



EFFECTS OF ACUPUNCTURE IN THE TREATMENT OF TEMPOROMANDIBULAR DYSFUNCTIONS

¹Evelyn de Freitas Boscaine, ¹Lirane da Silva Carneiro Suliano, ²Elenir Rose Jardim Cury Pontes, ²Daisilene Baena Castillo, ²Jaciara Lucena de Moraes, ^{2,*}Valdir Aragão do Nascimento

¹Federal University of Mato Grosso do Sul, 79070-900, Campo Grande, MS, Brazil

²Federal University of Paraná, 80. 060-000, Curitiba, PR, Brazil

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ABSTRACT

Temporomandibular dysfunctions (TMDs) are the non-dental pains that most affect the orofacial region, which are multifactorial and difficult to treat. Acupuncture is a therapy that has been used with great success in the treatment of TMDs, since it acts locally in muscle relaxation and pain control, seeking the physical, mental and emotional balance of the patient. Objective: To carry out a review of the literature, evaluating the results obtained in the researches that relate acupuncture as a treatment for temporomandibular joint pain, be it joint or muscular pain. Methodology: Literature review based on Pubmed, Scielo, Google School and temporomandibular dysfunction and acupuncture books, published from 1995 to 2016. As search engines the key words TMD, pain, acupuncture were used in English, Spanish and Portuguese.

Results: In this research 50 articles were found by database, however, the papers that focused on temporomandibular dysfunction as the main cause and acupuncture as a treatment option were selected. Of the total, only 31 articles were used for the literature review.

Conclusion: Acupuncture has been shown to be efficient in controlling orofacial pain and temporomandibular disorders.

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INTRODUCTION

Pain is characterized as an organic stimulus of the organism's response changes that impair its full functioning. However, depending on the intensity and duration of pain, it can make it difficult to plan treatment that eliminates its etiological factor (Biasotto-gonzalez et. al, 2009). Temporomandibular dysfunction (TMD) is an orofacial pain that affects the soft and mineralized tissues of the head, face and neck, affects sensory and motor transmission in the trigeminal nervous system. TMD impairs the temporomandibular joint and associated structures (Smith *et al.*, 2007; Rosted, 2000). The temporomandibular joint (TMJ) is a real diarthrosis, and is one of the most complex joints of the animal kingdom due to the great diversification of movements that it makes possible. It consists of bony, muscular structures, joint capsule, synovial fluid, articular disc, vascularization and innervations

*Corresponding author: Valdir Aragão do Nascimento,
Federal University of Mato Grosso do Sul, 79070-900, Campo Grande, MS, Brazil.

(Barros, Rode, 1995). The pain is chronic or acute, is the main reason that leads the human being to seek medical-dental help for their relief. Temporomandibular disorder or dysfunction (TMD) has a multifactorial approach and its diagnosis requires much information and knowledge (BARROS, RODE, 1995). The dysfunctions are divided basically into two large groups, ie, joint dysfunctions and muscular dysfunctions. They currently have a high incidence and varying from 21. 5 to 51. 8%. Affecting all age groups, pain from the 15 to 30 years have causes of muscular origin, however, from the age of 40 the causes are of articular origin. It has a prevalence in women in a ratio of 5/1 (Donnarumma, Muzili, Ferreira, 2010; GRILLO *et al.*, 2015; Garbelotti *et al.*, 2016; Borin *et al.*, 2012; Araújo, Almeida, 2009). Because it is a multifactorial disease, it must be treated in a multidisciplinary way. The impact of pain on the patient's life is assessed by questions related to social prejudice, development of activities of daily living, family life and work. There is a consensus on the fact that chronic pain produces not only biological but also psychosocial effects (Oliveira *et al.*, 2003; Araújo, Almeida,

