42 children aged 6 to 18 with various forms of migraine, significant differences in immunoglobulin levels and circulating immune complexes (CIC) were observed. These findings suggest the presence of immune imbalance in children with migraines, especially those with aura. Understanding the immunological aspects of migraine can contribute to improved diagnostics, prognostics, and the development of personalized therapeutic strategies.

ВАРИАЦИИ ГУМОРАЛЬНОГО ИММУНИТЕТА ПРИ МИГРЕНИ У ДЕТЕЙ И ПОДРОСТКОВ

Кодирова Нафиса Низомиддин кизи
Студентка Ташкентского Педиатрического Медицинского Института, факультет II-педиатрии и медицинской биологии, группа № 531-2 педиатрия
https://doi.org/10.5281/zenodo.16255719

ARTICLE INFO
Received: 16th July 2025
Accepted: 20th July 2025
Online: 21st July 2025
KEYWORDS
Детская мигрень, гуморальный иммунитет, иммуноглобулин G, иммуноглобулин M, циркулирующие иммунные комплексы, иммунный дисбаланс, мигрень с аурой, иммунопатогенез.

ABSTRACT
Мигрень у детей и подростков всё чаще рассматривается не только как неврологическое расстройство, но и как состояние с возможным участием иммунной системы. В статье рассматривается роль гуморального иммунитета в патогенезе и клиническом проявлении детской мигрени. На основе обследования 42 детей в возрасте от 6 до 18 лет с различными формами мигрени были выявлены значимые различия в уровнях иммуноглобулинов и циркулирующих иммунных комплексов (ЦИК). Полученные данные указывают на наличие иммунного дисбаланса у детей с мигренью, особенно с аурой. Понимание иммунологических аспектов мигрени может способствовать улучшению диагностики, прогноза и разработке персонализированных лечебных подходов.

EURASIAN JOURNAL OF MEDICAL AND NATURAL SCIENCES
Innovative Academy Research Support Center
IF = 7.921 www.in-academy.uz

BOLALAR VA O'SMIRLARDA MIGRENDA GUMORAL IMMUNITETNING O'ZGARISHLARI

Kodirova Nafisa Nizomiddin qizi
Toshkent Pediatriya Tibbiyot Instituti talabasi, II-pediatriya va tibbiy biologiya fakulteti, 531-2 pediatriya guruhi
https://doi.org/10.5281/zenodo.16255719

ARTICLE INFO

Received: 16th July 2025
Accepted: 20th July 2025
Online: 21st July 2025

KEYWORDS

Bolalar migreni, gumoral immunitet, immunoglobulin G, immunoglobulin M, aylanuvchi immun komplekslari, immun disbalans, auralik migren, immunopatogenez.

ABSTRACT

Bolalar va o‘smirlardagi migren faqat nevrologik kasallik sifatida emas, balki immun tizimining ishtiroki bilan bog‘liq bo‘lgan holat sifatida ham tobora ko‘proq tan olinmoqda. Ushbu maqolada bolalar migrenining patogenezi va klinik ko‘rinishida gumoral immunitetning roli yoritilgan. 6 yoshdan 18 yoshgacha bo‘lgan 42 nafar bolada migrenning turli shakllari bo‘yicha o‘tkazilgan tadqiqotda immunoglobulinlar va aylanuvchi immun komplekslari (AIK) darajalarida sezilarli farqlar aniqlandi. Ma’lumotlarga ko‘ra, ayniqsa auralik migren bilan og‘rigan bolalarda immun tizimi disbalansi mavjud. Migrenning immunologik jihatlarini chuqur tushunish erta tashxis qo‘yish, prognozlash va shaxsiylashtirilgan davolash usullarini ishlab chiqishga xizmat qilishi mumkin.

Introduction

According to the International Headache Society (IHS), migraine is diagnosed in only 48% of patients who experience headaches that fully meet the diagnostic criteria for migraine [2]. Pediatric migraine, in particular, poses diagnostic challenges due to the atypical and age-dependent clinical manifestations. Although migraine has been traditionally viewed as a purely neurological disorder, recent research has brought attention to the involvement of the immune system, especially humoral components, in its pathogenesis [4, 5].

