Effectiveness of acupuncture-induced anesthesia in controlling tooth hyperesthesia during tooth preparation

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ABSTRACT

Dentine hypersensitivity is characterized by short, sharp pain arising from exposed dentin in response to stimuli. In this split-mouth randomized clinical study, we investigated acupuncture as an effective way of providing anesthesia to relieve dentinal hypersensitivity. A total of 15 patients, 20 bilateral maxillary and mandibular vital teeth (40 sites) indicated for tooth preparation, were selected for the study and randomly allocated to two groups, A and B. Patients in Group A underwent tooth preparation with acupuncture on the right side and with subperiosteal infiltration on the left side, while vice versa was followed for Group B. Following tooth preparation, patients interpreted their sensation during the procedure using the Heft–Parker VAS score. The result of the Mann–Whitney U-test showed that the two techniques had no statistical significant difference ($P = 0.330$, $> 0.05$). Hence, it was proved that both the techniques are equally effective in providing adequate anesthesia for tooth preparation.

KEY WORDS: Acupuncture, Dentin hypersensitivity, Subperiosteal infiltration, Tooth preparation

INTRODUCTION

Dentin hypersensitivity (DH) is the most common noxious sensation experienced by the patients during vital tooth preparation in restorative dentistry. Dentin sensitivity (DS) is often used interchangeably with DH to describe a short sharp pain that is actually a normal pulpal response to the exposed dentin.[1,2] The condition has been defined by an international workshop on DH as “Dentine hypersensitivity is characterized by short, sharp pain arising from exposed dentin in response to stimuli, typically thermal, evaporative, tactile, osmotic or chemical and which cannot be ascribed to any other dental defect or pathology.”[3] Various studies have attempted to find the incidence of DS through patient questionnaires and clinical trials, and it ranges from 4 to 74%. A slightly higher incidence of DH is reported in females than in males and buccal aspect of tooth cervical area is the commonly affected site.[4-6] Dentin is traversed by canal-like tubules which contain odontoblastic processes. Together with the pulp, it forms a dentin-pulp complex which is naturally sensitive. Although histologically different, dentin and pulp embryologically originate from the same precursor, that is, the eotomesenchyme. Pulp is integrally connected to the dentin, that is, physiologic and/or pathologic reactions in one of the tissues will also affect the other.[7] It has been stated in the literature that DH develops in two phases: lesion localization and lesion initiation.[8] Lesion localization occurs by loss of protective covering over the dentin, thereby exposing it to the external environment. It includes loss of enamel through attrition, abrasion, erosion, or abfraction. Another cause for lesion localization is tooth preparation for crown. For DH to occur, the lesion localization has to be initiated. It occurs after the protective covering of smear layer is removed, leading to exposure and opening of dentinal tubules. Various theories have been proposed for DH, but the most accepted one came in 1964 by Brannstrom. He proposed that the dentinal pain is due to hydrodynamic mechanism, that is, fluid force. There is a centrifugal movement of fluid inside the dentinal tubules which in turn, activates the nerve endings at the end of dentinal tubules or the pulp–dentin complex.[9] The response of pulpal nerves, mainly Aδ intra-dentinal afferent fibers, depends on the pressure applied, that is, the intensity of stimuli. It has been noted that stimuli which tend to move the fluid away from the pulp–dentin complex produce more pain. These stimuli include cooling, thermal injury, drying, evaporation, and application of hypertonic chemical substances.[10,11]
Diagnosis of DH starts with a thorough clinical history and examination. A simple clinical method of diagnosing DH includes a jet of air or using an exploratory probe on the exposed dentin, in a mesiodistal direction, examining all the teeth in the area in which the patient complains of pain.[12] The severity or degree of pain can be quantified either according to a categorical scale (i.e., slight, moderate or severe pain) or using a visual analog scale (VAS).[9]

The VAS is one of the most widely used and has been found to give valid and reliable data when used to measure experimental pain as well as acute and chronic pain in patients.[13] The advantages and disadvantages regarding the VAS and other similar scales have recently been extensively discussed in the literature and VAS is the commonly used outcome measure to evaluate pain and sensitivity.[13] One of the effective VAS scores to elicit appropriate response for pain is Heft and Parker score. It presents a scale incorporating subjects’ common understanding about pain.[14]

