

# Acupuncture and Dentistry

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## Abstract

The article focuses on the pivotal role of acupuncture and its various types in the dental science specifically. There is scarcity of information on the role of acupuncture in dentistry, so this article bridges the gap. Acupuncture is a technique, originated in China, in which disease is treated by inserting needles at various points on the body - acupuncture points. The most common use of acupuncture is in pain management, for which a number of studies have shown it to be effective, particularly in the treatment of musculoskeletal pain. There have also been suggestions that acupuncture may enhance the immune response and reduce feelings of stress and anxiety induced due to dental procedures. Acupuncture in dentistry as an adjunct treatment for many conditions, has been practiced and researched in institutions throughout Asia and Europe for many decades. It is intended that acupuncture may play a promising role in certain dental conditions like facial pain, TMJ dysfunction, decreasing the level of anxiety and reducing gag reflex.

*Key Words: Acupuncture, TCM, Health, Oral health, CAM*

## Introduction

Acupuncture first originated in china about more than 3000 years ago [1]. It involves the insertion of needles into various parts of the body with aiming to cure diseases. Still it is being relied as an alternative or adjunct during various medical therapies and also in dentistry. Early studies state that acupuncture play role in treatment of several disorders where pain is the primary symptom such as in asthma, sensor-neural deafness, tinnitus, hypertension, psychiatric disorders, smoking addictions and obesity [2]. The efficacy of acupuncture is adequately demonstrated in case of post-operative and chemotherapy associated nausea and vomiting. Acupuncture has proved beneficial in treatment of heroin withdrawal and other addictions [3]. We feel however that serious consideration of this issue is beyond the scope of this paper. According to commonly held view of acupuncture it is a complicated technique involving ample knowledge of ancient Chinese philosophy whose action is basically a placebo effect and in any case of limited application to dentistry [4]. The use of acupuncture in dentistry has been cited by 2 authors who have concluded that acupuncture is effective in numerous conditions like TMD, Pain management and clinical conditions like Sjogren's syndrome [5-7]. As research works on Acupuncture have begun few decades back, there lies a hint of skepticism among the dental professionals for its use in various treatment procedures.

### Definition and types

Acupuncture, or needle puncture, is a European term coined by Willem Ten Rhyne, a Dutch physician who visited Nagasaki

in Japan in the early part of the seventeenth century.

The term "acupuncture" consists of two words from the

Latin: Acus: Needle and puncture: Insertion. The Chinese describe acupuncture by the character 'Chen', which literally means 'to prick with a needle', a graphic description of this therapeutic technique. The traditional Chinese medicine act in Singapore defines acupuncture as "the stimulation of a certain points on or near the surface of the human body through any technique of point stimulation (with or without the insertion of needles), including the use of electrical, magnetic, light, sound energy, cupping, moxibustion to normalize physiological functions or to treat ailments or conditions of the human body" [8]. This form of treatment involves the use of steel, silver or gold needles that are inserted into specific acupuncture points [9]. Varied techniques in acupuncture [2,6,9-14].

- 1) Traditional body acupuncture (Body needling)
- 2) Microsystems acupuncture such as ear acupuncture (Auricular), face, hand & scalp acupuncture.
- 3) Electro-acupuncture (electric acupuncture)
- 4) Trigger point acupuncture
- 5) Laser treatment (photo treatment)
- 6) Moxibustion
- 7) Acupressure (the application of pressure at specific sites).
- 8) Okibari - Japanese style

### Historical evidence

The history of Acupuncture in Traditional Chinese Medicine (TCM) can be traced back to the Warring States and the Qin and Han Dynasties more than 2000 years ago [15]. According to one explanation some soldiers were wounded by arrows in a battle who

were believed to have been cured of chronic afflictions that were otherwise untreated and there are variations on this idea [16,17]. The Chinese believe that the practice of acupuncture began during the Stone Age when stone knives or sharp edged tools, described by the character 'Bian', were used to puncture and drain abscesses. The ancient written record of acupuncture is found in the Huangdi Neijing (The Yellow Emperor's Inner Canon), dated approximately 200 BC [18]. Acupuncture originated in China and soon spread to Japan, the Korean peninsula in 6th century and to Vietnam and elsewhere in Asia in 8th and 10th century. Hieroglyphs and pictographs have been found dating from the Shang Dynasty {1600-1100 BCE (Before Common Era)}, which suggests that acupuncture was practiced along with Moxibustion. Even though acupuncture was introduced to Europe as long ago as the early 17th century by Jesuit missionaries, skepticism about its effectiveness continues to exist in countries where modern Western medicine is the foundation of health-care, especially in those where acupuncture has not yet been widely practiced [2,6,7,14,19].

