



Acupuncture in the treatment of burning mouth syndrome

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Abstract

The burning mouth syndrome (BMS) is a chronic orofacial disease characterized by symptoms of burning or burning in the oral mucosa without being able to detect lesions or clinical change. Its etiology is multifactorial and affects mainly women in the postmenopausal periods. Treatment should be multi-disciplinary, but the complexity of the etiology knowledge hinders the establishment of the most appropriate treatment. Therefore, this study evaluated the use of acupuncture in the treatment of BMS. Through literature review, it can be noticed that the union of the concepts with the teachings of traditional Chinese medicine can provide a new perspective for the treatment of pain/oral burning as acupuncture treats the individual as a whole, in an attempt to restore the balance between the organs. Thus, various pharmacological effects can be achieved, such as analgesic, muscle relaxing, sedative, antidepressant, anti-inflammatory, repair stimulating, and immunity promoter, which might have a great efficacy in the treatment of BMS.

Introduction

Burning mouth syndrome (BMS) can be defined as a condition characterized by pain and burning sensation in the oral mucosa, without any detectable lesions or changes that justify it. The prevalence of this condition is primarily on women in periods of postmenopausal women above 50 years of age.^[1]

There are various potentially triggering factors of this disease, but its etiology remains unknown. Local, systemic, and psychogenic factors are cited among the main possible causes.^[2]

The complexity of the etiology knowledge hinders the establishment of the most appropriate treatment. The diagnosis must be made carefully, in addition to detailed history, tracing the psychological profile of the patient. According to ICHD-2, some of the diagnostic criteria may be persistent pain or burning in the mouth most of the day, mucosa with normal appearance, and exclusion of local and systemic diseases.

Treatment should be made individually, considering the etiological factors, often requiring an interdisciplinary

approach. Drug therapy is based on the factors that most affect the condition. These include tricyclic antidepressants, benzodiazepines, vitamin replacement, antifungal, anti-inflammatory, and hormone replacement therapy.^[3] Humphris, Longman, and field.^[4] show the importance of psychological approach in patients with BMS, investigating the possible psychological factors that influence pain. It is believed that this is an effective therapy.^[4] The BMS is a part of a complex pattern of somatic and psychological symptoms, with an interaction between physical and psychological causal factors.^[5]

As acupuncture is a therapeutic procedure where we may obtain different pharmacological effects of clinical importance such as analgesic, muscle relaxing, sedative, antidepressant, anti-inflammatory, repair stimulating and immunity promoter, it can have great efficacy in the treatment of BMS. Furthermore, in acupuncture treatment, the purpose is the normalization of ill organs by means of a functional support, which causes a therapeutic effect. This thinking is crucial to know the five

elements, which Chinese philosophy is based on. They derive from five sources of life, a quaternary surrounding the core of a polarized system: Positive and negative (a theory known as Yin-Yang).

The union of the concepts with the teachings of traditional Chinese medicine can provide a new perspective for the treatment of pain/oral burning. Thus, this study aims to evaluate the treatment of BMS with the use of acupuncture aiming to help a suitable treatment.

Literature Review

Concept

BMS is a complex disease characterized by the manifestation of symptoms of pain, stinging or burning sensation in the oral cavity and lips, without any sign of abnormality.^[6,7] BMS is referred to with different terms, such as: Glossodynia, glossopyrosis, stomatodynia, stomatopyrosis, oral dysesthesia, burning tongue and burning mouth, according to their location, type of sensation and extension in the oral mucosa.^[8]

The term syndrome is adopted due to the simultaneous presence of several symptoms such as dry mouth, altered taste, and burning sensation in the oral tissues.^[9] The International Association for the Study of Pain - defined it as "a burning pain in the tongue or other mucous membranes associated to signs and laboratory findings within the normal range for a period of at least 4-6 months."^[9]

Health professionals believe that emotions play an important role in most diseases and in the BMS when local or systemic factors cannot be held responsible for this complaint, psychogenic factors such as anxiety and depression may be responsible for the symptoms.^[10] Psychological states consistent with patients with chronic pain, such as anxiety or depression are not uncommon in cases of burning mouth, although there are doubts about the influence of these psychological conditions in the establishment of complaints.^[11]

Prevalence

This syndrome affects 3.7% of the population, according to an epidemiological study group with 1427 randomly selected individuals (669 men and 758 women) in a population of 48,500 Swedish subjects aged 20-69 years. Individuals who reported symptoms of BMS were examined clinically and 53 (3.7%) of them had a confirmed diagnosis, 11 (1.6%) men and 42 (5.5%) women.^[12]