2009). The word acupuncture was created by the Jesuits when they returned from China to where they had been sent on mission. The Jesuits during the sixteenth century were the first to introduce the knowledge and practice of acupuncture in Europe. For the Chinese, acupuncture is only a small part of Traditional Chinese Medicine (TCM). Their conceptions are mainly focused on the study of the causative factors of the disease, how to treat it according to the stages of the evolution of the pathological process and the study of the forms of prevention, in which lies the whole philosophy and essence of the MTC (Branco *et al.*, 2005). Currently it is known that acupuncture has scientific foundations and that the insertion of needles at the appropriate points (acupoints) acts on the nociceptive receptors generating an electric action potential and a local inflammatory process, releasing Bradicina and Histamine that act in the control of pain, stress, anxiety and all other possible processes. (Branco *et al.*, 2005; Florian, Meirelles, Sousa, 2011; Bontempo, 2016). In 1974, shortly after returning from China, Dr. Michel Bresset, a professor at the Faculty of Dental Surgery in Paris, had the opportunity to make for the first time a demonstration for dentists of a canal treatment (Biopulpectomy) under acupuncture anesthesia. Since then acupuncture has been used in several countries in dental practice.

Conventional acupuncture can now be associated with other techniques such as electro stimulation and laser. Traditional Chinese Medicine can be used successfully in various surgical procedures, periodontal, restorative and in the control of pain and post-surgical complications (Barros, Rode, 1995; SMITH *et al.*, 2007). Several protocols are used to treat TMDs, the most used are the occlusal plate, mandibular exercises, massage, application of anti-inflammatory drugs and in extreme cases surgery. Since the 1970s acupuncture has been used in dentistry by Dr. OrleyDulcettiJúnior and in the analgesia of TMJ pain has been successfully practiced. (Barros, Rode, 1995). This literature review aims to expose the effects of treatment of temporomandibular joint dysfunctions with the use of acupuncture and to demonstrate the effect of acupuncture analgesia on joint pain. Although not a conventional treatment, acupuncture may be one of the methods used to relieve the pains of TMJ dysfunctions. This manuscript is a bibliographical research, covering the period from 1995 to 2016, using the keywords ATM, temporomandibular disorders and acupuncture. We selected research that correlated the application of acupuncture to TMJ treatment. In this research were also used books containing basic concepts of pain, physiology and anatomy of the temporomandibular joint, in addition to books of acupuncture and Chinese medicine. Articles and materials made available through the internet were used. (SciELO, Google Scholar, PubMed). In all the articles studied, it was found that there was a certain degree of improvement in the patients who used acupuncture as a TMD treatment, either of choice or alternative.

DISCUSSION

In the present study, it was verified that of the 31 articles selected only 1 article reported limited action of acupuncture in the treatment of temporomandibular joint dysfunction. Five articles used only acupuncture as a form of treatment. However, there were papers that used other forms of treatment such as occlusal plaques, occlusal adjustments or medications. All papers reported at least an improvement of up to 58% in

dysfunction pain. All papers used acupuncture as a form of treatment and obtained a satisfactory response. Acupuncture has contributed satisfactorily to dental treatments, once applied by duly qualified professionals, it does not present any side effects to the patient (Florian, Meirelles, Sousa, 2011; Okeson, 2008). Acupuncture may be indicated as the first treatment option when the patient is allergic or suffering serious adverse effects from drug use, in cases of liver or kidney function impairment, history of gastric bleeding or taking anti-inflammatory drugs, or elderly individuals who need to use many drugs (Garbelotti *et al.*, 2016; viana *et al.*, 2008). Because it presents fewer adverse effects, it allows greater safety to hypertensive, diabetic, cardiopathy, hemophiliacs, children, pregnant women (Viana *et al.*, 2008). Regarding temporomandibular disorders, the occlusal plaque has considerable efficacy in case of muscular tension. Plate therapy reduces muscle hyperactivity through peripheral changes originating from afferent impulse alteration that reduces muscle tension in the region in question. Acupuncture is an excellent treatment of patients with chronic facial pain resistant to conventional treatment (occlusal plaque, occlusal adjustment or drug therapy).

