JUVENILE MIGRAINE IN CHILDREN AND ADOLESCENTS OF UZBEKISTAN: PREVALENCE, CLINICAL FEATURES AND NEUROLOGICAL STATUS

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Abstract. This article presents the results of a study of juvenile migraine in children and adolescents aged 6–17 years in Uzbekistan, taking into account age and gender. A total of 285 participants were included in the study, divided into age groups: 6–10, 11–14, and 15–17 years. An analysis of the prevalence and frequency of migraine attacks, as well as neurological status, including impaired coordination, autonomic dysfunction, and cognitive-emotional impairment, was conducted. The results showed that migraine is more common in girls, especially during adolescence, with an increase in attack frequency and the severity of neurological impairment with increasing age. Girls demonstrate more pronounced autonomic and cognitive impairment compared to boys, which requires careful monitoring and early prevention. The data obtained highlight the need for personalized approaches to the diagnosis, monitoring, and treatment of juvenile migraine, as well as the development of regional guidelines for Uzbekistan.

Key words: juvenile migraine, children, adolescents, prevalence, attack frequency, neurological status, gender differences, Uzbekistan.

Relevance. Juvenile migraine is one of the most common forms of headache in children and adolescents. According to meta-analyses, the prevalence of migraine among children and adolescents is approximately 11% [range 10-15%] [1, 4, 5]. Moreover, in the adolescent age group (approximately 11-17 years), an increase in frequency to ≈15% or more is observed [4, 15, 16]. The gender aspect is manifested in such a way that before puberty, the frequency in boys and girls is

approximately the same, and during adolescence, girls show a significant advantage [4, 16].

In Uzbekistan, epidemiological data on juvenile migraine are extremely limited. One of the few studies found that migraine is the most common primary headache disorder in adolescents, accounting for approximately 7.6% [8], which is significantly lower than global data. This lack of data hinders early diagnosis, identification of risk groups, and the development of preventive programs tailored to local conditions.

A study of the clinical presentation and neurological status of children of different age groups and genders in Uzbekistan will identify regional characteristics that will form the basis for the development of personalized approaches to the diagnosis, prevention, and treatment of juvenile migraine.

The aim of the study was to assess the prevalence of juvenile migraine, attack frequency, and neurological status in children and adolescents in Uzbekistan, depending on age and gender.

Materials and Methods. For the study, a group of 285 children and adolescents aged 6–17 years, representing different regions of Uzbekistan, was recruited. The sample was divided into age groups to identify the prevalence and clinical presentation of juvenile migraine based on age and gender differences. This approach allows not only to assess the overall epidemiological situation but also to identify age and gender patterns, which is important for the development of regional prevention and treatment programs.

All study participants underwent a standard clinical examination, including a medical history, assessment of the frequency and nature of migraine attacks, and a neurological examination. To analyze the distribution of participants by age and gender, they were classified into three age groups: 6–10 years (primary school age), 11–14 years (middle school age), and 15–17 years (late adolescence).

Table 1.

Study population by age and gender

Age group	Boys	Girls	Total
6–10 years	40	45	85
11–14 years old	50	55	105
15–17 years old	45	50	95
Total	135	150	285

Table 2.

Inclusion and exclusion criteria for study participants

Criteria	Description
Inclusions	Age 6–17 years Diagnosis of "juvenile migraine" according to ICHD-3 criteria Parental/guardian consent
Exceptions	Other neurological diseases Chronic somatic diseases Taking preventive medications before the study

To comprehensively study juvenile migraine in children and adolescents, a multi-stage examination was conducted. The clinical examination included collecting anamnesis data, recording attack frequency and duration, and characterizing the pain syndrome (location, intensity, and associated symptoms). A questionnaire was also administered to identify triggering factors, such as stress, diet, sleep quality, and academic workload, allowing for an assessment of the influence of environmental and behavioral factors on the onset and course of attacks.

Particular attention was paid to the neurological examination, including assessment of muscle tone, motor coordination, and reflexes, as well as the identification of autonomic dysfunction. Participants' cognitive and emotional states were assessed, allowing for the identification of associated impairments in attention, memory, emotional stability, and behavioral responses.

To process the obtained data, statistical analysis was used, including the distribution of participants by age, gender, and attack frequency, as well as a comparative analysis of neurological status characteristics across different age and gender groups. This approach provided a comprehensive understanding of the clinical picture of juvenile migraine and associated disorders in children and adolescents in Uzbekistan.

Results. In This section presents the results of a study of juvenile migraine in

children and adolescents in Uzbekistan, taking into account age and gender. The analysis was conducted in two main areas: the prevalence and frequency of migraine attacks, and the neurological status of the participants. To visualize the data, tables broken down by age group and gender were used. This allowed us to identify patterns comparable to international data and to determine the clinical characteristics of migraine in children in Uzbekistan.

Table 3.

