

A novel action of acupuncture in orofacial region: A Review

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Received 20 May April 2017, Accepted 25 July 2017, Available online 30 July 2017, Vol.5 (July/Aug 2017 issue)

Abstract

Oro-facial pain and temperomandibular dysfunction are deemed upon as multifaceted problems and can pose major therapeutic problem in dealing with them. Evidence from clinical studies suggests that acupuncture may be useful in the treatment of orofacial pain, temperomandibular dysfunction and related disorders otherwise resistant to conventional treatment modalities. Acupuncture is an ancient healing technique that has regained its lost popularity in the last two decades. The present paper attempts to review this forbidden procedure and its role in improving the quality of dental care provided to the patients especially in the management of orofacial pain, temperomandibular dysfunction, dental anxiety, gag reflex, xerostomia and trigeminal neuralgia.

Keywords: Orofacial pain, temperomandibular dysfunction, acupuncture.

Introduction

Acupuncture is an ancient healing procedure dating back to more than 3000 years in Chinese history.^{1,2} Literary meaning of acupuncture is “needle piercing”. Theorists of acupuncture therapy believe that every disease or symptom is caused by an imbalance of two opposing life forces, which flow through the meridians on which acupuncture points are located. By inserting needles into these points the imbalance created by two life forces can be corrected, much like a key unlocking a door.¹

Various studies on acupuncture have demonstrated that acupuncture analgesia is initiated by the stimulation of small afferent sensory nerve fibers that innervate the muscles. These then send impulses to the spinal cord and ultimately affect the midbrain and pituitary. As these centers are activated there is release of neurotransmitters such as endorphins, enkephalins and monoamines that block the pain message.³⁻⁵

This holistic method is now widely used as a supplementary/complimentary to the regular treatment modalities for numerous pain related conditions in head and neck region including atypical facial pain, trigeminal neuralgia, migraine headache, xerostomia, MPDS, Bell’s palsy, TMJ pain and dysfunction, sinusitis, management of Gag reflex, enhance the effect of local anesthesia and so on.⁶⁻¹¹

Pain is defined as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage”.¹²

The pain persisting beyond a reasonable time period is designated as chronic pain. The reason of chronic pain often remains undiscovered and may result in ineffective management. Among the most common chronic pain conditions is orofacial pain and temperomandibular dysfunction. Chronic orofacial pain affects approximately 10% of adults and up to 50% of the elderly.¹³

The management of orofacial pain and dysfunction can yet times be frustrating. Analgesics, antianxiety and antidepressants form the mainstay for management of orofacial pain and related disorders.¹⁴ However; the drugs used are associated with untoward side-effects, such as nausea, vomiting, gastritis, peptic ulcerations, pruritis, sedation, dizziness, and decreased gut motility. Therefore use of adjuvant treatment methods such as behavioral, cognitive, exercise, relaxation, acupuncture and physical modalities that provide sparing effects and decrease the incidence of analgesic-related side-effects can be useful.^{14,15} Acupuncture, an integral part of traditional Chinese medicine, is a well-known and widely employed procedure for pain and other conditions.^{1,16,17} Acupuncture has stood the test of times for more than 2000 years and has proven its efficacy in management and modulation of many diseases affecting human kind.¹ Utility of acupuncture in the management of pain and related disorders is now well established. There have been increasing numbers of clinical trials evaluating the efficacy of acupuncture technique as an adjuvant method for orofacial pain, temperomandibular dysfunction, depression, xerostomia, gag reflex, intra and post operative pain, headache, migraine, bell’s palsy and trigeminal neuralgia.^{2,6-11,16-18}

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The core of this traditional healing procedure is based on the fact that health and illness hinges on the concept of 'vital energy'. The flow and distribution of this vital energy within its path is known as 'meridians'. The meridians are associated with major nerve and arterial pathways, joints, and facial planes. Traditionally acupuncture is accomplished by inserting slender needles into appropriate points and stimulating certain areas along these meridians.^{1,17} These areas are called as 'acupoints'. Acupuncture needles are much finer than hypodermic syringe needles and are solid rather than hollow.

Acupuncture Needles

Acupuncture needles are typically made of stainless steel wire. They are usually disposable sterile involves minimal risk of infection. Needles vary in length between 13 and 130 mm (0.51-5.1 inch), with shorter needles used near the face and eyes, and longer needles in more fleshy areas; needle diameters vary from 0.16 mm (0.006 inch) to 0.46 mm (0.018 inch) with thicker needles used on more robust patients. Thinner needles may be flexible and require tubes for insertion. The tip of the needle should not be made too sharp to prevent breakage, although blunt needles cause more pain. Apart from the usual filiform needle, there are also other needle types, which can be utilized, such as three-edged needles and the nine ancient needles.¹⁹

Needling Technique

The skin is sterilized with alcohol and the needles are inserted, frequently with a plastic guide tube. Needles may be manipulated in various ways, e.g. spun, flicked, or moved up and down relative to the skin. Since most pain is felt in the superficial layers of the skin, a quick insertion of the needle is recommended. The skill level of the acupuncturist may influence how painful the needle insertion is, and sufficiently skilled practitioner may be able to insert the needles without causing any pain.