### **Concept of acupuncture in Traditional Chinese Medicine (TCM)**

To understand the role of acupuncture therapy in TCM, we must first appreciate the fundamental treatment philosophies of TCM.

TCM believes in the concept of holism, whereby the human body is seen as an "organic whole" and all the constituent parts are inter-connected and they coordinate and interact with one another functionally, and with the external environment. The constitution of the body can be regulated by maintaining the yin-yang and qi-blood balance. The vital-qi, or life force, is what keeps the whole body system going. It circulates all over the body along designated pathways called meridians. Acupuncture therapy involves the stimulation of certain points along meridians to allow the free flow of qi. This promotes qi-blood equilibrium. The pathogenesis of disease based on TCM philosophy is summarized in Figure 1. This concept of a host pathogen interaction, whereby the manifestation of disease depends on both the virulence of the invading pathogens as well as the host response, can draw parallel with some of the modern concepts of disease progression in Western Medicine .

Traditional Chinese medicine also explains that the human body has thousands of nerve points or pressure points that control different parts of the body. These points are located along 14 major meridians or power lines inside the body. These power-lines carry energy or qi-chi which is distributed evenly in cases of health body. However in sickness or disease, an obstruction at a particular point affects the rest of the body. Needles clean out the obstruction and redirect energy into these affected parts. This will cure the problem over a period of time (Figure 1).

### **Acupuncture points and features**

Acupuncture points are areas of low electrical resistance and are regarded as energy concentrating points, comparable to electric batteries in which, up to a certain extent, physical energy is stored. The insertion of needles is made to the skin and muscle tissue which gets affected by every kind of stimulation during the application. The insertion of needles to acupuncture points activates the skin receptors that are

closely located. It has been proved that there is a close relationship between the location of acupuncture points and the receptors of the acupuncture points [20-22]. 70-80% at these acupuncture points is similar to the trigger points and most of the acupuncture points are also similar to muscular motor points [23]. There are various acupuncture points which play their part in dentistry such as body points, relevant trigger points and ear points.

The body points can be divided into 2 groups: General points & local points (Tables 1 and 2):

