IJCNP, Volume 3, Issue 4, 2025 ISSN: 2995-536X
https://medicaljournals.eu/index.php/IJCNP

INTERNATIONAL JOURNAL OF COGNITIVE NEUROSCIENCE AND PSYCHOLOGY

RELATIONSHIP BETWEEN NIGHT SLEEP DISORDERS AND MIGRAINE HEADACHE SEVERITY

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Abstract: Sleep disorders and symptoms of headache, migraine in particular, are classified as chronic diseases. The prevalence of insomnia in patients with migraine, according to various authors, varies from 25% to 70%. Modern neuroimaging studies of the brain and laboratory methods of biomarkers prove the causal pathomechanism of common interactions. Thus, the anatomical architectonics of the brain, diencephalon and brainstem are the main moderators responsible for sleep/daytime activity and directly play a role in the degree of migraine, influenced by a large number of important mediators.

Key words: night sleep, headache, migraine.

Introduction. Multiple theories of the relationship between migraine and sleep disorders are based on a common point of contact dependent on circadian fluctuations, where the morning and night peak of migraine attacks directly confronts the stages of night sleep. The frequency of rapid eye movement (REM) during sleep forces patients to wake up due to the onset of headache, and conversely, migraine does not allow patients to cope with pain, which disturbs sleep, especially the deep sleep stage. Authors Simpson N.S., Scott-Sutherland J., Gautam S., Setna N., Haack M. (2018) prove this fact at the functional level of bioelectric activity changes (N.V. Vashchenko et al., 2021). Another theory of the migraine/sleep disorder interaction is hypothalamic dysfunction, where dysfunctional activity and the observed bidirectional relationship between migraine and insomnia are again considered. In addition, an important factor is the presence of sleep-disordered breathing (apnea), where a decrease in blood oxygen saturation leads to brief awakenings from sleep; notably, sleep-related respiratory insufficiency is observed in patients who are overweight. A large number of studies in recent years in the field of restless legs syndrome, with a prevalence of 28% in patients with sleep disorders, and as practice shows, significantly higher compared to patients without migraine and patients with other primary headaches. The correlation between restless legs syndrome and migraine, as proven by literary sources, depends on the level of common dopaminergic dysfunction in the hypothalamic nucleus. Migraine in the initial phase depends on migraine agonists, their sensitivity, and the reversible process of dopaminergic antagonists, where dopamine plays a major role in the pathophysiology of migraine. Thus, most patients with migraine cephalgia complain of night sleep disorders (F.S. Saidvaliev et al., 2023). The coexistence of such comorbid conditions significantly complicates the diagnosis of migraine, worsens the condition of patients, and requires mandatory correction (E.M. Evdokimova et al., 2019, Yu.G. Karnaukh et al., 2020). Diagnosis and treatment of comorbid sleep disorders should be considered when managing patients with migraine, as it is expected that improving sleep will also determine a reduction in the frequency and severity of headaches.

The Purpose of the Study, to Investigate the Interaction Between Sleep Disorders and the Risk of Migraine Development Depending on Age Trends and Gender Stereotypes

Aim of the study: To investigate the interaction between sleep disorders and the risk of migraine development depending on age trends and gender stereotypes.

Material and methods of research. The material for this study consisted of patients experiencing difficulty falling asleep at night and sleep disorders, in the form of frequent awakening and "shallow" sleep. In addition, patients complained of migraine-type headaches. The study was conducted at the

Neurology Department of the Multidisciplinary Clinic of Samarkand State Medical University (MC SamSMU) and the private clinic "Inova" during the period 2024-2025. The main group of patients with migraine consisted of 58 patients, while the control group of healthy individuals comprised 41 volunteers undergoing preventive examinations at the MC SamSMU polyclinic. Diagnosis was made in accordance with the migraine diagnostic criteria from the International Classification of Headache Disorders, 3rd edition (ICHD-III). From the main group, a smaller number of patients with migraine (9 patients) had signs of migraine with aura. In the main group of patients with migraine, there were 53 women and 5 men, with a mean age of 35.5±10 years, while in the control group there were 30 women and 11 men, with a mean age of 36±9.2 years. The comparison group consisted of 37 patients who had signs of migraine but did not have sleep disorders, including 31 women and 6 men.

