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OPTIMIZATION OF LOCAL TREATMENT METHODS FOR ORAL PAIN SYNDROMES IN POSTMENOPAUSAL WOMEN

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Abstract
The study examines the optimization of local treatment methods for oral pain syndromes in postmenopausal women, focusing on Burning Mouth Syndrome (BMS) as a prevalent neuropathic condition. The research analyzes key pathogenic mechanisms, including estrogen deficiency-induced alterations in salivary composition, small-fiber neuropathy, and dysfunction of trigeminal nociceptive pathways. The role of psychological comorbidities, such as anxiety and depression, in modulating pain perception is considered.
A targeted approach to local therapy is proposed, incorporating topical anesthetics, neuroprotective agents, and saliva substitutes. The impact of correcting mucosal irritation caused by dental factors is evaluated. The findings support the necessity of a multidisciplinary treatment model integrating dental, neurological, and endocrinological interventions to improve therapeutic efficacy and patient outcomes.

Keywords: Burning Mouth Syndrome, postmenopause, neuropathic pain, local therapy, estrogen deficiency, salivary dysfunction, trigeminal nerve, small-fiber neuropathy, oral pain management, psychological comorbidities, multidisciplinary treatment.

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Introduction

Burning Mouth Syndrome (BMS) is a chronic neuropathic disorder characterized by persistent oral pain in the absence of clinically detectable mucosal pathology. The condition predominantly affects postmenopausal women, with prevalence estimates ranging from 0.7% to 4.6%. The underlying mechanisms involve estrogen deficiency, alterations in salivary composition, and dysfunction of peripheral and central nociceptive pathways. Small-fiber neuropathy and increased excitability of trigeminal sensory neurons are implicated in the maintenance of chronic pain. Comorbid anxiety and depressive disorders further modulate pain perception and treatment outcomes.

The absence of standardized diagnostic criteria and effective treatment protocols complicates clinical management. Local therapeutic approaches targeting neuropathic components, salivary dysfunction, and mucosal integrity require further optimization. This study evaluates the efficacy of topical anesthetics, neuroprotective agents, saliva substitutes, and local dental interventions in postmenopausal women with BMS. The findings contribute to the development of an evidence-based strategy for improving symptom control and patient quality of life.

Burning Mouth Syndrome (BMS) is a chronic orofacial pain disorder characterized by a persistent burning sensation in the oral mucosa in the absence of visible pathological changes. BMS is most commonly observed in postmenopausal women, which is associated with hormonal changes occurring during this period [1].

The pathogenesis of BMS is multifaceted and includes neuropathic alterations such as small-fiber sensory neuropathy and axonal degeneration of nerve fibers in the tongue [2]. Hormonal changes in menopause, particularly a decline in estrogen levels, can lead to atrophic changes in the oral mucosa, contributing to the development of BMS symptoms [3]. Additionally, psychoemotional factors, including anxiety disorders and depression, are frequently associated with BMS and may exacerbate pain perception [4].

Optimization of local treatment methods for BMS in postmenopausal women requires a comprehensive approach that considers all aspects of pathogenesis. The

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use of topical anesthetics, neuroprotective agents, and saliva substitutes can help reduce pain intensity and improve patients' quality of life [5]. Correction of local irritating factors, such as sharp dental restorations or poorly fitting dentures, is also an essential component of therapy [6]. A multidisciplinary approach involving collaboration between dentists, neurologists, and endocrinologists is necessary to achieve optimal treatment outcomes [7].

Materials and Methods

The study was designed as a comparative cross-sectional analysis involving postmenopausal women diagnosed with Burning Mouth Syndrome (BMS) and a control group without oral pain syndromes. The study group included women aged 49 to 60 years with persistent burning sensations in the oral mucosa lasting more than three months and no visible pathological changes. The control group comprised women of the same age range without a history of oral pain syndromes. Exclusion criteria encompassed systemic conditions that could affect oral pain perception, including diabetes mellitus, psychiatric disorders, alcohol or drug abuse, and ongoing hormone replacement therapy.

Neurological and dental examinations were performed to assess nociceptive dysfunction and local mucosal factors. The intensity of pain was measured using the Visual Analogue Scale (VAS), and neuropathic pain components were identified through the Pain DETECT questionnaire. Psychological status was evaluated using the Hamilton Depression and Anxiety Scales. Salivary function was analyzed by measuring unstimulated and stimulated flow rates, pH levels, and electrolyte composition. MRI of the brain was performed to exclude structural neurological abnormalities.

