

# Awareness on acupuncture in the management of orofacial pain among dentists

K. Hemani<sup>1</sup>, Dhanraj Ganapathy<sup>2\*</sup>, Visalakshi Ramanathan<sup>2</sup>

## ABSTRACT

**Aim:** This study thus aims at understanding the knowledge among dentists regarding the use of acupuncture therapy in the management of orofacial pain. **Materials and Methods:** A cross-sectional observational study was conducted in Saveetha Institute of Medical and Technical Science, Chennai, Tamil Nadu, India. The study population comprised undergraduate dental students from all the years (1<sup>st</sup> year, 2<sup>nd</sup> year, 3<sup>rd</sup> year, final year, and interns), staff members and private dental practitioners. A detailed questionnaire containing questions pertaining to the demographic status along with questions related to the knowledge of the participant about the use of acupuncture in orofacial pain management was structured. The questionnaire was distributed to the participants and the answers were registered. The results were obtained after statistical analysis and interpreted. **Results:** Out of 350 only 90 participants were aware of the mechanism of acupuncture. Only 40 were aware of its use in acute and chronic pain management. Only 28 were aware of its use in neurological pain management and only 49 were aware of its use in TMD pain management. 34 participants felt that acupuncture has side effects and 40 only knew that the pain relief was permanent. 306 participants wanted to undergo training in acupuncture. 29 knew that acupuncture causes selective anesthesia in the region of pain. Moreover, 51 were willing to refer their patients with orofacial pain for acupuncture therapy. **Conclusion:** Awareness about the use of acupuncture in the management of orofacial pain has to be improved and dentists should be trained on those grounds to help manage orofacial pain.

**KEY WORDS:** Awareness, Acupuncture, Oro facial pain, Trigger points

## INTRODUCTION

Traditional Chinese Medicine (TCM) originated about 2000 years ago in the Warring States and the Qin and Han Dynasties is the theoretical guide and basis for the practice and development of contemporary TCM today. According to TCM, a concept of holism is that the human body is considered as an “organic whole” in which all the constituent parts are interconnected and they coordinate and interact with each other functionally, and with the external environment.<sup>[1]</sup> The pathological state of the body where both external and internal factors lead to occurrence and progression of the disease. The challenge is the exact diagnosis and correct treatment. According to TCM, the balance in a body can be maintained by regulating the Yin-Yang and qi-blood balance. The vital-qi, or life force, helps

to regulate the whole body system by circulating all over the body along fixed pathways called meridians. Acupuncture therapy stimulates certain points along meridians and allows the free flow of qi to promote qi-blood equilibrium. The host-pathogen interaction manifests the disease based on both the virulence of the invading pathogens and the host response.

The acupuncture therapy depends on the metaphysical concepts of qi and Yin-Yang balance and practice of western medicines based on anatomical, physiological, and biochemical evidence.

The qi or “de qi” refers to the transmission of a needling sensation along the meridians, when a needle is introduced, which is often described by the patients as soreness, numbness, fullness, warm sensations, or aching.<sup>[2]</sup> This is referred to as by the acupuncturists as a needle grasp sensation, which is key in achieving therapeutic efficacy. Previous studies have explained this needle grasp as a result of muscular contractions,<sup>[3]</sup>

### Access this article online

Website: [jprsolutions.info](http://jprsolutions.info)

ISSN: 0975-7619

<sup>1</sup>Department of Prosthodontics, Saveetha Dental College, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, Tamil Nadu, India, <sup>2</sup>Department of Prosthodontics, Saveetha Dental College, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, Tamil Nadu, India

\***Corresponding author:** Dhanraj Ganapathy, Department of Prosthodontics, Saveetha Dental College, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Saveetha Institute of Medical and Technical Sciences, Chennai - 600 077, Tamil Nadu, India. Phone: +91-9841504523. E-mail: [dhanrajmaganapathy@yahoo.co.in](mailto:dhanrajmaganapathy@yahoo.co.in)

Received on: 05-12-2018; Revised on: 07-01-2019; Accepted on: 10-02-2019

but it is also experienced in more superficial tissues where no skeletal muscle is present. Recent literature gives histological evidence through rat models to suggest that this sensation is due to collagen and elastic fibers tightening around the needle during needle manipulation.<sup>[4]</sup> It is also further explained that this mechanical coupling between the needle and soft tissue to be responsible for transducing mechanical signals into fibroblasts and other cells, with resultant therapeutic downstream effects.