### **Mechanism of Action**

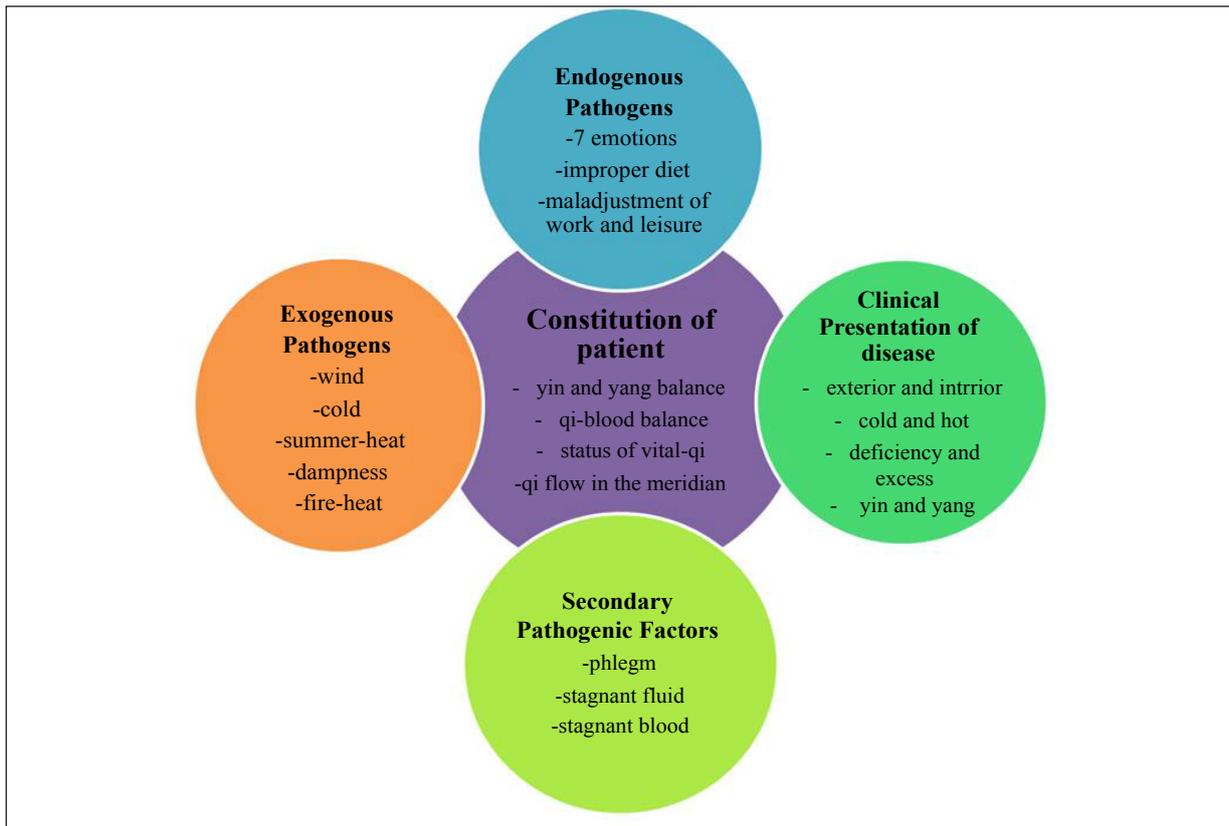
Acupuncture stimulates small myelinated nerve fibres in muscle, which send impulses to the spinal cord and then activate the midbrain and pituitary-hypothalamus. It has been proved that enkephalin, beta endorphin, dynorphin, serotonin and noradrenalin are involved in this process. It is well known that a painful stimulation will activate two types of nerve fibres in the peripheral nervous system: A-Delta fibres and C-fibres which primarily will terminate at the second layer of the black horn. From the second layer of the black horn, the pain sensation is via interneurons transmitted to the cortex and we will experience a pain [25].

Today it is generally accepted that insertion of a needle in an acupuncture point will create a small inflammatory process with release neurotransmitters such as bradykinin, histamine, etc. and subsequent stimulate A-Delta fibres located in the skin and muscle. The A-Delta fibres terminate in the second layer of the black horn and inhibit the incoming painful sensations by release of enkephaline. This segmental model is the simplest mode of action and accounts probably for the pain relieving effect of acupuncture in most cases [26]. From the second layer of the black horn, the A-Delta fibres continues to the fifth layer of the black horn, cross over to the opposite side and ascend via the spinothalamic tract to the mid brain where the raphe magnus nucleus is stimulated [27]. Raphe magnus nucleus is the main producer of serotonin on the brain and is believed to play a key role in acupuncture's mode of action. Thus, it has been demonstrated that serotonin is a pro-drug for endorphin which probably accounts for the central (extra-segmental) effect of acupuncture. Moreover, it has been shown that serotonin is a pro-drug for ACTH, which probably via the pituitary gland accounts for the increase of cortisol which has been shown after acupuncture and thus improves the immune system. Finally, Serotonin has a direct effect on the cortex and it is likely that the beneficial effect of acupuncture on stress and anxiety is because of this direct effect [28]. It has been suggested that the pituitary gland takes part in the production of endorphin but our knowledge at this level is very scanty.

### **Three paths for introduction of acupuncture into dental practice**

In traditional Chinese medicine, after the neuro-physiological research and well conducted clinical trials, acupuncture has gained some status in terms of alternative tool in various management of pain. Its introduction into dental practice has three paths-

1. As a variant of the old medical acronym TEETH (tried everything else, try homeopathy). That is when clinicians have exhausted all available therapeutic avenues;



*Figure 1. The pathogenesis of disease based on TCM philosophy.*

acupuncture is tried as a last resort. This is unfair both to the patient, in whom it may engender false hopes of a 'miracle', and the practitioner for whom repeated failure, may lead to abandonment of further study.

2. As a supplement to orthodox treatment where treatment modalities may be limited or ineffective. Clear examples are to suppress the gagging reflex during maxillary impression taking, the reduction in postoperative analgesic requirement in patients sensitive to them, reduction of time in the onset of local anesthesia and control of pre-operative anxiety (Figure 1). These involve simple acupuncture treatments with the insertion of few needles at recognized acupuncture points, which can be taught to any dentist as a short-postgraduate course.