Local treatment interventions included topical anesthetics, neuroprotective agents, saliva substitutes, and dental corrections. The therapeutic response was assessed over a three-month follow-up period based on changes in pain intensity, salivary function, and psychological parameters. Statistical analysis was conducted using parametric and non-parametric methods. The Student’s t-test was applied for normally distributed continuous variables, and the Mann–Whitney U test was used for non-normally distributed data. Categorical variables

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were analyzed with Pearson's chi-square test. Statistical significance was set at $p<0.05$.

The study was conducted in compliance with ethical standards and approved by the institutional ethics committee. Written informed consent was obtained from all participants before enrollment.

Results and Discussion

A clinical study was conducted involving 33 postmenopausal women diagnosed with Burning Mouth Syndrome (BMS), with an average age of 54.4 years. The duration of symptoms ranged from 2 to 5 years. A control group comprised 15 healthy postmenopausal women with an average age of 53.5 years.

The primary complaint among BMS patients was a burning sensation in the oral cavity, predominantly affecting the tongue (93.9%), lips (81.8%), gums (66.7%), and hard palate (60.6%). Notably, 75.8% of patients reported xerostomia, and 48.5% experienced dysgeusia. The Visual Analog Scale (VAS) indicated a median pain intensity of 9 out of 10, reflecting severe discomfort.

Psychological assessments revealed that 45.5% of BMS patients suffered from severe depression, while 42.4% experienced moderate anxiety, as measured by the Hamilton Depression and Anxiety Scales. Quality of life evaluations using the SF-36 questionnaire demonstrated significantly lower scores in physical functioning, social functioning, and mental health domains among BMS patients compared to controls.

Oral examinations identified local irritants in BMS patients, including periodontal disease (81.8%), decayed teeth or roots (72.7%), dental calculus (81.8%), and sharp edges of dental restorations (27.3%). These findings suggest that local oral factors may exacerbate BMS symptoms.

The study implemented a multidisciplinary treatment approach focusing on the elimination of local irritants, optimization of oral hygiene, and management of psychological factors. Interventions included dental cleanings, restorative dental work to address sharp edges, and the use of saliva substitutes to alleviate xerostomia. Additionally, patients received cognitive-behavioral therapy to address underlying anxiety and depression.

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Follow-up assessments over a six-month period indicated a significant reduction in pain intensity, with median VAS scores decreasing from 9 to 4. Improvements were also observed in psychological well-being and overall quality of life.

These results underscore the importance of a comprehensive, multidisciplinary approach in managing BMS in postmenopausal women. Addressing both local oral factors and psychological components is crucial for effective symptom relief and enhancement of patient quality of life.

Table 1. Clinical Characteristics and Treatment Outcomes in BMS Patients

Parameter	Baseline (n=33)	Post-Treatment (n=33)
Median VAS Pain Score	9	4
Patients with Severe Depression	45.5%	15.2%
Patients with Moderate Anxiety	42.4%	12.1%
Quality of Life (SF-36) - Physical Functioning	Significantly Lower than Controls	Improved to Comparable Levels
Quality of Life (SF-36) - Social Functioning	Significantly Lower than Controls	Improved to Comparable Levels
Quality of Life (SF-36) - Mental Health	Significantly Lower than Controls	Improved to Comparable Levels

Note: Post-treatment assessments were conducted six months after the initiation of the multidisciplinary intervention.

In conclusion, the integration of dental care, psychological support, and patient education forms the cornerstone of effective BMS management in postmenopausal women. Future research should explore the long-term benefits of such multidisciplinary approaches and investigate potential preventive strategies.

Conclusion

Burning Mouth Syndrome (BMS) presents a significant clinical challenge, particularly among postmenopausal women. The multifactorial etiology of BMS necessitates a comprehensive, multidisciplinary treatment approach. This study underscores the efficacy of combining local interventions—such as the elimination of oral irritants and optimization of oral hygiene—with psychological

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support to address associated anxiety and depression. Such an integrated strategy not only alleviates the primary symptoms of BMS but also enhances the overall quality of life for affected individuals. Future research should focus on long-term outcomes of these combined therapies and explore preventive measures tailored to this demographic.

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