There was no statistically significant difference in sex and age between the two groups; comparability in the control group was envisaged from the outset. In the first stage, patients underwent detailed questionnaires/surveys (the questionnaire was compiled arbitrarily and approved at a departmental meeting in 2024, number 7). The questions required, in addition to standard data (complaints, duration of migraine, history of illness, etc.), clarification of subjective and comorbid factors, such as the presence of harmful habits (smoking, alcohol consumption), whether the patient suffers from arterial hypertension, diabetes mellitus, body mass index (correspondence, i.e., patients with excess weight - obesity were not included in the inclusion criteria); and assessment of emotional state (anxiety-depressive elements). In the subsequent stage, after group formation, patients underwent testing on issues important for studying the problem of interaction between migraine and sleep disorders. The Pittsburgh Sleep Quality Index (PSQI), a self-assessment questionnaire on sleep quality including 19 items, identified: sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medications, and daytime sleepiness. Sleep quality disturbance is determined by a PSQI score >5, with a diagnostic sensitivity of 98.7 and specificity of 84.4. The Self-Rating Anxiety Scale (SAS) and Self-Rating Depression Scale (SDS) were used to assess anxiety and depression, including 20 items (questions) with initial manifestations corresponding to 20 to 80 points, moderate level from 25 to 100, and high level of anxiety and depression more than 100 points. A higher score indicates a higher level of mental disorder (with the threshold value for depression and anxiety corresponding to 50 points). The Visual Analogue Scale (VAS) for pain was used to assess the subjective intensity of pain. The Migraine Disability Assessment (MIDAS) scale, consisting of 5 items, where a score from 6 to 10 indicates mild disability; from 11 to 20 indicates moderate disability, and above 20 points indicates severe disability. The Migraine-Specific Quality of Life Questionnaire (MSQ), where a high score indicates a good quality of life.

Statistical processing of the study was carried out on a personal computer, using a standard data package between groups and the Mann-Whitney U-test formulas, with significance corresponding to $P<0.05$.

Results of the study, in accordance with the stated objective, patients were surveyed using scales, with anxiety and depression levels studied first. The scores for PSQI (sleep disturbances), SAS (anxiety), and SDS (depression) were significantly higher than in the control group, where $P<0.05$. Analysis of the results of studying the relationship and influence of sleep patterns on the risk of migraine development showed a correlation between migraine and sleep quality; moreover, in the general ratio, this indicator was 1.7, where sleep disorder increases the frequency of migraine attacks. When dividing patients into subgroups by: age trend; gender characteristics; harmful habits (smoking); blood pressure level; body weight, under these conditions, the indicator of relationship and influence of sleep quality was equal to 1.69, where the risk of migraine development increased, and for each unit of intensity of the presented factor. Thus, the highest correlation was observed in women over 36 years of age, with $P<0.05$. Comparison of indicators in the main group of patients (sleep disorder and migraine) with the comparison group (migraine without sleep disorder), based on the PSQI (scale) indicator, showed that the risk of migraine significantly increased in the main group of patients with impaired sleep quality, where the significance level was in the range from 5.9 to 6.4 points. The results of the comparative assessment of the index by values and criteria of sleep disorders: sleep implicancy, sleep duration,

sleep efficiency (depth), sleep individuality, sleep disorder (frequency of awakening, difficulty falling asleep, difficulty waking up), daytime sleepiness, use of sleeping medications (which ones), all these signs illustrate the prognosis of migraine in a worse condition, depending on each constituent element, where P<0.01).