3. As an adjunct to, or replacement of normal treatment modalities, for more complex conditions such as TMD or facial pain. Suitable examples are when the use of Non Steroid Anti-Inflammatory Drugs (NSAID's) is contraindicated because of concomitant systemic medication or gastric ulceration. These therapies require careful evaluation and a high level of expertise on the part of the practitioner, but postgraduate pathways do exist for this training within the UK.

Acupuncture has lots to offer in terms of pain management in dental practice. Although its use cannot replace drills used in dentistry, it has enormous potential in treating other ailments like TMJ pain, various types of oro-facial pain, muscle spasms, migraine, anxiety, dental fear, gag reflex, xerostomia [9,11,12,14].

### **Application of Acupuncture in Dentistry with Relevant Studies and their Outcomes**

#### **Management of dental pain, providing analgesic effect and post-operative pain relief**

A complex network of nerve fibres are found in dental pulp

within the tooth and the periodontium surrounding it and pain is quickly elicited when stimuli activate these nerve endings. The management of dental pain is to first identify and remove the cause (such as caries and gingival inflammation), followed by any analgesic medication if required. According to TCM theory, local acupuncture points on facial regions such as ST6, ST7 and distant points like LI4 can be used to treat dental pain. They belong to the stomach and large intestine meridians which converge at the facial region and link up with the maxillary and mandibular teeth, respectively. Western medical literature proposed that acupuncture can produce analgesic effect at a distant site by diffusing noxious inhibitory control [13]. This provides a possible explanation to how the acupuncture point LI4, which is located on the radial side of the second metacarpal bone on the dorsum of the hand, can elicit an analgesic effect on the oro-facial region.

The role of acupuncture in dentistry may not involve removing the cause of dental pain, but rather, as an adjunct in achieving anaesthesia during dental procedures as well as providing postoperative pain relief. Studies have shown that the onset time for regional anaesthesia after administration of prilocaine hydrochloride is around two minutes. A pilot study was conducted to investigate whether the induction time of local anesthetic can be reduced if acupuncture is given before injection [10,29]. The results showed that in the group where local acupuncture points SI19, ST5 and ST6 (within the innervations of the mandibular branch of the trigeminal nerve) were used before an inferior alveolar nerve block was given using prilocaine hydrochloride, the induction time was 62 seconds versus 119 seconds in the control group where only the nerve block was given. Findings from this study suggest that regional acupuncture can accelerate the induction time after an inferior alveolar nerve block.

**Table 1.** General points of the body.

<b>LI. 4</b>	Chinese name- He Gun ; English name-union valley
	Location: In the middle of the 2nd metacarpal bone on the radial side.
	Indications- Useful as a distal point for all conditions in the face. Excellent point for pain in face and teeth
<b>Ht 7</b>	Chinese name - Shen Men
	Location- At the Palmar flexion crease of the wrist, radial to the tendon of the Ulnar flexor muscle of the wrist.
	Indications- Best point to relax the patient
<b>PC. 6</b>	Chinese name- Nei Guan
	Location- 2 cun proximal to the palmar flexion crease of the wrist that lies proximal to the pisiform bone, between the tendons of the palmaris longus muscle and the radial flexor muscle of the wrist.
	Indications-Best point to be used when patient is suffering from vomiting and nausea.
<b>LR 3</b>	Chinese name – Taichong
	Location- This point is found on the dorsum of the foot between the 1st and 2nd metatarsals, approximately 2 cun from the margin of the web between the toes.
	Indication-Powerful point to relax the patient
	Point has general relaxing action on muscles.
<b>Gb. 34</b>	Chinese name- Yanglingquan
	Location- This point is found in a depression located antero-inferiorly to the head of the fibula.
	Indication- Used for general muscle relaxation
<b>LI. 11</b>	Chinese name -Qu Chi
	Location- At the lateral end of the transverse cubital crease midway between LU5 and the lateral Epicondyle of the Humerus.
	Indication-Used to improve the immune system
<b>TE. 3</b>	Chinese name- Zhong Zhu
	Location-This point is located in the groove formed by the tendons of the 4 <sup>th</sup> and 5 <sup>th</sup> fingers behind the knuckles.
	Indications-Distal point used in conditions related to ear