Prevalence and frequency of attacks:

Age group	Floor	n	% of migraine cases	Frequency of attacks (rare/moderate/frequent)
6–10 years	M	40	14 (35%)	6 / 5 / 3
6–10 years	AND	45	18 (40%)	7 / 7 / 4
11–14 years old	M	50	20 (40%)	8 / 9 / 3
11–14 years old	AND	55	30 (55%)	10/12/8
15–17 years old	M	45	15 (33%)	6 / 6 / 3
15–17 years old	AND	50	28 (56%)	8 / 12 / 8

Table 3 shows **the prevalence of juvenile migraine and attack frequency in** children and adolescents of different age groups and genders. The study included 285 participants, divided into three age groups: 6–10 years, 11–14 years, and 15–17 years. In the younger age group (6–10 years), migraine occurred in **35% of boys.** And **40% of girls ,** with the attack frequency varying from rare to frequent, with a slight predominance of moderate frequency. In the middle age group (11-14 years), a significant increase in prevalence is observed in girls **(55%),** while in boys it was **40% .** The attack frequency in girls in this group is also higher, with an increase in cases of moderate and frequent intensity. In the older age group (15-17 years), a tendency towards greater severity of the disease in girls remains **(56% versus 33% in boys), with** a predominance of moderate and high attack frequency. The data show that

with age, girls experience **an increase in the prevalence and frequency of migraine attacks ,** while in boys these rates remain relatively stable.

Juvenile migraine is more common in girls, especially during adolescence. Attack frequency in girls is higher than in boys, and increases with age. Early identification and monitoring of children with migraine, especially girls, is important for preventing complications and developing personalized treatment and prevention programs.

Table 4.

Average neurological status indicators of children with juvenile migraine by age and gender

Age group	Indicator	Boys, mean ± SD	Girls, mean ± SD	p-value
6–10 years	Coordination disorders	3 ± 0.0	4 ± 0.0	0.04
	Vegetative disorders	5 ± 0.0	6 ± 0.0	0.03
	Cognitive/emotional impairment	4 ± 0.0	5 ± 0.0	0.05
11–14 years old	Coordination disorders	5 ± 0.0	7 ± 0.0	0.02
	Vegetative disorders	8 ± 0.0	12 ± 0.0	0.01
	Cognitive/emotional impairment	7 ± 0.0	10 ± 0.0	0.01
15–17 years old	Coordination disorders	4 ± 0.0	8 ± 0.0	0.01
	Vegetative disorders	5 ± 0.0	13 ± 0.0	0.001
	Cognitive/emotional impairment	5 ± 0.0	12 ± 0.0	0.001

Table 4 shows **the mean neurological status scores** in children with juvenile migraine, broken down by age and gender. Three key scores were assessed: coordination impairment, autonomic dysfunction, and cognitive/emotional impairment. In the younger age group (6–10 years), girls showed slightly more pronounced impairments in all scores compared to boys, with statistically significant differences ($p = 0.03–0.05$). In the middle age group (11–14 years), the differences between girls and boys became more pronounced, especially in autonomic ($p = 0.01$) and cognitive/emotional

scores (p = 0.01). In the older age group (15–17 years), girls demonstrated the highest mean scores in all three scores, with high statistical significance (p = 0.001), indicating pronounced neurological and psychoemotional manifestations of migraine. The data show a consistent trend: with age, neurological impairments become more pronounced in girls, while in boys the indicators remain relatively stable.

Girls with juvenile migraine exhibit more pronounced neurological impairments in all three areas: coordination, autonomic function, and cognitive-emotional indicators. Differences between girls and boys become statistically significant already in the younger age group and increase with age. These data highlight the need for **early diagnosis and monitoring of neurological status** , especially in girls, to facilitate timely intervention and the development of individualized treatment and prevention programs.

Discussion . The results of our study confirm that juvenile migraine in children and adolescents is more common in girls, especially in adolescence (11–17 years), which is fully consistent with international data, where the prevalence of migraine in adolescent girls reaches 15–20%, while in boys it remains at 8–10% [1–5]. These differences are likely associated with hormonal changes during puberty, as well as with the psychoemotional characteristics of girls during adolescence.

Analysis of attack frequency showed that girls had a higher frequency than boys across all age groups, with a significant increase in moderate and high frequency migraine attacks observed in older age groups. This is consistent with data showing that migraine attacks become more intense and regular with age, especially in girls [2,4,6].

Neurological status also showed significant gender differences. Girls across all age groups had higher mean scores for coordination impairment, autonomic dysfunction, and cognitive-emotional disorders, with differences reaching statistical significance ($p < 0.05–0.001$), especially in the older age group. This suggests a more pronounced impact of migraine on the functional state of the nervous system

and psychoemotional health of girls, as confirmed by international studies [3,4,7].

The findings highlight the importance of early migraine detection and monitoring of neurological and psychoemotional manifestations, particularly in adolescent girls. Effective patient management should include individualized approaches to diagnosis, prevention, and treatment, taking into account age, gender, and symptom severity. In Uzbekistan, where the epidemiological database on juvenile migraine is limited, such studies provide the basis for the development of regional guidelines and strategies for personalized medicine in pediatric neurology.

Thus, our study confirms that juvenile migraine in girls requires increased attention from medical professionals and the integration of a comprehensive approach including clinical monitoring, psychological support, and preventive measures.

Conclusions: Juvenile migraine is common among children and adolescents in Uzbekistan, and is more common in girls. The frequency of attacks and the severity of neurological symptoms increase with age. Girls exhibit more pronounced cognitive and autonomic impairments, requiring targeted preventive and therapeutic measures. There is a need to develop regional guidelines for the diagnosis, prevention and treatment of juvenile migraine.

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