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Fund “Nauka” Project № 21006 Resume – Competition-Based Session 2021:

“A rhinomanometric study of the characteristics and quality of the nasal breathing in patients with obstructive sleep apnea and snoring, proposed for a conservative treatment with intraoral devices”

Project leader: Prof. Mario Petrov Milkov, MD, PhD

Obstructive sleep apnea (OSA) and snoring syndrome (OSAS) is a widespread disease of social significance in which there is a reduction or cessation of airflow through the nose/ mouth during sleep, due to a collapse of the upper respiratory tract. Obstructive sleep apnea affects the cardiovascular, endocrine, neuro-cognitive and other systems of the body. Symptoms of severe snoring, choking, hypoxemia and micro-awakenings, which lead to sleep fragmentation, daytime fatigue and drowsiness, are observed. The latter greatly impairs patients’ quality of life. There are real risks to the life and health of the patients and others, given the possibility of falling asleep at the wheel (drivers with sleep apnea) and participation in traffic accidents. Polysomnographic examination, which is, for the time being, the gold standard, is performed to prove the syndrome in the patient. In order to better diagnose it, clinicians recommend combining it with a rhinomanometric examination. Treatment of OSA includes risk control and elimination of obstructive factors that impede breathing. Severe obstructive sleep apnea syndrome is treated with Continuous positive airway pressure (CPAP) therapy during sleep, as well as with a combination with intraoral dental appliances.

Rhinomanometry can also be used to monitor the effectiveness of the CPAP-therapy in severe forms of the syndrome by establishing tissue resistance. The effect on patients with milder forms of OSA, treated with intraoral devices, is also monitored. The method can also be used in patients with allergic rhinitis, sinusitis of rhinogenic and other origin, in patients with orthodontic deformities and others.

Obstructive sleep apnea and snoring (OSAS) syndrome is a widespread disease of social importance, in which there is a decrease or cessation of airflow through the nose/ mouth during sleep, due to the collapse of the upper airways. Obstructive sleep apnea affects the cardiovascular, endocrine, neurocognitive and other systems of the body. There are symptoms of severe snoring, choking, hypoxemia and micro-awakenings, which lead to sleep fragmentation, daytime fatigue and drowsiness, greatly worsening the quality of life of affected patients. There are real risks to the life and health of the patient and community members, given the possibility of falling asleep at the wheel in drivers with sleep apnea and involvement in traffic accidents. A polysomnographic examination is performed to diagnose the syndrome. For better diagnosis, it is recommended to combine it with rhinomanometry. It can also be used to monitor the effectiveness of CPAP therapy in severe forms of the syndrome by determining tissue resistance. The response of patients with a milder form of OSA treated with intraoral devices is also monitored. The method can also be used in patients

with allergic rhinitis, sinusitis of rhinogenic and other origin, and patients with orthodontic deformities.

The authors found an increase in the resistance of the tissues of the upper respiratory tract (URT) in patients with proven mild and moderate forms of OSA, proposed for treatment with intraoral dental devices. A similar increase, but weaker, was found in patients with only snoring present. The patency of the URT was found to be improved after taking steps to treat the existing form of OSA. Treatment of an existing allergic disease also has a positive effect on the form of OSA – this was proven by examining nasal patency with rhinomanometry. The predominant nasopharyngeal inflammatory pathology was identified, namely – chronic sinusitis, chronic pharyngitis, chronic laryngitis, in patients who were opera singers, and values of the patency of the URT were also established – within normal and pathological limits.