Several studies have shown that acupuncture can reduce postoperative pain. A systematic review of 16 studies suggests that acupuncture therapy can help to alleviate postoperative pain, although heterogeneity in the methodological details among the studies may limit the conclusions that could be drawn. Acupuncture therapy in alleviating postoperative pain may help to reduce the patients' dependence on systemic analgesic medications. The use of non-steroidal anti-inflammatory drugs for pain control is associated with increased risk of gastrointestinal complications like ulceration and bleeding [5,30]. A randomized placebo-controlled trial was conducted to evaluate the efficacy of acupuncture in treating postoperative oral surgery pain at the University of Maryland in Baltimore [31]. The treatment group that received real acupuncture treatment immediately after the surgical removal of impacted lower third molar had significantly longer pain-free postoperative time (172.9 minutes) compared to the placebo group (93.8 minutes), in which the subjects had plastic needles applied to the same locations without insertion into the skin.

Lao et al. in 1995 treated patients with acupuncture and placebo after removal of 3rd molars [32]. Subjects treated with acupuncture reported 181 minutes pain free time compared with 71 minutes in the placebo group. Lapeer GL in 1987 treated patients with acupuncture and nitrous oxide after removal of 3rd molars, but no difference was found between the two groups [33]. Ekblom et al. conducted a study on patients treated with acupuncture before or after procedure and patients who were conventionally treated [34]. Here, an increase of the intake of pain killers were found in both acupuncture groups compared with the untreated control group. Chapman et al. [35] in the year 1975 compared the effect of acupuncture with nitrous oxide with an untreated control group. It was found that both the nitrous oxide and

acupuncture groups were found to be significantly different from the control group. No difference was found between the two groups. Sung et al in 1977 allocated patients to either acupuncture, codeine or placebo treatment. Both acupuncture and codeine were found to reduce the pain compared with the placebo group [36].

More randomised controlled clinical trials to verify the role of acupuncture therapy in dental pain management, particularly in postoperative pain, may be necessary.

#### **Management of temporomandibular disorders and oro-facial pain**

Temporomandibular Disorders (TMDs) involves a group of conditions that affect the temporomandibular joint (TMJ), the muscles of mastication, and the associated head and neck musculoskeletal structures [37]. The Clinical Diagnostic Criteria for TMD was created to provide a standardized definition of diagnostic subgroups of patients with oro-facial pain and TMD [38]. It classifies the most common forms of TMD into the following: masticatory muscle disorder, TMJ internal derangement and TMJ degenerative joint disease.

While acupuncture therapy may not be helpful in treating TMD if caused due to structural anomalies like disc displacement and degenerative changes, it may aid in relieving pain and discomfort associated with the conditions, especially of muscular origin. It has been documented that acupuncture can help in muscle relaxation and reduce muscle spasms. Relaxing the lateral Pterygoid muscles can minimize the anterior displacing force on the meniscus of TMJ and help to alleviate TMJ clicking.

A systematic review of randomised controlled trials for assessing the efficacy of acupuncture for symptomatic cure of TMDs was conducted [39]. Nineteen reports were included and the review suggests moderate evidence for acupuncture as an effective intervention to reduce TMDs symptoms,

