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Characteristics of Sleep Disorders in Patients with Essential Arterial Hypertension

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Abstract: Objective: To study the characteristic features of sleep disorders specific to patients with arterial hypertension. Material and methods: Research and approaches: As part of our analysis, a main group of 42 participants was formed, including 20 women and 22 men aged 59 to 74 years with established diagnoses of chronic cerebrovascular diseases and hypertension. The control group (CG) consisted of 24 healthy volunteers, including 14 women and 10 men of average age of about 50 years. To assess sleep disorders, both a subjective method - a questionnaire on sleep quality, and objective data from a polysomnographic study were used. Results: The studies showed that 97% of patients with arterial hypertension complained of problems with night sleep. Disturbances in all aspects of sleep structure were recorded, including a significant increase in the time required to fall asleep (33.5±7.7 min), as well as more pronounced wakefulness during sleep (20.1±6.9%), compared with the control group ($p<0.01$). No serious respiratory disorders during sleep were detected in the grouped patients. A statistically significant reduction in the total duration of sleep (375±71 min) and its efficiency index (80.7±19.2) was also observed. In the control group, the apnea index was 17.1±9.8 versus 5.3±1.4 ($p<0.001$). The oxygen saturation level was 84.2±1.4% in patients of the main groups and 96.4±1.1% in the control group ($p<0.05$). Conclusion. In patients with arterial hypertension, there is a connection between sleep disorders characterized by psychophysiological insomnia and the intensity of the vegetative syndrome, as well as the severity of the underlying disease.

Keywords: Hypertension, sleep disorders, Polysomnography, CVD.

Introduction

Sleep disorders are becoming an increasingly common problem affecting various aspects of health. Insomnia, as one of the most common forms of sleep disorders, in turn, can serve as a precursor to many serious diseases. Studies show that chronic sleep deprivation is associated with an increased risk of developing hypertension, which emphasizes the importance of adequate sleep for maintaining cardiovascular health.

In the context of an increasing trend of sleep disorders, it is important to pay attention to prevention and timely treatment in order to break this vicious circle and improve the overall health of the population. Contacting specialists and changing your lifestyle can be key steps towards healthy sleep and a better quality of life.

This emphasizes the importance of preventive measures and active blood pressure control. Programs to reduce hypertension and normalize body mass should become a priority in public health. A lifestyle that includes regular physical activity, a balanced diet and giving up bad habits

can significantly reduce the risk of cardiovascular diseases. In addition, it is necessary to implement systemic approaches to the treatment of patients with established diagnoses. Effective treatment strategies, including drug therapy and rehabilitation measures, will help prevent the development of acute forms of coronary heart disease and reduce the likelihood of stroke. It is important for patients to be actively involved in their treatment, understand the risks and follow doctors' recommendations.

Methodology

We must not forget about the importance of regular medical examinations, especially for people with risk factors. Early diagnosis and an individualized approach to each case allow you to notice and correct deviations in time, which will ultimately have a positive effect on the overall mortality rate from cardiovascular diseases.

