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MESODIENCEPHALIC MODULATION – AN EFFECTIVE METHOD FOR THE TREATMENT OF GLOSSALGIA: CLINICAL OUTCOMES

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Abstract
The study examines the clinical efficacy of mesodiencephalic modulation (MDM) in the treatment of glossalgia, a disorder characterized by persistent pain and paresthetic sensations in the absence of structural tissue alterations. The method is based on targeted impulse stimulation of mesodiencephalic brain structures, aimed at correcting autonomic dysregulation, neurohumoral imbalances, and psychoemotional disturbances.
The study included patients with various forms of glossalgia who underwent a 13-session course of MDM therapy using the "MDM-2000/1" device. Clinical assessment encompassed the evaluation of pain intensity, autonomic function, psychoemotional status, and systemic physiological markers. Post-treatment analysis demonstrated a statistically significant reduction in pain and paresthetic sensations, improved autonomic balance, and normalization of psychoemotional parameters. Objective measurements, including heart rate variability, hemoglobin concentration, oxygen saturation, and immune response markers, confirmed the systemic impact of MDM therapy. The absence of severe adverse reactions and high therapeutic efficacy substantiate the clinical relevance of MDM therapy in the management of glossalgia.

Keywords: Glossalgia, mesodiencephalic modulation, neurostimulation, autonomic nervous system, neurohumoral regulation, pain syndrome, paresthesia, psychoemotional status, clinical efficacy, physiotherapy.

Introduction

Glossalgia is a disorder characterized by persistent pain and paresthetic sensations in the absence of structural changes in the oral tissues. The condition is associated with autonomic dysfunction, neurohumoral imbalance, and psychoemotional disturbances, requiring targeted neuromodulatory intervention. Existing physiotherapeutic approaches, including electrosleep therapy, transcranial electrical stimulation (TES), and laser therapy, do not provide a comprehensive effect on the systemic mechanisms involved in glossalgia pathogenesis. Their therapeutic action is limited to local neurovascular regulation, lacking the capacity to modulate central neurohumoral and autonomic processes.

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Mesodiencephalic modulation (MDM) is a physiotherapeutic method affecting subcortical brain structures responsible for pain processing, autonomic regulation, and psychoemotional responses. Impulse electrical stimulation at a carrier frequency of 10,000 Hz with low-frequency modulation (20–100 Hz) provides targeted influence on the mesodiencephalic region, contributing to neurofunctional reorganization.

The study evaluates the clinical outcomes of MDM therapy in patients with glossalgia by assessing pain intensity, autonomic function, psychoemotional status, and systemic physiological parameters before and after a 13-session treatment course. The results establish the role of MDM in optimizing treatment protocols for glossalgia and expanding the scope of effective physiotherapeutic interventions.

Glossalgia, also known as burning mouth syndrome, is a chronic pain disorder characterized by burning or pain sensations on the tongue without visible clinical manifestations [1]. The etiology of glossalgia remains insufficiently studied, with both local and systemic factors presumed to contribute to its development [2]. Traditional treatment methods include pharmacotherapy, psychotherapy, and physiotherapeutic procedures; however, their effectiveness is often limited [3]. In recent years, mesodiencephalic modulation (MDM) has attracted the attention of researchers as a potentially effective treatment for glossalgia [4]. MDM is a physiotherapeutic technique based on the application of impulse currents of specific frequency to the mesodiencephalic structures of the brain, promoting pain sensitivity modulation and improving neurovegetative regulation [5].

Several clinical studies have demonstrated the positive effects of MDM on patients with glossalgia [2]. A reduction in pain intensity, improvement in general well-being, and enhanced quality of life have been observed [3]. Moreover, MDM has shown high safety and good tolerability, making it a promising approach in the comprehensive treatment of glossalgia [1, 5].

Materials and Methods

The study included patients diagnosed with glossalgia, verified through clinical examination and medical history analysis. The inclusion criteria were the presence of persistent pain and paresthetic sensations in the tongue for at least six months, absence of structural changes in the oral mucosa, and no prior physiotherapy treatment. Exclusion criteria included neurological disorders, systemic inflammatory diseases, psychiatric conditions, and contraindications to electrical stimulation.

Patients underwent a 13-session course of mesodiencephalic modulation (MDM) therapy using the "MDM-2000/1" device. The procedure involved frontal-occipital electrode placement to target mesodiencephalic structures. Electrical stimulation was applied at a carrier frequency of 10,000 Hz, with low-frequency modulation from 20 to 100 Hz. The current intensity was individually adjusted within a range of 0.5 to 4 mA based on patient sensitivity. Each session lasted 30 minutes. The first three days included two sessions per day with a six-hour interval, followed by a single session per day for the remaining treatment period.

Pain intensity was assessed using the Visual Analog Scale (VAS) before and after treatment. Heart rate variability (HRV) analysis was performed to evaluate autonomic function, with recorded indices of sympathetic and parasympathetic activity. Psychoemotional status was assessed using the Minnesota Multiphasic Personality Inventory (MMPI) and the Well-Being, Activity, and Mood Scale (SAN test). Blood oxygen saturation (SpO_2) was measured by pulse oximetry, and complete

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blood count (CBC) was performed to determine hemoglobin concentration. Immunological parameters, including absolute T-lymphocyte count, were analyzed to assess systemic therapy effects.

Statistical analysis was conducted using SPSS 26.0. Data distribution normality was determined by the Kolmogorov-Smirnov test. Parametric data were analyzed using the paired t-test, while non-parametric data were assessed with the Wilcoxon signed-rank test. The significance threshold was set at $p < 0.05$.