**Table 2.** Local points of the body.

<b>LI. 20</b>	Chinese name-Ying Xiang
	Location-In the nasolabial groove, level with the midpoint of the lateral border of the ala nasi.
	Indications-Used in all conditions involving the sinuses. Also useful in facial palsy and neuralgia in this part of the face Excellent for toothache.
<b>St 7</b>	Chinese name-Xiaguan
	Location -: With mouth closed, in the depression at the lower border of the Zygomatic arch, anterior to the Condylod process of the mandible.
	Uses -Alleviates Pain of Cheek And Facial Pain. Most effective in upper teeth and lower jaw.
<b>St 5</b>	Chinese name-Da Ying
	Location -Anterior to the angle of the mandible, on the anterior border of Masseter muscle, in the depression that appears when the cheek is bulged.
	Indication- Pain a/or swelling of the cheek/jaw, neck pain, lockjaw, toothache. ,Stiff tongue leading to speech problems, frequent yawning.
<b>St 2</b>	Chinese name-Si Bai
	Location: Below the pupil, in a depression at the infra-orbital foramen.
	Indication- Point of choice in maxillary sinusitis. Excellent for tooth ache
<b>Gb 20</b>	Chinese name-Feng Chi
	Location- In a depression between the upper portion of the Sterno-Cleidomastoid muscle and the Trapezius, level with GV 16
	Indication-Useful point in headache,migraine,eye problems, tinnitus,vertigo etc
<b>Si 19</b>	Chinese name-Ting Gong
	Location-Anterior to the tragus and posterior to the condyloid process of the mandible, in a depression formed when the mouth is opened.
	Indication-Useful in problems involving the Tempero-mandibular joint, tinnitus , vertigo etc
<b>Te. 21</b>	Chinese name- Ermen
	Location-On the face, anterior to the supratragic notch, in the depression behind the posterior border of the condyloid process of the mandible.
	Indication - Tinnitus, deafness, otitis media suppurativa, toothache.

although more studies of larger sample sizes are needed to investigate the long-term efficacy of acupuncture. Raustia AM et al. [40] compared the efficacy of acupuncture with conventional treatment modalities in the management of TMD. It was found that both methods had similar marked effect on a number of subjective and objective variables. List t et al in 1992 compared acupuncture and occlusal splint with a control group [41]. It was found that both acupuncture and occlusal splint reduced symptoms compared with the control group. Acupuncture gave a better subjective result than the occlusal splint. List t et al treated patients with facial pain with acupuncture [42]. It was found that acupuncture may be a realistic alternative to conventional treatment.

Trigeminal neuralgia is a sudden, unilateral, brief, stabbing, recurrent pain in the distribution of one or more divisions of the trigeminal nerve. Carbamazepine is often the first-line treatment for this condition and is considered the gold standard, but it also comes with various side effects such as drowsiness, dizziness and constipation [43]. There are several case reports and case series in Chinese literature on successful acupuncture treatment for patients with trigeminal neuralgia. Studies have shown that by the use of filiform needles and using both local and distal points trigeminal neuralgia can be treated [44]. Positive results have also come with combined use of three needling and point injections [45]. Researches were also done with the combination of use of acupuncture for the treatment of trigeminal neuralgia, Acupuncture points GB14 Yangbai and EX-HN5 Taiyang are used if the ophthalmic branch is affected, ST2 Sibai and ST3 Juliao are used if the maxillary branch is affected and ST6 Jiache and ST7 Xiaguan are used if the mandibular branch is affected. These acupuncture points seem to coincide with

the distribution of the nerve branches. There is however, a paucity of reports in Western literature and lack of randomized controlled trials to verify the effectiveness of acupuncture in the treatment of trigeminal neuralgia.

#### **Management of xerostomia**

Xerostomia, which is dryness in the mouth, is due to decreased or arrested salivary secretion. It affects up to 40% of adults who are over 50 years old [46,47]. Common causes of xerostomia include autoimmune conditions like Sjogren's syndrome, irradiation of the head and neck region, and can also be medication-induced. Conventional management of xerostomia includes use of saliva substitutes or gum chewing, and systemic medication like pilocarpine.

The use of acupuncture as an alternative treatment modality for xerostomia has been documented in the Western medical field since the 1980s. Observational studies have demonstrated that acupuncture treatment may increase salivary flow in healthy volunteers, patients with Sjogren's syndrome and patients who have undergone radiotherapy in the head and neck region [48-50]. A long-term retrospective study involving 70 patients with xerostomia due to primary and secondary Sjogren's syndrome, irradiation and other causes was carried out by Blom and coworkers [42]. The patients received a course of 24 acupuncture treatment sessions over the first six months. Acupoints include those on the head and neck region as well as distal points on the upper and lower limbs. The results showed that Salivary Flow Rate (SFR) in both stimulated and unstimulated saliva was significantly higher after six months compared to baseline and this was consistent with the subjective improvement described by the patients. Data was also analysed up to three years comparing those who chose to receive additional acupuncture treatment