TCM theory states that the location of acupuncture points along meridians which are unlike tangible anatomical structures such as blood vessels or nerve trunks. However, a high degree of correspondence was found between the location of acupuncture points and trigger points.<sup>[5]</sup> It is also proposed that stimulation of acupuncture points can relieve pain by causing “hyper-stimulation analgesia,” which can be explained by the concept of “gate control theory of pain.”<sup>[6]</sup> Acupuncture points stimulate A- $\delta$  and C afferent fibers that send signals to the spinal cord with local release of dynorphin and enkephalins<sup>[7]</sup> which when reaches the midbrain, both excitatory and inhibitory mediators are activated in the spinal cord.

Neurotransmitters such as serotonin, dopamine, and norepinephrine are produced causing pre- and post-synaptic inhibition of pain transmission. When the signals reach the hypothalamus and pituitary gland, adrenocorticotropic hormones and endorphins may be produced. This forms the basis of our current understanding of the analgesic effect of acupuncture although other therapeutic effects of acupuncture for the treatment of nausea, gastritis, asthma, and dysmenorrhea are yet to be fully explained. In the case of asthma, one of the therapeutic acupuncture points, BL13 Feishu, lies approximately 1.5 inches laterally to the level of the spinous process of vertebra T3. It was hypothesized that the location of BL13 Feishu corresponds roughly to the sympathetic ganglion at the level of T3, which sends postganglionic fibers to the pulmonary plexus and cardiac plexus.<sup>[8]</sup> However, the scientific basis behind many therapeutic effects of acupuncture remains to be elucidated.

The World Health Organization (WHO) in 1979 endorsed 43 symptoms and later in 1996 upgraded to 64 symptoms indicated to be treated by acupuncture. In the Geneva WHO 2003 report, pain in dentistry (including dental pain and temporomandibular dysfunction [TMD]), facial pain and post-operative pain were listed among the conditions for which acupuncture has been proven through controlled trials, to be an effective treatment.<sup>[9]</sup>

## MATERIALS AND METHODS

A cross-sectional observational study was conducted in Saveetha Institute of Medical and Technical Science,

Chennai, Tamil Nadu, India. The study population comprised 500 undergraduate dental students (1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, final year students, and interns), staff members and private dental practitioners. Ethical approval was obtained from the Institutional Ethical Committee. Written informed consent was obtained from each participant, and the anonymity of the participant was maintained throughout the study. All the students who were present and who gave written informed consent were included in the study.

A detailed questionnaire containing questions pertaining to the demographic status along with questions related to the knowledge of the participant about the use of acupuncture in orofacial pain management was structured. The questionnaire was distributed to the participants and the answers were registered. The results were obtained after statistical analysis and interpreted.

The questionnaire was as follows:

Name:

Age:

Designation:

1. Are you aware of the mechanism of acupuncture?  
Yes/No/Not sure
2. Are you aware that acupuncture can be effective in the management of acute pain?  
Yes/No/Not sure.
3. Are you aware that acupuncture can be effective in the management of chronic pain?  
Yes/No/Not sure
4. Are you aware that acupuncture can be effective in the management of neurological pain?  
Yes/No/Not sure
5. Are you aware that acupuncture can be effective in the management of TMD pain?  
Yes/No/Not sure
6. Do you think acupuncture has any side effects?  
Yes/No/Not sure
7. Are you aware that pain relief is permanent?  
Yes/No/Not sure
8. Are you willing to undergo training in acupuncture?  
Yes/No/Not sure
9. Are you aware that acupuncture can induce selective anesthesia in the region of pain?  
Yes/No/Not sure
10. Are you willing to prescribe acupuncture for your patients?  
Yes/No/Not sure

## RESULTS

A total of 500 participants who attended the questionnaire 230 were undergraduate students, 50 were postgraduate students, and 70 were practitioners.

