



Effectiveness analysis of the use of an occlusal stabilization appliance (OSA) and neuroprotein type A in the treatment of patients with internal disorders of the temporomandibular joint and hypertonicity of the masticatory muscles

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ABSTRACT

Objectives: The aim of our study was to determine the efficacy of the combination botulinum toxin type A injections and splint therapy in the treatment algorithm for patients with diseases of the temporomandibular joint.

Material and methods: The study group of patients consisted of 90 people with internal disorders of the temporomandibular joint and hypertonicity of the masticatory muscles. Patients were included in the study group based on the data of magnetic resonance imaging of the temporomandibular joint and surface electromyography of the masticatory muscles according to the algorithm we developed. For standardization and reproducibility of surface electromyography, when applying electrodes, a facebow with a waterpas fixed on it was used. The position of the patient's head was strictly horizontally in three planes, and the electrodes were applied under the control of the focusing grid of the camera screen. The main index for assessing the tone of the masticatory muscles is the IMPACT index, which is characterized by the sum of the average amplitudes of contractions of the masticatory muscles. Normally equal to or less than 1500 μ V.

For all patients of the study group an occlusal stabilization appliance (OSA) was made and used, as well as injection of botulinum toxin type A into the masticatory, temporal and lateral pterygoid muscles under the control of a needle electromyograph to prevent the development of complications and diffusion of the drug into the underlying tissues.

To determine the efficacy and feasibility of the combination treatment consisting of OSA and neuroprotein in the study group, an analysis of the OSA effectiveness was carried out after a month

of using the splint and at stages 2 and 4 weeks after drug administration using surface electromyography.

Results: According to the control surface electromyography after a month of using the occlusal stabilization appliances, an average decrease in the tone of the masticatory muscles by 23% relative to the initial value was revealed. 2 weeks after the administration of the neuroprotein type A, the average decrease in the tone of the masticatory muscles was 53% relative to the initial value. After 4 weeks - 65% ($p < 0.05$).

Conclusion: The combined use of an occlusal stabilization appliance and botulinum toxin type A has great potential in detecting patients with masticatory muscle hypertonicity and internal disorders of the temporomandibular joint. In addition, the duration of the neuroprotein action in the muscles ranges from 4 months to six months, which makes it possible to carry out dental procedures without the complication risk from the temporomandibular joint and masticatory muscles and thus being a "therapeutic window".

BIOGRAPHY

Dmitry Lyan has completed his PHD at the age of 30 years from Federal State Budgetary Educational Institution of Higher Education Moscow State University of Medicine and Dentistry named after A.I. Evdokimov of the Ministry of Healthcare of the Russian Federation. He has 8 publications of which 1 is in the journal reviewed by Scopus.

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