**Table 3.** Ear points of relevance in odontology.

<b>Mandible 5</b>	Indication- Local point for pain in the region, useful in anaesthesia of the mandibular area and bite dysfunction.
<b>Maxilla 6</b>	Indication-Local point for pain in the region, useful in anaesthesia of the maxillary area, and for sinusitis
<b>Shen men 55</b>	Indication-General pain relieving and Relaxing point, which should be Included in every treatment.
<b>Teeth 26</b>	Indication-Useful in all painful dental Conditions in the teeth.
<b>Teeth 27</b>	Indication-Useful in all painful conditions of the teeth.
<b>Occiput 29</b>	Indication-Pain relieving point with special Effect on pain in the face-
<b>Anaesthesia 1</b>	Indication-For dental analgesia.
<b>Anaesthesia 7</b>	Indication-For dental analgesia.

after six months with those who did not. Patients who received additional acupuncture treatment after six months had a consistently higher median SFR in both stimulated and unstimulated saliva compared to those who opted not to, suggesting that supportive acupuncture treatment given over a long-term period may help to maintain its therapeutic effect. This finding is in line with the TCM concept that the effect of acupuncture may be accumulative after repeated sessions. Johnstone and co-workers found that acupuncture treatment may provide relief for Pilocarpine resistant xerostomic patients following radiotherapy for head and neck malignancies [50]. However, the treatment outcome for this study was only based on the Xerostomia Inventory score, which is a self-report questionnaire [51]. In contrast, Blom and co-workers proposed that observation of any increase in SFR following administration of a single dose of Pilocarpine to be an indicator of residual salivary gland function [52]. They found that patients with a positive Pilocarpine test resulted in having significantly higher SFR after acupuncture treatment. Based on these studies, acupuncture therapy seemed to be able to increase SFR, provided that salivary glands were still functional. For patients whose salivary glands were severely affected by radiotherapy and had become resistant to Pilocarpine, acupuncture may, to a limited extent, provide subjective relief for the patients. The realistic expectation of acupuncture therapy in such patients must be managed.

The mechanism behind how acupuncture can increase SFR is still not fully understood. It can be a placebo effect as shown in Pavlovian conditioning in which expectation alone from those receiving treatment can induce saliva production. Local acu-points in the head and neck region may also directly stimulate the nerves innervating the salivary glands. Some authors suggest that the release of neuropeptides from acupuncture treatment can affect blood flow, have anti-inflammatory properties and trophic effects on salivary glands [53]. Another possibility can be related to neuronal activations. In a descriptive study, cortical regions were evaluated using functional magnetic resonance imaging on volunteers undergoing acupuncture treatment [54]. It was observed that acupuncture treatment activated the parietal,

rolandic and frontal operculum as well as the insula, which overlapped with the regions involved in gestation and salivation. The authors proposed that acupuncture treatment may tap into the neuronal circuit which activates the salivary nuclei in the pons and subsequently the salivary glands via the cranial nerves. More studies are needed to investigate how acupuncture therapy can increase salivary flow.

#### **Management of Bell's palsy**

Bell's palsy is a unilateral, lower motor neuron facial paralysis of acute onset. According to TCM concept, invasion of wind pathogens into different meridians of face cause Bell's palsy. A weak body constitution, like one with qi-blood deficiency, may encourage oneself to pathogenic wind invasion to the face, resulting in facial paralysis.

The treatment for Bell's palsy in Western medicine is still controversial due to the lack of ample, prospective randomized controlled trials, although systemic steroids are widely used [55]. The uses of antiviral medications have also been advocated, although its short-and long-term benefit remains inconclusive based on the Cochrane review [56].

The use of acupuncture to treat Bell's palsy is based on the TCM concept that needle manipulation at both the local and distal sites can regulate the flow of qi in the meridians, harmonise qi-blood balance and strengthen the body's resistance to external wind pathogens. It may also help to increase the excitability of nerves and to promote the regeneration of nerve fibres. Some local acupuncture points used include ST6 Jiache, located near the angle of the mandible at the prominence of the masseter muscle and ST7 Xiaguan, located at the depression between the zygomatic arch and the mandibular notch. These two points are found to be anatomically close to branches of the facial nerve.

Several multi-centred randomised controlled trials done in China have shown beneficial effects of acupuncture as an adjunctive treatment for Bell's palsy [57,58]. In the Cochrane review on the use of acupuncture for Bell's palsy, three studies involving 288 patients in total showed that the therapeutic effect of acupuncture alone were superior to that of medication or that acupuncture combined with medication was better than medication alone [59]. However, the varied experimental designs and lack of objective outcome measures preclude a firm conclusion on the beneficial effect of acupuncture. Higher quality randomised control trials are required.