When they were asked if they were aware of the mechanism of acupuncture, 90 said yes, 250 said no, and 10 were not sure. When they were asked if they were aware that acupuncture can be effective in the management of acute pain? 40 said yes, 286 said no, and 24 were not sure. When they were asked if they were aware that acupuncture can be effective in the management of chronic pain? 40 said yes, 301 said no, and 24 were not sure. When they were asked if they were aware that acupuncture can be effective in the management of neurological pain? 28 said yes, 309 said no, and 13 were not sure. When they were asked if they were aware that acupuncture can be effective in the management of TMD pain? 49 said yes, 266 said no, and 35 were not sure. When they were asked if they think acupuncture has any side effects? 34 said yes, 283 said no, and 33 were not sure. When they were asked if they were aware that acupuncture gives permanent pain relief? 40 said yes, 304 said no, and 6 were not sure. When they were asked if they were willing to undergo training in acupuncture? 306 said yes, 30 said no, and 14 were not sure. When they were asked if they knew that acupuncture can induce selective anesthesia in the region of pain? 29 said yes, 289 said no, and 32 were not sure. When they were asked if they would recommend acupuncture therapy for their patient? 51 said yes, 248 said no, and 51 were not sure.

## DISCUSSION

Out of 350, only 90 participants were aware of the mechanism of acupuncture. Only 40 were aware of its use in acute and chronic pain management. Only 28 were aware of its use in neurological pain management and only 49 were aware of its use in TMD pain management. 34 participants felt that acupuncture has side effects and 40 only knew that the pain relief was permanent. 306 participants wanted to undergo training in acupuncture. 29 knew that acupuncture causes selective anesthesia in the region of pain. Moreover, 51 were willing to refer their patients with orofacial pain for acupuncture therapy.

Since the orofacial region is complex and, therefore, pain can arise from many sources of head face and neck, the conditions pose a challenge to the clinician.

The orofacial pain classification as outlined by Okeson<sup>[10,11]</sup> is divided into physical (Axis 1) and psychological (Axis 2) conditions. Physical conditions comprise TMD, which include disorders of the temporomandibular joint (TMJ) and disorders of the musculoskeletal structures, neuropathic pains, which include trigeminal neuralgia (TN)<sup>[12]</sup> and continuous peripheral, centralized mediated pains, and neurovascular disorders like a migraine.

TMD has defined a number of clinical problems involving the masticatory muscles, the TMJ, and related structures<sup>[13]</sup> and is the most prevalent condition seeking treatment.<sup>[14,15]</sup> The patient may present with a generalized diffuse jaw ache, earache, toothache, facial pain, and/or a headache or general facial fullness or pressure. Treatment planning depends on various factors, including the chief complaint, medical history, presenting symptoms, examination, and diagnosis. Extensive research in this area has made diagnosis and therapy more clear today.

Disorders of the TMJ are a result of a disturbed disc-condyle relationship, disturbing the TMJ biomechanics. Osteoarthritic changes can originate in the TMJ articular surfaces and, when they are influenced by systemic disease, can become aggressive and progressive, such as in the case of polyarthritis.<sup>[16]</sup>

Myalgia caused due to muscle injury or strain is reported as dull aching pain. Common treatments recommended rest, hot or cold compresses, stretching exercises, and muscle relaxants. Myofascial pain (MFP) also presents as a dull, continuous aching pain of varying intensity. MFP produces pain on palpation that is local and may refer to other sites, as mapped out by Simons *et al.*<sup>[17]</sup> Trigger points can often be seen in MFP and may be localized to a tort band of muscle. In addition, trigger points are associated with decreased muscle length and, when stimulated, can result in a local twitch response.<sup>[18]</sup> Palpation of the trigger points should duplicate the patient's pain complaint, thus confirming the diagnosis. Blocking the source of the pain using a vapocoolant spray or local anesthetic injection can also provide a therapeutic diagnosis.