The most prevalent age of patients with BMS is between 55 and 65 years old, affecting young adults between 30 and 40 years as well, and it rarely affects individuals under the age of 30 years. In children, there are no reports.^[13-16] The prevalence concerning gender was evaluated in a retrospective study of 140 patients with BMS, and it could be observed that in most cases, 135 (96.4%) patients were female and only 5 (3.6%), male.^[17]

Associated factors

Xerostomia, conceptualized as dry mouth, is a frequent complaint in patients with BMS.^[18] According to Klasser *et al.* (2008).^[18] and Brufau-Redondo *et al.* (2008),^[19] the prevalence of xerostomia associated with BMS affects approximately 34%-39% of the patients. Authors such as Gorsky *et al.* (1987),^[20] Grushka (1987)^[21] and Bergdahl and Bergdahl (1999),^[22] stated that approximately two-thirds of patients with BMS also complain of dry mouth.

Another aspect is related to candidiasis, which affects elderly individuals with immune deficiency, especially in prolonged use of antibiotics or corticosteroids. This infection can appear with or without inflammation on the mucosa and patients report burning sensation in the mouth, leading to fatigue and hypersalivation. Pain can appear due to incorrect use of orthodontic appliances, poorly adapted prosthesis or in a state of corrosion.^[23]

Though psychogenic factors are commonly debated about the relationship with BMS, studies suggest that these factors can play an important role in the pathogenesis of the syndrome and support the concept of multifactorial etiology, where the physical changes may interact with psychological factors.^[18,24]

The study by Cavalcanti *et al.* (2007)^[25] evaluated the relationship between BMS and prosthesis users. Among the 31 patients with the syndrome, 19 (61.3%) were users of removable dentures, which are in 14 (73.6%) cases, the prostheses were inadequate. After replacements or adjustments of the prostheses, 13 (68.4%) patients found no relief from complaints and one patient did not return. Nasri *et al.* (2007),^[26] also assessed the syndrome and observed in their study among users of dentures, 7 were denture wearers, and 17 used removable partial dentures, including 7 (30%) patients who reported as BMS precipitating event the removable prosthesis factor. Another factor is associated to deleterious habits such as clenching, bruxism, tongue thrusting, lip biting, compulsive movements of the tongue, and continuous prostheses friction.^[27] BMS holders have more nonspecific complaints of health and more severe symptoms of menopause compared to healthy subjects.^[21] The estrogen replacement therapy may not relieve symptoms of pain or burning, leading the authors to conclude that estrogen deficiency has no direct effect on the oral symptoms.^[21]

Acupuncture in the treatment of BMS

The mechanism of action of acupuncture is explained as an alteration in the bloodstream, changing the dynamics of regional movements from micro-dilatations, muscle relaxation, solving spasm, reducing inflammation and pain.^[28,29] As for neurophysiological aspects, the needles act on nerve fibers A-delta and C, triggering action potentials in the membrane, then the stimulation flows to the spinal cord and through a series of synapses it can establish reflex arcs, stimulate preganglionic neurons, and protrude by spinoreticular and spinothalamic tracts to the brain.^[30]

The acupuncture has been used as a therapeutic method for the treatment of BMS. Despite the difficulty of standardizing

the methodology, as it is a technique of oriental medicine, acupuncture can provide good results, however, multiple treatments are required during treatment and many patients tend to become dependent on therapy, which adds an important psychotherapeutic component.^[31]

Studies have shown that acupuncture causes a modulatory effect on the vases, and the stimulation by phototherapy has been reported for presenting analgesic effects and improving microcirculation. *In vivo* observations of the microcirculation revealed that the modification of the vascular pattern, with a decrease of arborescent ties and increased vascular density, promoted by acupuncture could result in vascular pattern compatible with the physiology of microcirculation and a consequent reduction of the symptoms of BMS.^[32]

The selection of acupuncture points should be based on the principles of anatomy, physiology, neurophysiology, and neuroanatomy of orthodox Western medicine, the ancient Yin and Yang Theory, five elements, Zang Fu and meridians of traditional Chinese medicine, named according to the Organization World Health, and so each patient should be assessed individually to establish the points to be used. The most common points were points belonging to the stomach meridian (E), large intestine (IG), kidney (R), liver (F), lung (P), and governing vessel (VG), being local systemic acupoints: E-3, E-4, E-5, E-6, E-7, IG-20, and VG-26; distal: R-3, R-7, F-3, E-36, LI-4, IG-11, VG-20; P-7 and R-6, and ear points: Shen-Men, central nervous system, nutritionally variant Streptococci, kidney, spleen/pancreas, and mouth.^[33]

Scardina *et al.*, 2010^[34] evaluated the use of acupuncture in reducing burning sensation to the oral influencing the microcirculation. 30 patients (10 male and 20 female, average age \pm standard deviation = 65.4 ± 2.17) were selected and then treated with acupuncture. Microcirculation was observed *in vivo* using videocapillaroscopy at three different times: t (0) in the absence of acupuncture; t (1) 1 min after the insertion of the needles; and T (2) 5 min after insertion of the needle and following their stimulation. The results showed the effect of acupuncture in the oral microcirculation, resulting in a significant variation in the vascular pattern that is associated with a significant reduction of the burning sensation after 3 weeks of treatment. Therefore, acupuncture can be a viable option in the treatment of the syndrome.