Results and Discussion

The study included 48 patients diagnosed with glossalgia, divided into two groups: 24 patients underwent mesodiencephalic modulation (MDM) therapy, while 24 received conventional symptomatic treatment. The duration of symptoms before treatment ranged from six months to three years.

Before treatment, all patients experienced burning, tingling, or foreign body sensations in the tongue. After MDM therapy, more than 70% of patients reported a significant reduction in pain and discomfort, while in the control group, only about 40% experienced mild symptom relief.

Heart rate variability analysis showed that patients in the MDM group demonstrated improved autonomic balance, with a reduction in stress-related responses and an increase in parasympathetic activity. In contrast, patients in the control group showed no substantial changes in autonomic function.

Patients who received MDM therapy showed improved blood oxygenation and better circulation, with increased energy levels and reduced fatigue. In comparison, patients in the control group did not report noticeable changes in these parameters.

In the MDM group, blood tests indicated a positive shift in immune function, particularly in T-lymphocyte activity, suggesting a possible systemic regulatory effect. No significant immunological changes were observed in the control group.

Comparative Clinical Outcomes

Clinical Parameter	MDM Group (n=24)	Control Group (n=24)
Significant pain reduction	70%+	40%
Improvement in tongue sensitivity	Yes	Minimal
Autonomic nervous system balance	Improved	No change
Oxygenation and circulation	Improved	No significant change
Immune function response	Positive shift	No change

Discussion

The findings confirm that MDM therapy effectively reduces pain, improves sensory function, and enhances autonomic and immune regulation in patients with glossalgia. Most patients in the MDM group experienced rapid symptom relief and a general improvement in well-being, whereas patients receiving only symptomatic treatment showed slower and less consistent progress.

The observed improvements in circulation and immune function suggest that MDM therapy may provide not only symptomatic relief but also systemic physiological benefits. Given the non-

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invasive nature and good tolerability of the treatment, MDM therapy can be recommended as an effective component of a comprehensive approach to glossalgia management. Future research should focus on long-term effects and the optimization of stimulation protocols to further enhance treatment outcomes.

Conclusion

The study demonstrated that mesodiencephalic modulation (MDM) therapy is an effective method for the treatment of glossalgia, offering significant clinical benefits compared to conventional symptomatic approaches. Patients who underwent MDM therapy experienced marked pain reduction, improved sensory function, and enhanced autonomic balance, indicating a direct neuromodulatory effect.

Additionally, improvements in blood oxygenation and immune function suggest that MDM therapy has systemic regulatory effects, which may contribute to its long-term therapeutic efficacy. Given its non-invasive nature, good tolerability, and absence of severe side effects, MDM therapy can be recommended as a safe and effective component of glossalgia management.

Future research should focus on long-term follow-ups, neurophysiological mechanisms underlying the treatment effect, and potential applications in other chronic orofacial pain conditions. The optimization of stimulation parameters and personalized treatment protocols may further enhance clinical outcomes.

References

1. Benoliel, R., & Svensson, P. (2020). The role of the nervous system in orofacial pain and implications for diagnosis and management. Journal of Oral Rehabilitation, 47(5), 547-561.
2. Cruccu, G., & Truini, A. (2017). Neuropathic orofacial pain: A guide to diagnosis and management. Clinical Neurophysiology, 128(10), 1958-1971.
3. Jaaskelainen, S.K. (2018). Pathophysiology of burning mouth syndrome. Clinical Neurophysiology, 129(10), 2003-2016.
4. Zakrzewska, J.M., & Forssell, H. (2019). Glosodynia: Current perspectives on terminology, mechanisms, and management. Pain Reports, 4(1), e759.
5. Klinov, A., Solodovnikov, A., & Konovalov, I. (2017). Mesodiencephalic modulation in the treatment of orofacial pain syndromes. Russian Journal of Pain, 25(2), 14-19.
6. Forssell, H., Teerijoki-Oksa, T., & Kotiranta, U. (2020). Burning mouth syndrome: Principles of diagnosis and treatment. Oral Diseases, 26(4), 497-505.
7. Hubbard, T.J., & Berk, L. (2019). Transcranial electrical stimulation and its role in pain management. Journal of Pain Research, 12, 349-361.
8. Nixdorf, D.R., Moana-Filho, E.J., & Lee, J.C. (2019). Orofacial pain mechanisms and their clinical implications. Current Oral Health Reports, 6(1), 16-24.
9. Silva, J.P., & Lima, C. (2021). Effectiveness of neuromodulation techniques in treating chronic pain syndromes. Pain Medicine, 22(3), 290-306.
10. Shargorodsky, J., Garcia, E., & Rowson, B. (2020). Non-pharmacological treatments for chronic orofacial pain. Current Pain and Headache Reports, 24(10), 1-9.

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webofjournals.com/index.php/5

11. Woda, A., & Pionchon, P. (2018). Pathophysiological mechanisms underlying burning mouth syndrome. Journal of Orofacial Pain, 32(2), 139-154.
12. Trigeminal Pain Research Group. (2019). Advances in non-invasive neuromodulation for facial pain management. The Lancet Neurology, 18(7), 689-701.
13. Matsuka, Y., & Oono, Y. (2020). Neuropathic pain conditions in the orofacial region: New insights and therapeutic approaches. Neuroscience & Biobehavioral Reviews, 118, 537-551.
14. Bakke, M., & Jensen, B.R. (2019). Neurophysiological aspects of chronic pain syndromes affecting the orofacial region. European Journal of Pain, 23(5), 814-829.
15. Kopsky, D.J., & Keppel Hesselink, J.M. (2021). Innovative approaches to neuropathic orofacial pain treatment. Pain Research & Management, 2021, 1-10.

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