The problem of sleep disorders has a long history and remains relevant today. One of the main reasons for the interest of clinicians in sleep disorders is their high prevalence in the population. According to a number of epidemiological studies in populations of different age groups, up to 95% of people have problems related to sleep. Insomnia symptoms occur three times a week in 16-21% of cases and are significantly more pronounced in 10-28% of cases. Sleep dissatisfaction is present in 8-18% of cases; more than 25% of elderly people regularly or frequently use sleeping pills. In today's world of accelerated pace of life and increased nervous tension, the problem of sleep disorders is becoming increasingly important. Modern research strengthens the conviction that sleep disorders should play a much greater role in the practice of treating CVD than was done in the past. Of particular importance are studies of respiratory disorders associated with sleep. Sleep disorders are a common manifestation of functional disorders of the nervous system with constant or very severe mental and emotional disorders (neuroses, reactive states). In functional disorders of the nervous system and psychoses, sleep disorders are often the main, and sometimes the only complaint. Sleep disorders are observed in organic diseases of the brain, in particular in atherosclerosis of the cerebral vessels and in lesions of the brain stem of various etiologies (inflammatory, tumor, vascular). In this research work, we plan to study the current problem of insomnia in a common pathology that neurologists encounter due to the development of various neurological complications - encephalopathy, acute and chronic cerebral blood flow disorders, cognitive dysfunction, etc., and which should be considered in matters of etiopathogenesis, clinical course, diagnosis and therapy together with therapists and cardiologists - this is hypertension (HT). According to WHO reports (2016), cardiovascular diseases (CVD) are still the leading cause of death worldwide - more than 17 million deaths from the total number of chronic noncommunicable diseases (NCD), of which more than 7 million are associated with coronary heart disease (CHD) and more than 6 million are caused by stroke. In order to achieve a 25% reduction in the risk of premature death from noncommunicable diseases by 2025, as a global goal of WHO, it is necessary to identify modifiable factors, one of which is high-quality healthy sleep. All patients in the study were diagnosed with various forms and stages of chronic cerebrovascular disease: residual effects of CVD with discirculatory encephalopathy (DE) stage I-II or mild neurological impairment. The diagnosis of ED and its stages was based on generally accepted criteria (E. V. Shmidt et al., 1976; E. V. Shmidt, 1985), based on stroke < 3 months. The first main group consisted of 42 patients (22 women and 20 men) with chronic CVD (CCVD) and hypertension (HT) aged 59-74 years. All patients were diagnosed with essential AG according to the WHO/MOAH 1999 criteria. The average duration of AG was 7.6±5.6 years. Signs of left ventricular myocardial hypertrophy (LVH) according to electrocardiogram (ECG) were detected in 100% of patients with AG. Patients with alcohol dependence, mental illness, stage 3 AG (BP> 180/110 mm Hg), secondary AG, BMI> 25 kg/m2, diabetes, dyslipidemia (DLP), ischemic heart disease, frequent (> 4 per month) hypertensive crises (HCr), sinus bradycardia - heart rate (HR) < 55 beats/min, liver and kidney failure were not included. It should be emphasized that the main symptoms of chronic central venous thromboembolism and hypertension are not stable by their nature, they "flicker" and depend on specific exogenous and endogenous factors. Deterioration of the patients' condition was often a

consequence of intense mental activity, especially against the background of hypoxia, severe fatigue, anxiety, fluctuations in blood pressure and sudden changes in weather conditions. On the contrary, improvement of the condition was associated with the elimination of these unfavorable factors, after rest, the use of drugs that have a positive effect on hemodynamics and cerebral metabolism, and the normalization of psychological stress in the patient. However, as a rule, this improvement was not stable, and when unfavorable conditions arose, all symptoms resumed. The clinical symptom complex included complaints of decreased mental and physical activity, lethargy, increased frequency of headaches and dizziness of a non-systemic nature, complaints of increased general weakness, sudden fatigue and exhaustion when performing routine tasks, poor concentration, difficulties with timely switching of attention and organization of activities, decreased performance, tinnitus and a feeling of "emptiness", emotional instability. These include. Examination of the respiratory organs did not reveal chronic lung diseases. Examination of the respiratory system function showed a decrease in the vital capacity of the lungs (at least 35% of the norm), but did not reveal any violations of bronchial patency. The most common pathology of the main arteries of the head were isolated early signs of atherosclerotic lesions of the carotid arteries in the form of focal thickening of the intima-media complex and hemodynamically insignificant (<30%) stenosis of various sections of the extracranial branches of the MAG. The main change in the vertebral artery was deformation. The control group consisted of 24 healthy volunteers (14 women and 10 men) aged 49.3±8.2 years. The exclusion criteria were: alcoholism, mental illness or disability, unwillingness of the patient to cooperate, stage III hypertension (BP>180/110 mmHg) and secondary hypertension, hypertension progression over the past month, STEMI, stroke, pulmonary embolism <3 months before the study, heart failure functional class II-IV (NYHA Functional Classification of Heart Failure (HF) II-IV according to NYHA criteria, aortic stenosis, bilateral renal artery stenosis, unstable angina or angina of effort FC III-IV, severe cardiac arrhythmia and conduction disturbances, peripheral circulatory disorders FC I-IV according to Fontaine criteria, severe neuropathy, hypothyroidism, acromegaly, otolaryngological pathology, facial dysplasia. All patients underwent a general examination, neurological and psychomotor status examination, electrocardiography, Doppler ultrasound, endoscopy, radiography or MRI of the head, clinical and biochemical blood and urine tests. Subjective assessment of the main clinical symptoms was performed using a five-point rating scale with standardized criteria for assessing the severity of each symptom: 0 - no symptoms, 4 - severe symptoms. The study of the neurological status included an assessment of motor, vestibular, extrapyramidal, sensory and pseudobulbar paralysis using a five-point scale with standardized criteria for assessing the severity of each symptom. Vegetative disorders were assessed using a questionnaire developed at the Department of Pathology of the Autonomic Nervous System of the Sechenov Moscow Medical Academy. A total score of 15 or more on the questionnaire indicates a clinically significant vegetative disorder. Psychological tests assessed anxiety and depression - two main components of affective disorders: HADS - Hospital Anxiety and Depression Scale; Zigmond AS, et al. 1983. Subjective assessment of sleep quality to study the frequency and severity of sleep disorders in patients, a questionnaire for subjective assessment of sleep disorders developed by the Somnology Center of the Ministry of Health of the Russian Federation was used. In this questionnaire, patients were asked to assess the following sleep parameters: - time of falling asleep, duration of sleep, number of awakenings, quality of sleep, number of dreams, quality of morning awakenings. Assessments were given on a five-point scale with standardized criteria for assessing the severity of each parameter, with the lowest value corresponding to general symptoms. After filling in the questionnaire, the total score was calculated. A total score of <18 indicated subjectively poor sleep quality, >22 indicated good sleep quality, while a score of 18-22 points indicated borderline sleep quality. Objective assessment of sleep parameters and sleep events An objective assessment of sleep parameters was performed using polysomnography, which records electroencephalography (EEG), electrooculography (EOG), and electromyography (EMG) of the jaw muscles in the central and occipital leads in parallel, according to the international 10×20 system. Sleep phases and standard sleep phases were determined in accordance with the international classification of

