

Review Article

Impact of acupuncture in dental and orofacial pain

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ABSTRACT

Orofacial pain is one of the most worst sensory and emotion experience that disturbs the quality of life of a person. Acupuncture is an alternative reliable non-pharmacological complementary therapy without any side effect that helps in pain reduction. It has positive impact when given to patients for reliving dental and orofacial pain. Successful use acupuncture's for various dental and orofacial pain has been proven in various medical literatures. This integrated review focuses on various painful conditions in orofacial region which can be relieved by acupuncture. Application of acupuncture to reduce numerous painful conditions along with other associated problems like dry mouth, gag reflex, muscle spasm and temporomandibular joint dysfunction is taken into consideration. It is noted that acupuncture plays a significant role in complementing conventional treatment modalities in certain orofacial conditions.

Keywords: Acupuncture, dental pain, gag reflex, orofacial pain, xerostomia

Introduction

The term acupuncture derived from Latin word "acus" that means needle and "puncture" means insertion.¹ Chinese traditional medicine defines acupuncture as the stimulation of certain points on the surface of the human body through a technique of point stimulation with or without the insertion of needles. These include the use of electrical, magnetic, light and sound energy, cupping and moxibustion, to normalize physiologic

functions and in treating various conditions of the human body.² Acupressure has been in practice of pain management since 2,500 years.³ It is one of the natural, form of therapy which works on applying pressure to specific points in our body. Dental pain initiates when the nerve becomes irritated by some external stimulus. A toothache can be sharp, dull, throbbing, pricking, lancinating type depending on various pathological conditions.⁴ Acupuncture is a broad terminology which also includes

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acupressure that is application of pressure at selected sites on the body, moxibustion, photo acupuncture, electro acupuncture and microsystem acupuncture such as ear, face, hand, and scalp acupuncture.

Dental and orofacial pain disturbs the quality of life of individual and its most complicated pain. Using your body's own pressure points is called acupressure, and it's an effective way of sending a signal to your body to activate its own defenses against ailments. Acupuncture is an effective to reduce dental anxiety.⁵

In few cases when local anesthetic injection may not work efficiently, like in case of irreversible pulpitis then acupuncture along with nerve block helps to increase the success of inferior alveolar nerve block.⁶ A study conducted in 2014 found that acupuncture was effective in reducing the nausea in patients before making the maxillary impression for denture wearer.⁷ Another study was found that acupuncture reduces pain during injection of local anesthetic in children.⁸

Mechanism of action for pain reduction

During acupuncture a very thin stainless steel needles are inserted into a particular region which then manipulated gently by hand or with light electrical stimulation. In acupressure these points are pressed with different pressure while in moxibustion these areas are warmed.⁹ It stimulates the nervous system, which alter its way of action by releasing natural painkillers, such as serotonin and endorphins in the nervous system.¹⁰ Acupuncture acts by regulating various physiologic functions that causes analgesia, modulating the limbic-paralimbic-neocortical network, increases local microcirculation and prevent the body from infections.

1. Dental pain

There are numerous dense nerve fiber bundles in dental pulp within the tooth root and the periodontium surrounding area. During stimulation of these nerve fibers caused by bacteria present in caries, gingivitis, and periodontitis leads pain. The role of acupuncture in dental pain is not removing the cause of the pain, but alternative addition in achieving pain relief. The National Institutes of Health Consensus Statement on Acupuncture of November of 1998, states that promising results have been shown for postoperative dental pain.¹¹ A systematic review by Ernst and Pittler¹² showed reduction in dental pain by acupuncture. This review included 16 controlled trials, most of which implied that acupuncture was effective in dental analgesia. Chapman et al¹³ found that the tooth pain threshold to electrical stimulation was significantly raised by acupuncture.

Acupuncture help in relieving dental pain by stimulating the nerves located in muscles and tissues, which release endorphins and other neurohumoral factors that causes change processing and perception of pain in the brain and spinal cord by increasing the release of adenosine, which has antinociceptive properties. It also reduces inflammatory process, by promoting release of vascular and immunomodulatory factors that increasing local microcirculation, which helps disperse swelling.¹⁴

2. Increases salivary flow

Johnstone PA et al¹⁵ and Furness et al¹⁶ found that acupuncture treatment may provide relief for pilocarpine-resistant xerostomia patients following radiotherapy for head and neck malignancies. The possible hypothesis is release of neuropeptides, affecting blood flow with anti-inflammatory properties and atrophic effects on the salivary gland acinic cells. Neuronal activation of the parasympathetic nerves increases salivary

secretion. Observational studies have demonstrated that acupuncture treatment may increase salivary flow in healthy volunteers.¹⁷

3. Dental anxiety and gag reflex

It is a normal protective reflex designed to protect the airway and remove irritant material from the posterior oropharynx and the upper gastrointestinal tract.¹⁸ During dental treatment gag reflex is very common. While placing x ray film intraoral for taking radiograph of maxillary posterior region gag reflex is most commonly encountered. Gag reflex also seen during impression taking of maxillary arch for oral prosthesis.¹⁹ 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.²⁰

