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Research Paper

Acupuncture and Its Implications in Dentistry

Medical Science

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ABSTRACT

Acupuncture, an alternative therapy which originated in China is now practised in various countries of the world It is a technique that involves the use of needles placed transcutaneously at specific points to cure the diseases. Its applications and popularity has grown over the years and is practised by various healthcare professionals for lower back pain, migraine, knee osteoarthritis, fibromyalgia, nausea and vomiting, headache, dysmenorrhea etc. Its use has been extended to the field of dentistry and promising results have emerged in cases of temporomandibular disorders, dental pain, chronic facial pain, xerostomia and gagging. This manuscript reviews the uses of acupuncture in dentistry and its future growth.

Introduction

The history of complementary and alternative (CAM) medicine goes around 5000 years back with the use of Ayurvedic and traditional Chinese medicine to cure the diseases.[1] Despite the pervasiveness, power, and promise of contemporary medical science, large segments of humanity either cannot access its benefits or choose not to do so.[2] The National Institute of Health's National Center for Complementary and Alternative Medicine (NCCAM) defines complementary and alternative medicine (CAM) as "a group of diverse medical and health care systems, practices, and products that are not generally considered part of conventional medicine.[3] The categories classified by NCCAM for complementary and alternative medicine includes homeopathic and naturopathic medicine, Traditional Chinese medicine (TCM), Indian Ayurveda, mind- body interactions, chiropractic, osteopathic manipulation, massage, acupuncture and energy therapies consisting of Gi Gong, Reiki, and therapeutic touch.[1]

Acupuncture, an alternative therapeutic modality which has been practised for thousands of years in China is the most widely used procedure in modern times.[4] It is a technique which involves the use of needles that are placed transcutaneously at specific points to cure diseases and restore health.[5] The earliest written record of acupuncture was found in the Huangdi Neijing, translated as The Yellow Emperor's Inner Canon, dated approximately 200 BC.[6] It is considered to be one of the world's oldest healing arts and has become the treatment of choice for various diseases in many countries.[7] Acupuncture has been tried by millions of patients and is practiced by a large number of physicians, dentists, acupuncturists for a variety of health conditions.[3] A patient may choose acupuncture instead of conventional treatment or may try acupuncture when other treatment modalities have failed to provide relief.

Traditional theory of acupuncture

According to principles of traditional Chinese medicine, the functions of the body are regulated by an energy called "vital energy" or "qi" which continuously flows through the organs along channels called meridians.[8] Hung Ti described that the forces of the nature are balanced by the opposites Yin and Yang. The Yin and Yang are present in equal quantities throughout our environment and the body, and maintain health. An interruption in the flow of "vital energy" causing imbalance in the opposites Yin and Yang is believed to be the cause of the disease. Acupuncture involves the insertion of metallic needles at acupuncture points located along the meridians to regulate the flow of qi and correct the imbalance. About 365 points, located on 14 meridians have been identified in traditional Chinese medicine.[9]

Modern research on acupuncture

Current researchers have put forward various theories to explain the mechanism of action of acupuncture. One theory proposed by Pomeranz explained the activation of A- delta and C fibers, responsible for transmission of the pain through muscles. These fibers then transmit the signals to spinal cord and cause release of dynorphin and enkephalins. These signals further propagate through midbrain and cause release of neurotransmitters, such as nor epinephrine, serotonin and dopamine into spinal cord. There is presynaptic and postsynaptic inhibition and suppression of pain transmission.[10] Another theory explained that the effect of acupuncture is similar to the gate control theory. The needling sends impulses along the large fibers, resulting in overcrowding or jamming of the gate, causing it to close on small afferent C fibres producing inhibitory effect. [11] One study proposed that there is a direct stimulation of peripheral nerve sensory fibers and an increase in pain threshold. [12]

Some studies have observed that acupuncture stimulates the release of substance P, a vasoactive intestinal polypeptide and calcitonin – gene related peptide leading to vasodilation and ultimately increase in blood flow to the affected areas. Acupuncture needling causes the release of adrenocorticotrophic hormone, serotonin and endorphins in the hypothalamus and pituitary; improving the immune system and producing a positive effect in stress and anxiety. Also some imaging studies have supported the hypothesis that limbic system plays a central role in acupuncture induced analgesia.[6,13]

Acupuncture has been widely used to treat a variety of medical conditions such as low back pain, chronic headache, knee osteoarthritis, fibromyalgia, herpes zoster, migraine, dysmenorrhea, smoking cessation etc.[15] The vast majority of papers on acupuncture consist of case reports, case series, controlled trials and intervention studies. Over the years the use of acupuncture has been extended to dentistry. Various conditions like gagging, temporomandibular disorders, myofascial pain, xerostomia,

burning mouth syndrome have been treated successfully with acupuncture. The purpose of this article is to discuss the applications of acupuncture in dentistry.