DH with an underlying etiology can be managed and prevented from recurring by simply attending to the etiological factor such as faulty tooth brushing and excessive intake of acidic foodstuffs. Sometimes the medical practitioner can prescribe a desensitizing agent or an occlusal splint to cover the teeth surfaces.[15] DH during tooth vital or cavity preparation is inevitable and to prevent that, proper anesthesia must be secured. Invasive dental procedures such as tooth extractions and minor surgeries can cause potential pain and discomfort to the patient if an adequate anesthetic technique and formulation are not chosen. Nerve blocks have been used to obtain anesthesia of a particular region. For instance, inferior alveolar anesthesia has been used effectively to facilitate all types of dental procedures.[16] The success rate of these nerve blocks depend on the anatomy of the nerve, technique of delivery of anesthetic solution, collateral innervations, and varying degrees of inflammation of the pulp, and hence have certain post-injection complications which include paresthesia, trismus, xerostomia, hematoma formation, and transient facial nerve paralysis.[17] Although not frequently encountered in the clinical setting, allergic reactions to local anesthetics do occur. Various surveys indicate the number of deaths attributed to local anesthesia range from 1:1,500,000 to 1:4,000,000. Adverse effects include the negative effects of any vasoconstrictors contained within the local anesthetic solution.

Acupuncture is one of the various alternative methods that can be used to manage patients allergic to local anesthetic products to alleviate pain during restorative and surgical procedures.[18] While performing non-surgical dental restorative procedures, rather than a profound soft-tissue anesthesia covering a wide area, an anesthetic technique which gives an efficacious pulpal anesthesia of a single tooth can prove more patient-friendly. Infiltration, also known as subperiosteal infiltration, can be routinely used because of its substantial effectiveness.[19] Acupuncture originated in China more than 3000 years ago and involves insertion of needles into various parts of the body with the intention of curing disease.[20] In the Geneva WHO 2003 report, pain in dentistry including dental pain and temporomandibular dysfunction, facial pain, and post-operative pain was listed among the conditions, for which acupuncture has been proven to be successful through controlled trials, to be an effective treatment. Acupuncture has been explored as an adjunct to local anesthesia, as an analgesic modality for post-operative dental pain, anti-inflammatory action, dental anxiety and gag reflex, myofascial pain, TMDs, neural pain, and xerostomia. Its role as an anesthetic technique during a restorative procedure such as tooth preparation has not been studied extensively and needs to be explored further.

**Aim**

The aim is to evaluate the effectiveness of acupuncture in relieving DH during tooth preparation and to compare its effectiveness with subperiosteal infiltration induced anesthesia.

**Null Hypothesis**

There is no difference in anesthetic effectiveness between subperiosteal infiltration technique and acupuncture technology during tooth preparation.

**Alternative Hypothesis**

There is a difference in anesthetic effectiveness between subperiosteal infiltration technique and acupuncture technology during tooth preparation.

**MATERIALS AND METHODS**

An *in vitro*, experimental, randomized control trial was designed to evaluate and compare the anesthetic effectiveness between acupuncture and subperiosteal infiltration technique over tooth hyperesthesia (DH) in mandibular and maxillary posterior teeth preparation. A split-mouth design was utilized for this purpose. The subjects who were selected based on the inclusion and exclusion criteria were randomly allocated to the type of interventional anesthetic technique. A total of 15 healthy human subjects, involving both genders with totally 20 bilateral, vital posterior maxillary or mandibular teeth indicated for tooth preparation, were selected from the Outpatient Department of Saveetha Dental College and Hospital, Chennai. The screening was done over 2 months. Written informed consent was signed by the selected subjects. All ethical guidelines specified by the WHO and the Declaration of Helsinki, 1954 were satisfied. The study was
approved by the Scientific Review Board of Saveetha University, Chennai, India. The ethical clearance for the study was obtained from the Institutional Human Ethical committee of Saveetha University, Chennai, India (SRB/SDMDS14/PRS17). The sample size was estimated to be 40 sites in selected human subjects satisfying the inclusion criteria with an a priori/ad hoc power estimation of 80% and statistical significance was set at 5%. The human subjects were selected for the study based on the inclusion criteria. The subjects were divided into two equal groups (Group A and Group B) using coin flip method and based on inclusion characteristics such as 25–65 years of age, both males and females, adequate mouth opening, bilateral mandibular/maxillary vital posterior teeth indicated for tooth preparation, and willingness to participate in the study. Patients with acute oral infections, periodontally compromised abutments, endodontically treated abutments, fractured abutments, macroglossia, and limited mouth opening were excluded. The site of the intervention was also decided by a coin flip, heads for right side receiving subperiosteal and left, acupuncture and tails, vice versa. After 10 min of the tooth preparation, another investigator interviewed the patient for VAS scores. In the subjects categorized into Group A, lignocaine was deposited over the apices of the abutment teeth on the buccal side using the subperiosteal infiltration technique. A 25-gauge needle was inserted midway between the gingival margin and the approximate apex of the tooth at right angle to the buccal alveolar plate. As the needle progressed, about 0.3–0.5 ml of local anesthetic solution was injected slowly [Figure 1].