Comparative studies between the traditional method and acupuncture show very similar results between the two techniques in relation to pain relief and control (BRANCO *et al.*, 2005; Smith *et al.*, 2007; Florian, Meirelles, Sousa, 2011). Unlike the occlusal plaque, acupuncture acts through a central mechanism of inhibition of pain, involving tegmental blockage in the spinal cord. It then triggers the release of neuromodulators, such as endorphins and serotonin, which alter pain sensitivity through the central mechanism of analgesia (Branco *et al.*, 2005; Smith *et al.*, 2007; Florian, Meirelles, Sousa, 2011; Mcneill, 1997). Acupuncture can also be associated with other methods such as transcutaneous electrical stimulation (TENS). As muscular pain is one of the symptoms of TMD, the electroacupuncture technique can provoke pain relief and muscle relaxation and restore muscle function and reduce the severity of dysfunction. Acupuncture is an option for TMJ treatment because it produces increased local blood flow and the release of endogenous opioids that improve joint microcirculation and decrease pain (Florian; Souza *et al.*, 2011; Bontempo *et al.*, 2016). Currently, TMD treatment includes patient education, behavioral therapy, physiotherapy (ultrasound, transcutaneous electro-stimulation, laser, exercises, massage, mobilizations), acupuncture, speech therapy, myorelaxant plaque, occlusal adjustment, surgery and medication intervention.

Acupuncture has become increasingly popular and accepted in western countries because of its positive effects on the relief of acute and chronic pain. In patients with TMD it is effective in increasing the range of motion of the joint and by activating the release of serotonin, enkephalin and endorphin, thus providing relaxation of the masticatory muscles and decreasing pain (Branco *et al.*, 2005; Smith *et al.*, 2007). Acupuncture is an effective, economical method that causes few adverse effects of clinical relevance and can promote the reduction of salivation, nausea and postoperative pain, regulates homeostasis and immunodefensive and anti-inflammatory responses. (Navarro; Alayón; Fernández, 2012). The adverse effects of acupuncture are minimal, usually related to complaint of dizziness, nausea and in some cases transient erythema or increased pain in the first hours (Meirelles, Gonçalves, Souza, 2009). Nine patients with chronic painful

TMD, aged 22-45 years and orofacial pain of the Occlusion Discipline of the University of Araraquara in Brazil were submitted to treatment with auricular acupuncture. All patients were treated by single weekly sessions over three weeks. For traditional Chinese medicine, the ear has points that refer to the entire human body and this treatment has gained space in the West in recent years for being considered simple and effective in combating pain, illness, emotional factors, among other problems. Auricular acupuncture is a sensitive technique, which acts through different mechanisms of systemic acupuncture. According to neurophysiology, the afferent impulses of the auricular points project towards corresponding or adjacent neurons in the central nervous system. All patients reported improvement in chronic pain, decreased anxiety and emotional balance after treatment with auricular acupuncture (Bontempo; Melo; Pizzol Kede, Franco-Michelon, 2016).

Through this bibliographical review, it is noticed that in the selection of points for the penetration of the needles one must choose at least two points, according to Barros and Rode, 1995. One point at the site of pain and another at a distance. The most effective distance point is Ig. On the other hand, the local points vary greatly in the symptomatology. In the case of restricted pain points Id19, E2 and Ta21. In masseter muscle pain the points E7, E6 and Id18 can be used. For pains in the region of the temporal muscle, the points Ta23, Ta22, Ta20, Ta9, Ta8 and Ta7 are used. In pains irradiated to the cervical region, Id16, Id17, E12, Ta16 and Vb20 can be used. For a more effective and comprehensive treatment it is suggested the combination of several points involving the largest area of action possible. Electro acupuncture can also be used for chronic cases. The negative pole should be at the pain site and the positive pole at the distance point, with frequency from 2 to 5Hz. In general an acupuncture session per week is considered ideal for a good improvement of the painful condition, with at least four sessions (Branco *et al.*, 2005; SMITH *et al.*, 2007).