Acupuncture for gagging

Gagging is a protective and physiologic mechanism that occurs to prevent foreign objects from entering the pharynx. It is frequently encountered in dental practice while receiving various dental treatments and thus poses problem. Acupuncture has been used by some researchers to control gagging and was found to be effective with no morbidity. Lu in his study established that acupuncture of point PC-6 (pericardium 6), located on forearm was effective in controlling gag reflex.[16] Fiske and Dickinson used anti-gagging point on ear in ten patients to control gagging and reported acupuncture to be successful and safe. [17] Rosted et al. evaluated the use of acupuncture point CV-24 (conception vessel 24), located in the chin in 64 patients requiring an alginate impression with severe gag reflex and noticed that 81% of the patients were able to accept impression taking. [18] Thus acupuncture can be a competent alternative to conventional sedation techniques used to control gagging.

Acupuncture for dental pain

S.S. Silva reported the use of acupuncture largely to induce analgesia in patients undergoing surgical procedures (extractions, incision of abscesses, excision of tumors, and insertion of radium needles) and for symptomatic relief of pain (simple toothache, post-extraction pain, and trigeminal neuralgia).[12] Lao et al. in their study included subjects who had undergone 3rd molar removal and treated them with acupuncture or placebo. The following acupuncture points were used in each patient: Hegu (LI 4), Jiache (St 6), Xiaguan (St 7), Yifeng (SJ 17). They reported 181 minutes pain free time with acupuncture as compared with 71 minutes in the placebo group.[19] A systematic review on the effectiveness of acupuncture in treating acute dental pain by E. Ernst and M H Pittler recognized 16 trials and concluded that acupuncture is effective in alleviating pain either during dental operations, following surgery or during experimentally induced dental pain in human volunteers.[20]

Acupuncture for myofascial pain

Myofascial pain is a frequent source of chronic pain characterized by local areas of hypersensitive bands of muscle tissue. Greg Goddard and colleagues randomly subjected 18 patients with myofacial pain to classical acupuncture and sham puncture. The acupuncture group had needles inserted at both right and left Hoku points (LI 4) as well as the right and left Stomach points. Sham group had needles inserted at right and left hand 1 cm distal of the Hoku point and 1 cm dorsal to the stomach point. They observed that both modalities reduced pain by mechanical stimulation of masseter muscles.[21] Yoshi F. Shen et.al in their study among 28 subjects aged over 18yrs, diagnosed with chronic myofascial pain of the jaw muscles found that a single acupuncture session for 15 minutes at the Hegu large intestine 4 (LI4) acupoint which is commonly used for head and neck pain significantly reduced myofascial pain.[22]

Acupuncture in temporomandibular disorders

Cynthia D Myers and colleagues in their systematic review identified three randomized clinical trials of acupuncture versus stomatognathic treatment in TMD which showed improvement in both the group.[23] A systematic review about the use of acupuncture for temporomandibular disorders identified 19 randomized control trials including 808 patients. Three trials comparing classical acupuncture with placebo showed positive response in patients receiving acupuncture. When compared to other common treatment modalities for TMD such as occlusal splint therapy (three trials), physical therapy (four trials), and wait-list control (three trials), acupuncture showed equivalent efficacy establishing moderate effectiveness. Various acupoints for acupuncture treatments were included in the RCT's; the ST7, LI4, or SI19 acupoints were commonly selected in over 5 trials.[24] A randomized clinical trial carried on 20 patients with temporomandibular joint pain function syndrome revealed that acupuncture was an effective alternative modality to decompression splints in pain reduction and improving mouth opening. Patients with the acupuncture therapy were treated with local and distal acupuncture points (acupoints). Local acupoints were: EX-HN5, SJ21, GB2, SJ17, ST6 and distal acupoints were: LI-4, ST-36, SJ5 and GB34.[25] It is believed that acupuncture induces analgesia through segmental and heterosegmental effects, improves circulation and healing and cause release of trigger points.[26]

Acupuncture in the treatment of Bell's palsy

Though steroids have conventionally been used in the treatment of Bell's palsy, acupuncture was also used by the Chinese since it was cost effective and convenient. Feng Xia et.al in their study found that prednisolone therapy with acupuncture showed positive results The acupuncture points used were Dicang (ST4), Jiache (ST6), Yangbai (GB14), Xiaguan (ST7), TaiyangM (EXHN5), Quanliao (SI18) and Yifeng (TE17) on the affected side, and Hegu (LI4) bilaterally.[27] Some studies which examined physical exercises and acupuncture illustrated possible clinical advantage however; they were of shorter treatment duration and with high risk of bias.[28]