The periosteum would force the solution through the cortical plate into the cancellous bone. The tooth preparation was started, and the patient was asked to rate the hyperesthesia/sensitivity during tooth preparation based on Heft–Parker VAS score. In Group B, the side for subperiosteal injection was switched. On the other side in both the groups, acupuncture was performed by a trained and certified acupuncturist. Fine stainless steel disposable needles were inserted into the skin by tapping through a plastic needle tube to a depth of 0.3–0.8 inch, over certain acupuncture points, namely, SI 18, ST 2, ST 3, GV 26, CV 23, LI 4, ST 44 [Table 1 and Figure 2a-c].

The needles remained in place through the process of tooth preparation and the patient was asked to rate the hyperesthesia/sensitivity based on Heft–Parker VAS score. After completion of the preparations, temporary restorations were cemented. The pain and sensitivity rating was done on Heft–Parker VAS [Figure 3].

The scale consists of a 170-mm line with various descriptive terms. The subjects placed a mark on the scale where it best describes their pain level. The VAS was divided into four categories. No pain corresponds with 0 mm. Mild pain was defined as >0 mm and ≤54 mm. Mild pain includes the descriptors of faint, weak, and mild pain. Moderate pain was defined as >54 mm and <114 mm. Severe pain was defined as ≥114 mm. Severe pain includes the descriptors of strong, intense, and maximum possible.16–19 The patients rated the pain and sensitivity in the Heft–Parker VAS and the values were tabulated and subjected to statistical analysis.

**RESULTS**

The Heft–Parker Visual Analog Scores were expressed according to the scale from the test subjects Group A receiving subperiosteal infiltration first on the right side and acupuncture on the left and Group B receiving acupuncture first on the right side followed by subperiosteal on the left. The values obtained were tabulated and subjected to statistical analysis to test significance at 5% level. The nature of the data was ordinal, and hence, non-parametric tests were used. However, the VAS scores can also be treated as nominal data and hence an independent t-test was also done to estimate the difference between the means of the two experimental groups. Mann–Whitney U-test and Independent t-test were used to compare the mean values between the nerve block group and the infiltration group at 5% significance ($P < 0.05$%). For the statistical analysis, Statistical Package for the Social Sciences version 20 software was used. The results were interpreted as follows [Table 2] shows the Heft–Parker scores for the prepared teeth under subperiosteal infiltration and acupuncture techniques.

Parker scores of subperiosteal infiltration technique was 2.7 ± 4.65 and for acupuncture was 3.3 ± 4.16. The $P$-value obtained was 0.670 denoting that there is no significant difference between the two techniques [Table 3].

Mann–Whitney test comparing the mean Heft–Parker scores between subperiosteal infiltration technique and acupuncture. The $U$ value was 166.0. The $P$-value obtained was 0.369. The $P$ value was ($P > 0.05$) at 95%
confidence interval implying no significant difference between the two techniques [Table 4].

**DISCUSSION**

Alleviating the pain is of paramount importance for the clinician while treating apprehensive dental patients. Various factors contribute to increased pain perception such as psychological factors, genetic factors, previous history of traumatic dental experience, psychosomatic factors, neurological factors, and anxiety. Furthermore, the type of the needle being used, the topography of the needle bevel, site of the injection, type of solution being used, injection into blood vessels and rate of

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**Table 1: Acupoints for dental anesthesia**

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>SI 18 (Quan Liao)</td>
<td>Directly below the outer canthus of the eye in a depression on lower border of zygoma</td>
</tr>
<tr>
<td>ST 2 (Sibai)</td>
<td>Below the pupil, in a depression at the infraorbital foramen</td>
</tr>
<tr>
<td>ST 3 (Jialao)</td>
<td>Directly below the pupil in a depression at the level of ala of nose</td>
</tr>
<tr>
<td>GV 26 (Shui Gou)</td>
<td>At the junction of upper and middle third of the philtrum</td>
</tr>
<tr>
<td>CV 23 (Lian Quan)</td>
<td>At the upper border of hyoid</td>
</tr>
<tr>
<td>LI 4 (He Gu)</td>
<td>Highest point when thumb and index finger are brought close</td>
</tr>
<tr>
<td>ST 44</td>
<td>Proximal to the web margin between 2nd and 3rd metatarsal bones, in a depression distal and lateral to 2nd metatarsal digital joint</td>
</tr>
</tbody>
</table>