Rechtschaffen A., Kales A. Atlas. Each 30-second interval (epoch) of the polygraph recording was visually processed in the Statistica 6.0 program (StatSoft, Inc.). Quantitative features with a normal distribution were described by the mean (M) and standard deviation (s), features without a normal distribution - by the median (Me) and quartiles (Q1; Q3). For quantitative features, the Mann-Whitney test was used to compare unrelated groups. The dynamics of features in the group was analyzed by the Wilcoxon method; the $\chi 2$ test and Fisher's exact test were used to compare the frequency of feature values in the group. Significant differences were considered statistically significant at $p<0.05$.

Results

When analyzing the psychological characteristics in the group. In patients with hypertension, an increase in the indicators of anxiety and depressive disorders was revealed - 11.3±1.5 points and 10.4±2.3 points, respectively, and the presence of pronounced vegetative manifestations (27±5.9 points) compared with the data of the GC ($p<0.05$).

97% of patients complained of sleep disturbances at night. The average sleep quality score was 16.1±4.3, with sleep disturbances being more pronounced in this group of patients; patients with CKD and AG complained of difficulties in falling asleep, nocturnal awakenings, and early awakenings. The lowest subjective assessments concerned all the main sleep characteristics, the most pronounced of which were the prolongation of the time to fall asleep and increased dream activity compared to GC. An objective polysomnographic sleep study showed a statistically significant decrease in the sleep efficiency index and total sleep time in patients with CCVD and AG compared to GC (78±2.2% and 384±72 minutes, respectively) ($p<0.05$).

Conclusion:

Thus, it can be stated that complaints of sleep disorders in patients with chronic cerebrovascular accidents do not correlate with the severity of respiratory disorders during sleep, but reflect the presence of a psychovegetative syndrome characterized by anxiety-depressive manifestations and psychophysiological insomnia. Complex therapy of patients with chronic cerebrovascular accidents should include both the correction of respiratory disorders during sleep and adequate treatment of psychovegetative disorders and anxiety-depressive disorders. A correlation between neurophysiological and psychoemotional changes in dysomnia in patients with hypertension was revealed for the choice of psychocorrection.

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