4. Temporomandibular joint (TMJ) pain and temporomandibular disorder (TMD)

Acupuncture therapy helps to relieve the pain and discomfort associated with the conditions, arising from muscle origin. It is well established that acupuncture can help in muscle relaxation and reduce muscle spasms. But this is not helpful in eliminating the cause of TMD which is caused due to structural anomalies like disc displacement and degenerative changes. Relaxing the lateral pterygoid muscles can reduce the anterior displacing force on the meniscus of TMJ and help to minimize TMJ clicking. Raustia AM et al²¹ compared the efficacy of acupuncture with conventional treatment modalities in the management of TMD and found that both the methods had positive effect. According to List et al²² acupuncture gave a better subjective result than the occlusal splint. Nineteen reports review suggests moderate evidence for acupuncture as an effective intervention to reduce TMDs symptoms.^{23,24}

5. Nerve pain (neuralgia, neuropathic pain, nerve injury)

Trigeminal neuralgia (TN) is a neuropathic disorder characterized by episodes of intense unilateral pain in face along the distribution of ophthalmic, maxillary and mandibular division of 5th cranial nerve. TN has trigger zone in facial regions. Carbamazepine, oxycarbamazepine, beclufen are main line of drugs for management of TN. Acupuncture helps to increase the excitability of nerves and to promote regeneration of nerve fibers.^{25,26} Case reports and case series in Chinese literature reveals it has a beneficial role on successful acupuncture treatment for patients with trigeminal neuralgia.^{27,28}

6. Anti inflammatory action

A review article by Zijlstra et al²⁹ suggested a hypothesis for the anti-inflammatory action of acupuncture. According to the authors, the insertion of acupuncture needles stimulates release of β -endorphins.

7. Chronic muscle pain or spasm

Myofascial pain is characterized by localized, myofascial trigger points in palpable bands of muscle fibers. These trigger points causes pain from muscle overload and sometimes due to trauma or repetitive activities that cause abnormal stress. Patients complain of tenderness, headaches, restricted movement of jaws, muscle stiffness, and difficulty in chewing hard food and yawning. Various studies by Park et al³⁰ and Shen et al³¹ showed the subjects who received six treatment sessions at two acuapoints with verum acupuncture experienced a significant reduction in jaw pain, neck pain, and had a increase in pain tolerance of the masseter muscle. This indicates effectiveness of acupuncture for myofascial pain of the jaw muscles.

8. Atypical facial pain

On provoking of few particular acupuncture points sensitivity to pain and stress is reduced in certain areas in brain.³² Certain point which is located in the middle of the 2nd metacarpal bone on the radial side helps for pain reduction in face and teeth.

9. Paresthesia or anesthesia of the oral and paraoral structures.

Rosted and Bundgaard³³ in 2003 reveals the induction time of a local anesthetic can be reduced if acupuncture is administered before injection. Acupuncture can act as synergistic for achieving anesthesia during dental procedures.³⁴ Crischina Branco Anna et al in clinical study noted pain remission and reduction in the size of the parenthesis area occurred after four sessions of acupuncture.³⁵ Bell's palsy is a unilateral, lower motor neuron facial paralysis of acute onset. Various randomized controlled trials have shown beneficial effects of acupuncture as an adjunctive treatment for Bell's palsy.^{36,37} Another review showed three studies involving 288 patients in total for Bell's palsy, that the therapeutic effect of acupuncture is better than that of medication or acupuncture combined with medication was superior than medication alone.³⁸

10. Headache (tension headache, migraine)

Acupuncture divides our body into different areas as pressure points. Acupuncture needles are inserted into particular regions those are in close proximity with nerves fibers. The needle stimulates the nerves to release hormones, such as endorphins, that trigger a response from your body. Diener HC et al in a randomized controlled trial ($n = 794$) showed that 11 acupuncture treatments given within a six-week period was at least as effective as a β -blocker taken daily over a six-month period.³⁹ Linde K et al controlled trial ($n = 302$) showed that acupuncture is more effective than no acupuncture.⁴⁰ Linde and colleagues found that there is consistent evidence that acupuncture is beneficial in the treatment of acute migraine attacks.^{41,42}

Table 1 showing the various advantages of acupuncture in orofacial pain and table 2 indicates the drawbacks of acupuncture.

Numerous studies have shown the benefits of acupuncture applied to multiple conditions affecting the head and neck, especially for chronic conditions such as myofascial pain and pain related to TMJ and neuralgias. Still many more studies and scientific evidence are needed which

Table 1: Advantages of Acupuncture

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| 1 | Natural and safe because it is nontoxic. Like other pharmacological modalities to relieve pain it does not cause any side effects. |
| 2 | No dependency and addiction |
| 3 | Simple and convenient if performed by a well-trained practitioner |
| 4 | Economical as it doesn't require a conventional dental setup. |
| 5 | Since acupuncture works on the vital energy points of the body, it restores and maintains the overall health |
| 6 | 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 |

Table 2: The drawbacks of acupuncture

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| 1 | More time consuming |
| 2 | Sometimes it fails to achieve about complete analgesia effect |
| 3 | Not suitable for children, because few children will tolerate the needling |
| 4 | Cannot be used effectively in needle-phobic patients |
| 5 | Acupuncture is not recommended for damaged body parts, such as broken bones |
| 6 | The treatment is not recommended for people suffering from bleeding disorders and patients on blood thinners |
| 7 | The needles for the treatment should be non-toxic and used only once. They should be properly labeled and sealed |

should empathies regarding acupuncture in reliving various dental and orofacial painful conditions.

Conclusion

Acupuncture does have a scientific background and the efficacy has been tested in a number of clinical trials. Acupressure could be a technical adjunct to reduce dental pain, and mental anxiety in the patients. Acupuncture is not without adverse effect and therefore proper training is essential. Follow up studies with large sample size should be conducted to see its outcome in treatment planning and acupuncture's applications in dentistry.

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