Acupuncture for xerostomia

The use of acupuncture for xerostomia first appeared in the Western medical literature in 1981.[29] Since then many studies have been carried out to determine the efficacy of acupuncture in xerostomia. Peter and colleagues in their experience found that a regimen of three to four weekly treatments followed by monthly sessions of acupuncture had a palliative effect on patients with xerostomia after radiotherapy for head and neck malignancies. They used three auricular acupoints on the ears bilaterally and a single point LI2 on distal radial aspect of index finger.[30] Mary D. P. reported in a study among 19 patients who developed xerostomia after completing a course of bilateral, external-beam radiotherapy (4000 centigrays) were subjected to acupuncture treatment twice a week for 4 weeks. They found that acupuncture could improve the subjective symptoms of dry mouth and that these effects persisted for at least 1 month after acupuncture treatment.[31] Fabio P. F. B et.al in their study among 24 patients found that acupuncture was effective in minimizing the severity of radiation-induced xerostomia in patients with head and neck cancer and it was preferred to pharmacological agents (e.g., pilocarpine or amifostine) because of no significant side-effects. Local (ST-3, ST-4, ST- 5, ST-6, ST-7, GB-2, SI-19, TB-21), distal (LI-4, LI- 11, LR-3, ST-36, KI-3, KI-5, GV-20), and auricular (Shen-Men, Central Nervous System, Neurovegetative System, Kidney, Spleen, Pancreas, and Mouth) acupoints, named in accordance with the WHO Standard Acupuncture Nomenclature, were included.[32]

Acupuncture for recurrent aphthous stomatitis (RAS)

Mikhailova and colleagues (1992) in their study used laser therapy and laser acupuncture at biologically active sites in 24 chronic recurrent aphthous patient and found good results in the fibrous form of the lesions However randomized clinical trials have not been done to substantiate the efficacy of acupuncture in RAS.[33]

Acupuncture for burning mouth syndrome

Burning mouth syndrome (BMS) is a chronic condition with intraoral burning sensation and no relevant medical or dental cause. Scardina A and colleagues compared the oral microcirculation of 30 BMS patients with 30 healthy subjects and noticed that after receiving three weeks of acupuncture there was significant increase of the capillary tortuousness and density, a reduction of the arborescence and a reduction of burning sensation in BMS patients.[34] Yan Z and colleagues in their systematic review recognized nine studies with 547 randomized patients with burning mouth syndrome. The nine studies were published in Chinese and most commonly used acupoints were LI4, LI11 and SI17 with treatment session ranging from 10 days to 3 weeks. Their results supported the efficacy of acupuncture in reducing BMS pain and related symptoms.[35]

Safety and acupuncture

The occurrence of side effects in practice of acupuncture has been reported to be low. The adverse effects which have been

documented in literature while practicing acupuncture includes common side effects such as fainting during treatment, nausea and vomiting, increased pain, diarrhea, local skin irritation including bruising and bleeding at needle sites, psychiatric disturbance, headaches, sweating, needle breakage and rare symptoms such as pneumothorax, Spinal cord injury, hepatitis B, septicemia, punctured organs, convulsions, argyria. [36,37,38] Thus it is important for the clinician to be well aware of the adverse effects of acupuncture and their management. A thorough knowledge of the procedure and a proper training is essential to avoid any risk before practicing acupuncture. Also the patient should be well informed about the potential risks and their outcomes. As the adverse effects reported are occasional, it is basically considered a safe procedure and it has been observed that the numbers of side effects were reduced when acupuncture was practiced by trained professionals.[38]

Conclusion

Acupuncture has been incorporated as a commonly used intervention in today's health care system. Evidence shows that acupuncture has proved to be beneficial in a number of painful conditions and is now widely accepted treatment modality used by many medical and dental practitioners. Various theories have been put forth to explain its mechanism however none of them are fully accepted. Some researchers consider acupuncture to be nothing more than a powerful placebo response. But the data available in support of acupuncture is strong and the incidence of harmful side effects is low. In dentistry promising results have been emerged in cases of TMD, dental pain, chronic facial pain and xerostomia.The matter of concern is that many of the studies suffer from methodological defects and the number of trial subjects has been limited. Thus, it is important to determine the therapeutic value of acupuncture through adequate design, sample size and placebo control, so as to understand its mechanism and to standardize its use. Also, issues such as cost-effectiveness, proper training, licensure and accreditation should also be considered.

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