### Adjuvant Management of TMD

Home care: A successful home care program consists of resting the masticatory muscles by limiting jaw movements, parafunctional habit modification, emphasizing a soft diet, and moist heat, and/or ice therapy.<sup>[19]</sup> In addition, restricting the movements of the mandible facilitates healing and prevents further injury. Mostly for TMD muscle relaxants are being used.<sup>[20]</sup>

Acupuncture and TMD acupuncture have been an adjunct treatment modality for various orofacial pain disorders, of musculoskeletal origin. Acupuncture stimulates the acupuncture points to stimulate the flow of energy believed to be blocked. A study that focused on TMD showed reductions in pain and more importantly, a reduction in NSAID use in subjects who had been treated with traditional acupuncture.<sup>[21]</sup> Further research compared TCM including acupuncture to specialty care that included self-care, patient education, occlusal splint therapy, physical therapy, and psychosocial counseling and

found that the TCM had a significantly greater reduction in pain and psychosocially contributing factors.<sup>[22]</sup> The difference between acupuncture and traditional trigger point and injection therapy should be informed to patients due to the similarity of the procedures. Acupuncture appears to be a beneficial treatment in conjunction with traditional therapies for TMD and perhaps as an alternative to pharmacological treatment.

Godfrey and Morgan<sup>[23]</sup> showed that 60% of musculoskeletal pain patients had reduced pain, whether or not theoretically correct acupuncture points or non-theoretically correct points were used. In a more recent study, Bing *et al.*<sup>[24]</sup> compared the effect on convergent neurons in the trigeminal nucleus caudalis of acupuncture performed at the zusanli point and a non-acupuncture point as well as noxious thermal stimulation. The three different stimulations produced similar strong inhibitory effects on the C-fiber evoked responses of trigeminal convergent neurons, and these inhibitions were significantly reduced by systemic administration of naloxone. They concluded that some effects of acupuncture are sustained at least in part by DNIC and involve endogenous opioids. Conversely, Bing, *et al.*, in a follow-up study,<sup>[25]</sup> recorded activities of subnucleus reticularis dorsalis neurons in rats and monitored the effect of acupuncture performed at different classical Chinese locations, including zusanli, as well as a non-acupuncture point adjacent to zusanli. They found that the majority of neurons responded to stimulation of all acupuncture points and non-acupuncture points, particularly when the stimulation was applied to contralateral or midline of the body. Frontal/prefrontal and limbic brain structures play a role in acupuncture. Particularly, left-anterior regions of the brain and motivation circuitry constituents are involved, indicating positive affect and emotion-related memory processing accompanied by endocrinologic and autonomic functions as crucial components of acupuncture effects.<sup>[26]</sup> Furthermore, long before the introduction of acupuncture into the U.S., Travell and Simmons<sup>[27]</sup> recognized that referred pain might be relieved by stimulation of trigger points. Dry needling is very similar to inserting acupuncture needles in both acupuncture points and non-acupuncture points have been shown to be effective. Lewit<sup>[28]</sup> found that patients with chronic myofascial pain had good relief when dry needling was done.

## CONCLUSION

Awareness about the use of acupuncture in the management of orofacial pain has to be improved among dentists; furthermore, they need to be trained on those grounds to help manage orofacial pain conservatively.