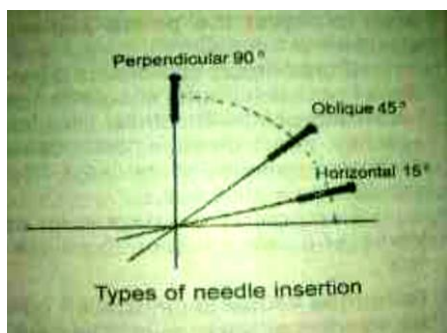


Table 1 Acupuncture points used in dentistry

Ex 1	Frontal sinusitis, Trigeminal neuralgia, headaches
Ex 2	TMJ dysfunction, Trigeminal neuralgia

Ex 3	Sinusitis, headaches, trigeminal neuralgia (V1)
ST 2	Maxillary sinusitis, trigeminal neuralgia (V2)
ST 3	To enhance LA effect
ST 4	Maxillary sinusitis
ST 5	Trigeminal neuralgia (V3), xerostomia, Facial pain
ST 6	Xerostomia, Facial pain, Trigeminal neuralgia (V3)
ST 7	Temporal headache, TMJ dysfunction
ST 19	Gag reflex, Trigeminal neuralgia, Facial pain
CV 24	Xerostomia, Gag reflex
GB 14	Frontal sinusitis, Headache

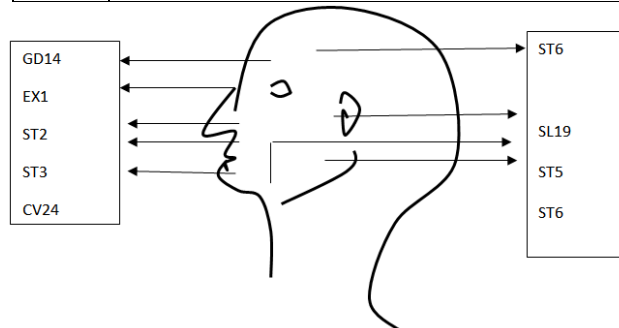


Fig.1: Showing various acupoints on the facial region

The mechanism of acupuncture analgesia achieved still remains unclear, however various proposed mechanisms include activation of the endogenous pain inhibitory system, release of endogenous opioids including β -endorphins, enkephalins, and dynorphins, and non-opioid substances such as serotonin, norepinephrine, and GABA.^{3-5,17} Acupuncture for orofacial pain and facial paralysis works through stimulation of cranial nerve primarily the trigeminal and facial nerves, respectively. In treating xerostomia, needles stimulate parasympathetic function.¹⁸ In treating craniomandibular pain acupuncture targets sensitive spots primarily in the muscles of mastication.

Temperomandibular-masticatory complex constitutes temperomandibular joint, masticatory system including muscles and dentition. The disorders associated with this complex constitute the second most common cause of pain in the oro-facial region only next to odontogenic.¹⁴ Large populations of patients developing signs of TMDs seek care at some point of time during the course of disease. At the same time diagnosis and management of TMD disorders can pose a challenge to even an experienced clinician. The focus of management of these disorders is on gradual shift from conventional aggressive therapies to a more conservative mode with emphasis on counseling, behavioral modification, correction of occlusal imbalances and physical therapies.¹⁴

Anxiety related to dental treatment is a common phenomenon that has a significant impact on the provision of rendering appropriate dental care to the patients. Anxiety related to dental problems and subsequent treatment still remain a challenge for many practitioners and pose real time problem in managing anxious patients. Acupuncture performed prior to dental procedure can have a beneficial effect on the level of anxiety in patients with dental anxiety and may offer a

simple and an inexpensive modality of management of anxiety and stress related to dental treatment.¹⁰ Y Sun et al conducted a meta-analysis and found that acupuncture and related techniques were effective in the management of postoperative pain which was demonstrated by a significant reduction of postoperative pain scores and opioid consumption by the patients.²

Gag reflex is a normal physiologic protective mechanism to prevent entry of foreign material into the pharynx or trachea. Few patients can have an exaggerated gag reflex mechanism which can cause problem while delivering dental treatment to the patients and can be an obstacle for acceptance of dental treatment by the patient as well.¹¹ Acupuncture has proved to be effective method in controlling severe gag reflex during delivery of dental treatment including impression taking or placing intra oral radiographs.^{9,11}

Trigeminal Neuralgia (TN)

TN is a neuropathic disorder characterized by episodes of intense pain in face, originating from the trigeminal nerve. According to the international association for the study of pain defines TN as "sudden usually unilateral brief stabbing recurrent pain in the distribution of one or more branches of the fifth cranial nerve. Auricular acupuncture points were also used. By inserting acupuncture needles in well-defined points, it is possible to restore the free flow of energy and the patient is cured.¹⁹