#### **Management of dental anxiety and gag reflex**

According to a recent Cochrane Review 31% of adults are fearful of dental treatment [60]. A phobic patient develops fear towards dental treatment and hence leads to deprivation. Additionally, benzodiazepines and Midazolam have been used to manage dental anxiety. Several reports on the use of auricular acupuncture for treating chronic and acute anxiety have shown promising results [61,62]. A randomized controlled trial comparing auricular acupuncture with intranasal Midazolam for managing dental anxiety suggested that both treatment methods were similarly effective [63]. Gag reflex is a normal protective, physiological mechanism which occurs to prevent foreign objects or noxious material from entering the pharynx, larynx or trachea [64].

The application of acupuncture points like PC6 Neiguan

and CV24 Chengjiang have proved to significantly reduce gag reflex [65]. Reports suggest that Auricular acupuncture is helpful in treating severe gag reflex [66]. According to TCM theory, the acupuncture point PC6 Neiguan, located on the palmar side of the forearm — two inches above the transverse crease of the wrist, belongs to the pericardium meridian, which has the effect of “calming the heart which houses the spirit”. It was proposed that acupuncture may trigger an increase in circulating  $\beta$ -Endorphine, which binds to the opioid receptor, creating an anti-emetic effect [67]. The anti-gagging point located on the ear corresponds with the skin of the external acoustic meatus (innervated by the auricular branch of the vagus nerve) and that adjacent to the auricle (innervated by the Auriculo-temporal branch of the Mandibular division of the trigeminal nerve). More studies to verify the effectiveness of acupuncture in controlling gag reflex should be carried out.

### Efficacy and Prognosis of Treatment

Acupuncture is not a miraculous cure. Acupuncture does not work in all patients. The efficacy varies from one person to the other. There are two reasons for this

- (i) Some patients fail to respond to acupuncture
- (ii) The original diagnosis could be wrong.

A lack of response should always result in re-examination and refinement of diagnosis [68]. Ample amount of positive results have come out in treatment of pain in teeth, bite problems, various types of neuralgia, anxiety etc.

In acute headache and torticollis, patient may get relieved of problem soon after treatment with acupuncture. This will probably only last for a day or so, the period of relief extending with each successive treatment until control is achieved.

### Adverse Effects of Acupuncture

Contrary to the popular belief that conventional medicine is beset by untoward sequelae and that ‘alternative’ techniques are totally safe; there have been numerous reports of adverse effects after acupuncture. These are (to mention a few) Pneumothorax, Endocarditis and hepatitis some resulting in fatalities [69]. However, it must be appreciated that most of these result from ignorance of basic anatomy or because of non applying aseptic procedures by non-medical/dental qualified practitioners. When these are factored out of

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analysis, acupuncture proves to be a very safe technique in the hands of a properly trained practitioner.

### Conditions for Improving the Efficacy

The education in acupuncture is provided by the British Medical Acupuncture Society (BMAS) and the British Dental Acupuncture Society (BDAS) which leads to a diploma after completion. To qualify for this diploma the participants should attend a basic course, a post-basic course and a practical course of a total of 40 hours duration. The basic course teaches the basic principles such as point location, practical needling, the neuro-physiological background, planning treatment etc and allows to implement the acquired skills into dental-related diseases such as TMD, Sjogrens disease, pain management, facial pains, etc.

Participants will, after the basic course, be able to start using the technique on a selected number of conditions but to use the technique on a wider range of diseases an education equivalent to the diploma of basic competence is required.

### Conclusion

The application of acupuncture has a long history and proves to be an effective treatment modality in TCM sector. Be it in control of post-operative pain or in the management of TMD and facial pain it may be a useful alternative to the conventional therapeutic armamentarium of the general dental practitioner. As a sole analgesic for operative intervention its value is doubtful. Although the mechanism of action and positive clinical trials lag much behind the widespread use, physicians ought to become familiar with its potential applications for their patients. Some physicians may wish to expand the scope of his or her practice by taking additional training to administer acupuncture. These skills may be acquired with a short postgraduate or diploma training programme, which would provide an extra edge to the patient-oriented holistic treatment approach that all health care providers strive to achieve.

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