Immunology today is one of the most rapidly advancing scientific disciplines. Its integration into various domains of medicine has given rise to specialized fields such as non-infectious immunology. In this context, it is hypothesized that immune system dysregulation may contribute to both the onset and progression of migraine. Specifically, immunocytes and their humoral products—such as immunoglobulins and immune complexes—may modulate pain perception, neurogenic inflammation, and vascular reactivity [3, 4].

Neuroimmunological interactions are increasingly implicated in the development of neurovascular conditions, including migraine. Several studies point to elevated levels of pro-inflammatory cytokines, mast cell activation, and altered antibody profiles in migraine patients, suggesting immune system participation in disease pathophysiology [1, 3, 6].

Objective of the Study: To evaluate clinical and humoral immunological parameters in children and adolescents with primary migraine, and to identify possible immunological differences between simple migraine and migraine with aura.

Materials and Methods: The study involved 42 pediatric patients diagnosed with migraine according to IHS criteria. The children ranged in age from 6 to 18 years (mean age:

12.10±2.49), with a gender distribution of 23 girls and 19 boys. All participants underwent comprehensive clinical and neurological evaluation in the interictal period. Immunological analyses included measurement of serum levels of immunoglobulins G (IgG) and M (IgM), as well as quantification of circulating immune complexes (CIC) of both large and small molecular sizes. The results were compared with a healthy control group matched for age and gender.

Results and Discussion: Anamnestic evaluation revealed that 23% of the patients had a history of perinatal complications, 27% had a positive family history for migraine, and 50% had unremarkable or unspecified medical histories. During neurological examination, 34% exhibited minor residual focal neurological signs, 29% demonstrated cervical spine dysfunction, and 37% showed symptoms of autonomic instability, such as labile pulse, sweating, or orthostatic reactions.

The immunological findings indicated a statistically significant reduction in IgG and IgM levels in both subgroups of migraine (with and without aura) compared to controls. The most pronounced decrease in IgG was found in children with migraine with aura. This suggests a more profound humoral immune deficit in this subgroup, potentially contributing to the pathophysiological differences between simple and complex migraine types [5, 6].

Furthermore, levels of CICs were markedly elevated in the patient group. Children with migraine with aura showed the highest concentrations of CICs, especially large-sized complexes (increase by 3%) and small-sized complexes (increase by 4%) compared to the control group. High CIC levels are often associated with chronic immune activation and have been linked to endothelial dysfunction and vascular inflammation, which are thought to play a central role in migraine pathogenesis [4, 5, 6].

The observed immune alterations may reflect underlying neuroimmune dysregulation, which could impact neuronal excitability, vascular tone, and nociceptive thresholds. These findings underscore the importance of considering immunological markers in the assessment and classification of migraine in pediatric patients.

Conclusions: Our data demonstrate that pediatric migraine is associated with detectable changes in humoral immunity, including decreased IgG and IgM levels and elevated CIC concentrations. These alterations are more pronounced in children with migraine with aura, suggesting a possible immunopathogenetic mechanism unique to this subgroup. Recognition of such immunological profiles may offer novel avenues for targeted diagnostics and individualized therapeutic strategies. Further large-scale studies are needed to clarify the precise role of immune mechanisms in pediatric migraine and to validate immune-based biomarkers for clinical use.

References:

1. Khaitov, P.M., Pinegin B.V., Yarilin A.A. Manual of Clinical Immunology: Diagnosis of Diseases of the Immune System. Moscow: GEOTAR-Media, 2009. 352 p.
2. Shamansurov Sh.Sh., Gulyamova M.K., Karimova N.A. Basilar migraine in children - an object of diagnostic error. NEVROLOGIYA. 2014; 2(58): 101.
3. Hermann G.E., Holmes G.M., Rogers R.S. TNF(α) modulation of visceral and spinal sensory processing. Curr Pharm Des. 2005;11(11):1391–1409.

4. Gazerani P. et al. The role of immune and inflammatory mechanisms in migraine. J Headache Pain. 2019; 20:122. doi:10.1186/s10194-019-1069-1.
5. Alstadhaug K.B. Migraine and the immune system. J Neurol Sci. 2014; 344(1–2): 3–7. doi:10.1016/j.jns.2014.06.028.
6. Charles A. The pathophysiology of migraine: implications for clinical management. Lancet Neurol. 2018; 17(2): 174–182. doi:10.1016/S1474-4422(17)30435-0.