The auricle acupuncture can also be used with satisfactory results using semipermanent needles or seeds. In a study of 31 patients, in which 12 patients aged 14-68 years and with temporomandibular joint alterations found that 67.7% of the patients reported that the pain disappeared after acupuncture treatment. They used acupuncture with treatment of choice in temporomandibular dysfunction. Patients underwent at least three sessions per month at least 20 minutes in duration. The points were divided as follows: for emotional rebalancing, the points C7, Pc6, Id3, Vb20 and Ta23. For yin deficiency, the points Vc3, R3, R7, Vg4, Vg14, Ta17 and Ta21. For ascension of Spleen / Pancreas yang, points Vc12, Ta3, Ig4, Bp4 and Vg21. There is no standard clinical protocol for selecting the points used in each treatment. Unlike Western therapies, acupuncture is applied based on biopsychosocial data collected in the patient's anamnesis, specific for evaluation by Traditional Chinese Medicine (BRANCO *et al.*, 2005; SMITH *et al.*, 2007). The most used points in the treatment of temporomandibular dysfunction are Ta21, Id19, Vb2, Id8, E6, E7, in which they are located in the face; In a study carried out at the University of Piracicaba, Brazil (UNICAMP), in the years from 2013 to 2014, 20 women of age were treated with acupuncture and occlusal plaque. 18 to 45 years with temporomandibular dysfunction and pain in the TMJ region and without presenting chronic systemic diseases. For the 20 patients who underwent acupuncture treatment once a week for

at least 20 minutes, they used Ig4, Ig11, Id19, F2, Vg20, Vg21, Vb34, B2 and Vc23 points. According to this study, 75% of the patients reported no pain after acupuncture treatment and 53% of the patients reported improvements in chronic pain of temporomandibular dysfunction compared to those who used occlusal plaques (60%). For researchers, acupuncture applied once a week for at least 20 minutes and for a period of 10 sessions is as effective as treatment with occlusal plaque. In an anamnesis following the criteria of Traditional Chinese Medicine, the acupuncture points used were R7, F2, Vb34, Ta17, Vb20, Vb39 and Vb20 (Bontempo; Melo; Pizzol Kede, Franco-Michelon, 2016). According to TCM, the human being must be viewed and treated in an integral way in which he has a physical, mental, emotional, spiritual and indivisible origin. That is, the human being in this context is an integral and active part of their natural physical and psychosocial environment (VERA, 2013).

In an electromyographic evaluation of 40 20- to 40-year-old women diagnosed with TMD, a decrease in the electric potential of chewing muscles was observed after treatment with electro acupuncture. In this study, patients underwent treatment with 10 sessions of acupuncture with 20 minutes duration once a week, and after 10 weeks an electromyographic evaluation of the masseter and temporal muscles was performed, a decrease in the painful potential of the muscles was observed. The selected points were E7, E5, Ta17, extra point Tayang, Ig4 and extra point Yintang. In this study, after the acupuncture treatment, the resting electrical potential of the temporal muscles was observed, which provided a better balance between the masseter and temporal muscles, indicating a better TMD in the patients. The hyperactivity of chewing muscles corresponds to a large part of TMD etiology. The positive results with acupuncture can be attributed to its approach with focus on both the physical and emotional aspects present in the TMD. Some studies use private studies, others use fixed studies, but the ones most used in TMD are E6, E7, TA21, TA17, ID18, Taiyang/Yintang (local points) and IG4 (distance point) (Borin, Corrêa, Silva, Milanes, 2012; Souza *et al.*, 2014). In auriculotherapy the points recommended for the treatment of TMD are Shen-men points, SNV, TMD, triad of anxiety and kidney. However, additional points are suggested for each case, such as muscle relaxation, heart, lung for anxiety and sadness, liver, gallbladder and large intestine, also related to anger, decision making / courage and joy. Auriculotherapy acts by regulating the endocrine and immune system by neurohumoral transmission, strengthening the ability to fight the disease (Bontempo; Melo; Pizzol Kede, Franco-Michelon, 2016)

Conclusion

In this manuscript, it was observed that acupuncture has provided good results for the treatment of TMJ aches and pains, especially those located in the mastication muscles, appearing as a main option or as an adjunct to conventional treatments. The method is inexpensive, rapid application, immediate therapeutic effect, has no side effects and may still be associated with other therapies. Acupuncture is being highly requested for the treatment of TMDs, due to its neurochemical and physiological effects. Acupuncture has become an additional mechanism for the treatment of TMD due to its immediate effect and for presenting an anti-inflammatory response much studied by the scientific community. However, it is suggested that further research and

longitudinal studies be undertaken to address the topic in more depth. We know that acupuncture does not only treat TMD but the patient as a whole providing balance.

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