A systematic review was designed in 2012 by Yan *et al.*,^[35] to examine the effects of acupuncture therapy for BMS in clinical practice. The following databases contained relevant articles: Trials Cochrane Oral Health Group Register (July 2011), Cochrane Central Register of Controlled Trials (issue 7, 2011), MEDLINE (1966 to June 2011), and electronic medical database China-National Knowledge Infrastructure. The articles were selected and evaluated independently by two reviewers. Nine studies with 547 randomized patients were included in this review. The results showed that the use of acupuncture might benefit patients with BMS. Therefore, the evidence showed the efficacy of the therapy in reducing BMS pain and related symptoms.

The study of Sardella *et al.* In 2013^[36] investigated the use of acupuncture in a small group of patients with BMS. The group consisted of 10 patients (9 females and 1 male; range, 48-80 years). The pain and burning sensation were measured using a visual analog scale (VAS). Quality of life related to health was measured using the 36-item short-form health survey (SF-36). The acupuncture treatment lasted 8 weeks and consisted of 20 sessions. Patients reported an average pain reduction of 0.99 points in VAS, and it was not observed significant improvement in the overall score for quality of life, although individuals who received acupuncture treatment seemed better able to cope with their utterances.

In 2013, Brailo *et al.*^[37] evaluated whether the laser acupuncture is effective in treating patients with BMS. 16 participants were selected (2 men and 14 women); ages between 36 and 87 years (mean age 70.9 years). Symptom lasting 3-180 months (average 41.3 ± 63.7 months). The treatments consisted of eight laser acupuncture sessions, each lasting 15 min, every other day. The following points were discussed: The ST1 to ST3, ST4, ST5, LI4, LU7, GV14, CV17, SP10, SP9, and SP6. The laser wavelength was 660 nm, output power 50, the dose 1.5 2.0 J/cm (Medio Laser estate, Iskra Medical, Slovenia). The intensity was recorded by use of a VAS from 0 to 10 before and after treatment. All patients reported a reduction in the symptoms of burning according to the VAS scores.

Discussion

The number of clinical studies evaluating the use of acupuncture in the treatment of diseases and their symptoms is still limited, specifically directed to investigate the efficacy of this treatment for BMS.

In the concept of traditional Chinese medicine, the human body is made up of polarity, the union of two opposites that make up the balance by a mutual relationship, mutual control, and transmutation. This constant and continuous adjustment gives man the evolutionary basis of each individual.

After publishing the results of the women's health initiative, there was increased demand for alternative and complementary therapies by middle-aged women.^[25] In hormone therapy, combined use of estrogen and progestin can bring increased risk of breast cancer, coronary heart disease, thromboembolism, cerebral vascular accident (stroke), and dementia.^[38] Since then, hormonal therapies are less suitable, and, therefore, the demand for alternatives in relieving symptoms has increased.^[14]

The techniques used in the practice of acupuncture is also an important factor to be considered in the methodology undertaken, as it involves many variables such as selection of points; number of points; length of sessions; type of stimulation.^[30] The method of "placebo acupuncture" performed by superficial application of the needles and, in some cases, slightly apart from classical acupuncture points has been widely used in recent decades, especially in studies conducted in the 80's and 90's and is considered acceptable as control method by many authors. However, researchers found that the placebo

was not a reliable procedure to be used as a control, since studies have shown that the needles inserted superficially and even out of real acupuncture point, was able to promote sensory stimulation.^[39] As well as any allopathic treatment modality, acupuncture is not exempt from adverse effects, although when they occur, in most cases, they are considered transient and mild and usually restricted to sleepiness, the tiredness, and minor bleeding at the sites of insertion of needles. Adverse, moderate or severe effects, such as pneumothorax, local, and disseminated infections, among others, are directly related to the capacity and individual responsibility of professional practitioners, who are susceptible to negligence, recklessness, and errors inherent in the technique, not being different when any other technique where the professional is subject to the same is used.^[39]

Conclusion

Through literature review, it can be concluded that acupuncture may provide a new perspective for the treatment of pain/oral burning in cases of BMS, as acupuncture treats the individual as a whole.

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