Xerostomia

Xerostomia (dry mouth) decrease in or total lack of saliva is a serious condition affects approximately 40% of adults over . For xerostomia patient's quality of life is often impaired profoundly. Etiology is multifactorial medications especially opioids, diuretics, anticholinergic antihistamines, endocrine disorders, autoimmune disorders and radiation therapy. Symptoms include rampant caries. Oral mucosal infections, difficulty in eating, speaking and swallowing, altered taste sensation and difficulty in wearing dentures. Acupoints were selected according to the principles of TCM. After acupuncture treatment patients with xerostomia increases the salivary flow rate.¹⁹

Temporomandibular Disorders (TMDs)

TMDs is a term which includes a group of conditions that affect temporomandibular joint (TMJ), the muscles of mastication and the associated head and neck musculoskeletal structures.⁸ Effective treatments for TMJ disorder is difficult to achieve since the condition is related to a variety of aspects of both the mind and body. It also helps in muscle relaxation and reduces muscle spasms. Relaxing the lateral pterygoid muscles can reduce the anterior displacing force on the meniscus of TMJ and help to minimize TMJ clicking.

Bell's Palsy

Bell's palsy is an idiopathic, acute peripheral-nerve palsy involving the facial nerve which supplies all the muscles of facial expression. Patients with Bell's palsy typically complain of weakness or complete paralysis of all the muscles on one side of the face. The facial creases and nasolabial fold disappear, the forehead unfurrows, corner of the mouth droops, eyelids will not close and lower eyelid sags. On attempted closure, the eye rolls upwards (Bell's phenomenon). Eye irritation often results from a lack of lubrication and constant exposure. Tear production decreases. Food and saliva can pool in the affected side of the mouth and may spill out from the corner. Acupuncture helps in the treatment of Bell's palsy by reducing inflammation, by promoting the release of vascular and immunomodulatory factors. Enhancing local microcirculation, by increasing the diameter and blood flow velocity of peripheral arterioles. Increase the excitability of nerves and to promote the regeneration of nerve fibers.

Gag Reflex

Gagging has been defined as an ejector contraction of the muscles of the pharyngeal sphincter. It is a normal protective reflex designed to protect the airway and remove irritant material from the posterior oropharynx and the upper gastrointestinal tract. Its causes can be somatic, brought about by stimulating certain trigger areas in the oral cavity or psychogenic, which is induced by thought stimulus modulated by higher brain centers. Hyperactive gag reflex can be a hindrance to dental procedures, such as taking of alginate impression for denture fabrication. Auricular acupuncture has also been suggested for treating severe gag reflex and the role of acupuncture as a method of controlling the gag reflex is safe and quick.

Lichen Planus

Lichen planus is a common chronic immunological inflammatory mucocutaneous disorder that varies in appearance from keratotic (reticular or plaque) to erythematous and ulcerative. Exact etiology is unknown psychological stress, increased anxiety, immunological disturbances, infections and genetic predisposition.¹⁹

Advantages

1. Acupuncture is a non-invasive treatment.
2. Almost all patients or people in discomfort can undergo acupuncture treatment.
3. It provides relief to the patient from physical as well as mental ailments.
4. In an attempt to eliminate the root causes of a health problem, the treatment examines the entire human body and its relation to the environment.

5. Acupuncture is one of the most natural forms of alternative medicine during which endorphins are released into the blood stream in order to achieve maximum pain relief.
6. The treatment helps remove toxins and helps fast healing, because it increases blood flow, when the needles are inserted into the strategic locations of the human body.
7. Since acupuncture works on the vital energy (Qi) points of the body, it restores and maintains the overall health

Disadvantages

1. Acupuncture is safe only when it is performed by a trained and licensed acupuncturist
2. The needles for the treatment should be non-toxic and used only once. They should be properly labeled and sealed. The patient may suffer from various infectious diseases if the needles are re-used or not sterile.
3. Improper placement of the needle can lead to bleeding, swelling and painful sensation and infection in the acupunctured areas of the body.
4. Acupuncture is not recommended for damaged body parts, such as broken bones.
5. The treatment is not recommended for people suffering from bleeding disorders and patients on blood thinners.
6. Patients could experience a little amount of soreness post-treatment

Conclusion

Given the complexity of orofacial pain and related disorders, it is imperative to seek a multidisciplinary approach in dealing with the problems. Acupuncture can serve as a safe alternative to conventional treatment modalities. The efficacy of acupuncture in the management of temporomandibular dysfunction syndrome and oro-facial pain has been well documented and supported by various studies. Yes, acupuncture works in certain clinical situations otherwise resistant to conventional methods. Done accurately by an expert it is a wonderful alternative treatment for many pain related conditions of head and neck. In the light of current research it can be concluded that acupuncture can act as an adjuvant or supplement the conventional therapy in the management of orofacial pain and related disorders.

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