МЕДИЦИНСКИ УНИВЕРСИТЕТ - ВАРНА
„Проф. д-р Параскев Стоянов“
Ул.“Марин Дринов“ 55, Варна 9002, България
Тел. : 052/ 65 00 57, Факс: 052/ 65 00 19
e-mail: uni@mu-varna.bg, www.mu-varna.bg

MEDICAL UNIVERSITY - VARNA
“Prof. Dr. Paraskev Stoyanov”
55, Marin Drinov Str., 9002 Varna, Bulgaria
Tel.: +359 52/ 65 00 57, Fax: + 359 52/ 65 00 19
e-mail: uni@mu-varna.bg, www.mu-varna.bg

Fund “Nauka” Project № 17016 Resume – Competition-Based Session 2017:
“Investigating the effectiveness of the low energy infrared laser in influencing an oral pain symptomatology”
Project leader: Assoc. prof. Miglena Ilieva Balcheva - Eneva, MD, PhD

The **aim** of this project is to study effectiveness of low-level laser therapy (LLLT) on oral pain symptoms.

Pain accompanies the everyday life of dentists and their patients – it can be spontaneous, provoked, with a clear etiology, or difficult to determine, iatrogenic, psychogenic or neuropathic. One of our main tasks is to cope with it. Two of the oral pain symptoms that are still a challenge for us are burning mouth syndrome and dentin hypersensitivity.

The so-called „Burning mouth syndrome” (BMS) covers about 4% of the population, as females prevail. It is assumed that a wide range of factors induces its development, but the exact etiology and pathophysiological mechanisms are not established yet. In order to differentiate primary burning mouth syndrome, it is good to exclude iatrogenic factors such as oral galvanism and allergy to dental restorative materials. This determines the need for focal and allergological diagnostics, and the use of thermal imaging camera will optimize the accuracy of reading.

The idea of neuropathic mechanism of the disease is currently relevant, as the psychological triggers are left in the background. Therefore, the treatment method of choice for BMS is low-level laser therapy. There is insufficient data in the literature on this approach, but it is assumed that LLLT leads to nerve restoration and reduction of sensory sensation.

Another problem with a strong social aspect is dentin hypersensitivity – it covers between 4% - 67% of the population or about 14% of those attending dental practices – adolescents and females prevail.

Dentin hypersensitivity, defined as sharp, short and provoked pain, is most commonly explained by Brännström’s hydrodynamic theory. It occurs when dentinal tubules on the root surface are open and un-occluded. Nerve excitability is triggered by external stimuli like cold, air blasting, electrical irritation and osmotic changes. Most treatment alternatives seek for occlusion of open dentinal tubules and reduction of

pulpal nerve excitability. In this case, we can try to reduce the intensity of pain through low-level laser therapy – there is just a few, but promising data for the method in the literature.

Despite the fact that the considered pain symptoms are localized in the teeth and on the tongue, lips and other parts of the oral mucosa, they have a pronounced negative impact on the psycho-emotional status of sufferers, on their nutrition, speech and social life.

Achieved results:

In response to the aim to study the effectiveness of the low-level infrared laser in the control of oral pain symptoms, it was found that the protocol followed with the usage of this laser type is effective, safe and inexpensive. These advantages lead to the possibility of wide use of the methodology in everyday dental practice.

The achieved theoretical results are of a confirmatory nature – it was found that the prevalence of the studied pain symptoms by sex, age and location corresponds to the data reported in the scientific literature and periodicals. Burning mouth syndrome affects mainly older individuals and women, and dentin hypersensitivity affects younger individuals and women; the most common location of pain in burning mouth syndrome is the tongue, and in dentin hypersensitivity – the premolars. We confirmed the effectiveness of the method – in both studied nosological entities the strength of the pain sensation decreases, and there are cases of burning mouth syndrome with total elimination of pain. The average reduction of pain in burning mouth syndrome is 63.62 ± 31.70%, and in dentin hypersensitivity is 60.42 ± 13.35%. In both conditions, the reduction in pain is more pronounced in men. It was also proved that the longer duration of complaints is associated with a higher degree of pain catastrophizing, and this leads to a marked decrease in the quality of life of patients in personal, family and occupational aspect.

The results concerning application confirm the need for a sufficient number of procedures in order to achieve and maintain the analgesic effect of low-level laser – at least 10 procedures for burning mouth syndrome and 6 procedures for cases of dentin hypersensitivity. Patients report for pain reduction after 1 or 2 procedures in dentin hypersensitivity cases, and after the third procedure in burning mouth syndrome cases. The use of pharmacological agents such as alpha lipoic acid in addition to laser therapy usually potentiates the process in cases of burning mouth syndrome. Conversely, the interruption of the treatment protocol at an early stage leads usually to recurrence.