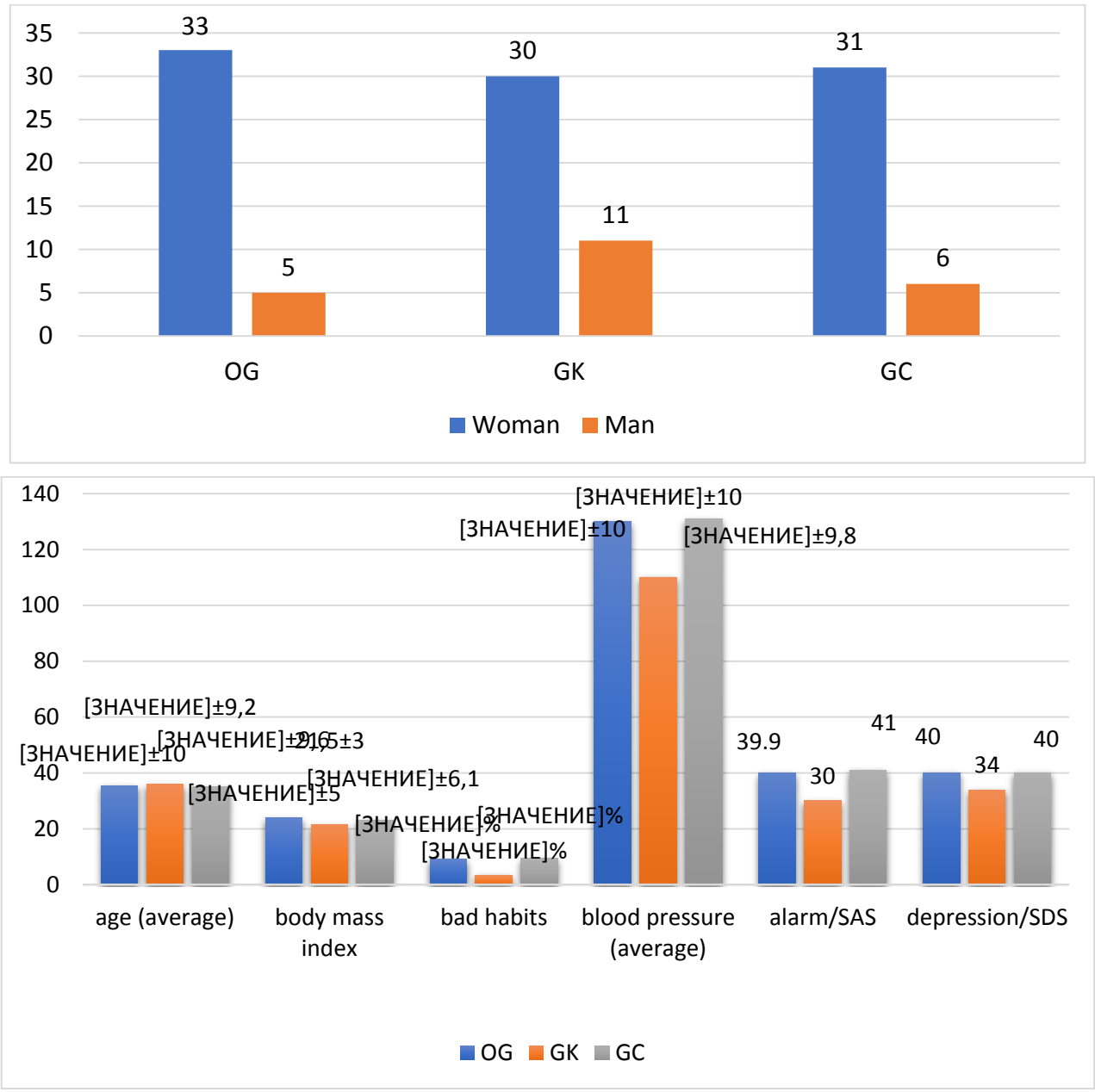

Fig.1. The result of the analysis of the relationship between sleep disorders and migraines in the examined groups

Table 2. Analysis of the result of predicting the relationship between sleep disorders and migration according to this study

№	Indicators	OG	Sensitivity, %	Specificity,%	P
1	Sleep Quality Index PSQI	0,88	56	95	<0,001
2	Subjective sleep disturbance	0,77	50	81	<0,001
3	Sleep period	0,54	31	88	<0,05
4	Sleep disorder according to clinical signs	0,78	95	35	<0,001
5	Feeling of inefficiency of sleep	0,60	40	89	<0,001
6	Daytime sleepiness	0,50	19,7	92	<0,001

7	Use of sleeping pills	0,49	9	97	<0,001
8	Anxiety	0,8	63	79	<0,001
9	Depression	0,59	42	77	<0,001

Table 3. Comparative index of magnitude and criteria of sleep disorder

№	Indicators	OG	Control Group	P
1	Sleep Quality Index PSQI	5,9-6,4 балла	2,5-3 балла	<0,05
2	The scale is YOURS	7,5±2,3	3±1	<0,05
3	MIDAS scale	24±5	5±1	<0,05
4	MSQ	35±2	60±10	<0,05
5	SAS Scale / Alarm	45,7±9	20±10	<0,05
6	SDS / Depression	46±13	19±11	<0,05

In addition, it was found that the prognosis of PSQI assessment for migraine was significantly higher in patients with high levels of depression than compared with the assessment of anxiety levels. The next stage of comparing the study data was related to sleep disorders from the level of pain on the VAS scale, disability in migraines - the MIDAS scale; quality of life in migraines - the MSQ scale; with the level of anxiety and depression on the SAS and SDS scales. The correlation indicator revealed a direct relationship between sleep disorders and high levels of pain, quality of life, and high signs of anxiety and depression. In addition, it was noted that the level of poor sleep quality in the subgroups (by age, gender, blood pressure, overweight, and patients with bad habits) also depended on the height of pain, anxiety, and depression.

Conclusions: Thus, the result of the study justified the assumption of the dependence of sleep disorders on their components (sleep quality, sleep efficiency, sleep personality) from the height of the pain syndrome in migraines. At the same time, the scale of the migraine sleep quality index - PSQI showed a number of clinical signs and prognosis of sleep disorders in migraines. Of all the divisions into subgroups by age, high body weight, bad habits, gender differences, and high blood pressure, the gender of patients is not reliable, due to the small sample size of male patients, as in the case of patients with migraine with aura. Sleep disorders are statistically significantly dependent on and proportionally increase the risk of developing migraines without aura, while using the PSQI sleep quality index scale makes it possible to correctly assess the condition at the early stages of the disorder, thereby optimizing the treatment of patients with migraine, will make it possible to improve the effectiveness and quality of sleep.

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