## REFERENCES

1. Wong LB. Acupuncture in dentistry: Its possible role and application. *Proc Singapore Healthc* 2012;21:432-48.
2. Liu G, Akira H. Basic principle of TCM. In: Liu G, Akira H, editors. *Fundamentals of Acupuncture and Moxibustion*. Tianjin, China: Tianjin Science and Technology Translation and Publishing Corporation; 1994.
3. Gunn CC, Milbrandt WE. The neurological mechanism of needle grasp in acupuncture. *Am J Acupunct* 1977;5:115-20.
4. Langevin HM, Churchill DL, Cipolla MJ. Mechanical signalling through connective tissue: A mechanism for the therapeutic effect of acupuncture. *FASEB J* 2001;15:2275-82.
5. Melzack R, Stillwell DM, Fox EJ. Trigger points and acupuncture points for pain: Correlations and implications. *Pain* 1977;3:3-23.
6. Melzack R, Wall PD. Evolution of pain theory. *Int Anesthesiol Clin* 1970;8:3-34.
7. Stux G, Pomenranz B. *Acupuncture Textbook and Atlas*. Berlin: Springer-Verlag; 1987.
8. Cheng KJ. Neuroanatomical basis of acupuncture treatment for some common illness. *Acupunct Med* 2009;27:61-4.
9. World Health Organization. *Acupuncture: review and analysis of reports on controlled clinical trials*. World Health Organization; 2002 Dec 31.
10. Okeson JP. *Bell's Orofacial Pains. The Clinical Management of Orofacial Pain*. 6<sup>th</sup> ed. Carol Stream, IL: Quintessence Publishing Co., Inc.; 2005.
11. Okeson JP. The classification of orofacial pains. *Oral Maxillofac Surg Clin North Am* 2008;20:133-44, 5.
12. Chithralekha B. Types of pain and medical management in trigeminal neuralgia among South Indian population. *Drug Invent Today* 2018;10:11.
13. McNeill C. *Temporomandibular Disorders: Guidelines for Classification, Assessment, and Management*. 2<sup>nd</sup> ed. Chicago, IL: Quintessence Publishing Co., Inc.; 1993.
14. Dworkin SF. Temporomandibular disorder (TMD) pain-related disability found related to depression, nonspecific physical symptoms, and pain duration at 3 international sites. *J Evid Based Dent Pract* 2011;11:143-4.
15. Dworkin SF, Huggins KH, LeResche L, Von Korff M, Howard J, Truelove E, *et al.* Epidemiology of signs and symptoms in temporomandibular disorders: Clinical signs in cases and controls. *J Am Dent Assoc* 1990;120:273-81.
16. Romero-Reyes M, Uyanik JM. Orofacial pain management: Current perspectives. *J Pain Res* 2014;7:99-115.
17. Simons DG, Travel JG, Simons LS. *Myofascial Pain and Dysfunction: The Trigger Point Manual. Upper Half of Body*. 2<sup>nd</sup> ed. Atlanta, GA: Lippincott Williams and Wilkins; 1998.
18. Sanitá PV, Júnior FG. Myofascial pain syndrome as a contributing factor in patients with chronic headaches. *J Musculoskelet Pain* 2009;17:15-25.
19. Randolph CS, Greene CS, Moretti R, Forbes D, Perry HT. Conservative management of temporomandibular disorders: A posttreatment comparison between patients from a university clinic and from private practice. *Am J Orthod Dentofacial Orthop* 1990;98:77-82.
20. Sam P, Dhanraj M, Jain AR. Treatment of temporomandibular disorders-knowledge, attitude, and practice among general practicing dentists a survey. *Drug Invent Today* 2018;10:707-9.
21. Elder C, Ritenbaugh C, Aickin M, Hammerschlag R, Dworkin S, Mist S, *et al.* Reductions in pain medication use associated with traditional Chinese medicine for chronic pain. *Perm J* 2012;16:18-23.
22. Ritenbaugh C, Hammerschlag R, Calabrese C, Mist S, Aickin M, Sutherland E, *et al.* A pilot whole systems clinical trial of traditional Chinese medicine and naturopathic medicine for the treatment of temporomandibular disorders. *J Altern Complement Med* 2008;14:475-87.
23. Godfrey CM, Morgan P. A controlled trial of the theory of acupuncture in musculoskeletal pain. *J Rheumatol* 1978;5:121-4.

24. Bing Z, Villanueva L, Le Bars D. Acupuncture and diffuse noxious inhibitory controls: Naloxone-reversible depression of activities of trigeminal convergent neurons. *Neuroscience* 1990;37:809-18.
25. Bing Z, Villanueva L, Le Bars D. Acupuncture-evoked responses of subnucleus reticularis dorsalis neurons in the rat medulla. *Neuroscience* 1991;44:693-703.
26. Esch T, Guarna M, Bianchi E, Zhu W, Stefano GB. Commonalities in the central nervous system's involvement with complementary medical therapies: Limbic morphinergic processes. *Med Sci Monit* 2004;10:MS6-17.
27. Travell JG, Simons DG. *Myofascial Pain and Dysfunction: The Trigger Point Manual*. Baltimore: Williams and Wilkins; 1983.
28. Lewit K. The needle effect in the relief of myofascial pain. *Pain* 1979;6:83-90.

Source of support: Nil; Conflict of interest: None Declared