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**Table 2: Heft–parker VAS scores for 20 sites**

<table>
<thead>
<tr>
<th>Age</th>
<th>Gender</th>
<th>Tooth prepared</th>
<th>VAS-ACU (tooth)</th>
<th>VAS-SP (tooth)</th>
</tr>
</thead>
<tbody>
<tr>
<td>63</td>
<td>m</td>
<td>17/27</td>
<td>6 (27)</td>
<td>5 (17)</td>
</tr>
<tr>
<td>52</td>
<td>f</td>
<td>37/47</td>
<td>0 (47)</td>
<td>0 (37)</td>
</tr>
<tr>
<td>52</td>
<td>f</td>
<td>17/27</td>
<td>0 (17)</td>
<td>0 (27)</td>
</tr>
<tr>
<td>42</td>
<td>m</td>
<td>16/36</td>
<td>0 (16)</td>
<td>0 (26)</td>
</tr>
<tr>
<td>40</td>
<td>f</td>
<td>15/25</td>
<td>7 (25)</td>
<td>0 (15)</td>
</tr>
<tr>
<td>45</td>
<td>f</td>
<td>34/44</td>
<td>8 (44)</td>
<td>6 (34)</td>
</tr>
<tr>
<td>63</td>
<td>m</td>
<td>34/44</td>
<td>5 (44)</td>
<td>5 (34)</td>
</tr>
<tr>
<td>19</td>
<td>f</td>
<td>16/26</td>
<td>0 (26)</td>
<td>0 (16)</td>
</tr>
<tr>
<td>19</td>
<td>f</td>
<td>35/45</td>
<td>0 (35)</td>
<td>0 (45)</td>
</tr>
<tr>
<td>62</td>
<td>m</td>
<td>36/46</td>
<td>2 (36)</td>
<td>4 (46)</td>
</tr>
<tr>
<td>39</td>
<td>f</td>
<td>37/47</td>
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<td>5 (37)</td>
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<tr>
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<td>0 (15)</td>
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<tr>
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<td>1 (35)</td>
<td>1 (45)</td>
</tr>
<tr>
<td>56</td>
<td>f</td>
<td>15/25</td>
<td>5 (15)</td>
<td>0 (25)</td>
</tr>
<tr>
<td>62</td>
<td>m</td>
<td>35/45</td>
<td>0 (35)</td>
<td>0 (45)</td>
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<tr>
<td>62</td>
<td>m</td>
<td>15/25</td>
<td>0 (25)</td>
<td>0 (15)</td>
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<td>52</td>
<td>m</td>
<td>35/45</td>
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<td>64</td>
<td>m</td>
<td>16/26</td>
<td>7 (26)</td>
<td>5 (16)</td>
</tr>
<tr>
<td>64</td>
<td>m</td>
<td>36/46</td>
<td>4 (36)</td>
<td>2 (46)</td>
</tr>
</tbody>
</table>

**Table 3: Independent samples t-test comparing the mean heft-parker VAS scores for acupuncture and subperiosteal infiltration techniques**

<table>
<thead>
<tr>
<th>Techniques</th>
<th>N</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Standard error mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acupuncture</td>
<td>20</td>
<td>3.300</td>
<td>4.1681</td>
<td>0.93217</td>
</tr>
<tr>
<td>Infiltration</td>
<td>20</td>
<td>2.700</td>
<td>4.65776</td>
<td>1.04151</td>
</tr>
</tbody>
</table>

**Levene’s test for equality of means**

<table>
<thead>
<tr>
<th>Equal variances assumed</th>
<th>t-test for equality of means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equal variances</td>
<td>F</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>0.018</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>0.429</td>
</tr>
</tbody>
</table>

VAS: Visual analog scale
deposition, play a crucial role in pain perception during injection. In dental practice, patients can experience pain due to pulpal pathology, periodontal pathosis, infections, malignancies, trauma, and caries. The management of all the conditions invariably utilizes definitive forms of anesthesia for treatment; however, the use of anesthetic agents during dental restorative procedures, not involving the pulp is subject to debate and literature evidence is inconclusive. Even though anesthetic agents may not be required for restorative dental treatment procedures, they have to be used in apprehensive patients with a low pain threshold or increased hypersensitivity. The exposure of the root surfaces, cervical abrasions, attritions, abrasion, and usage of burs during tooth preparation and cavity preparation can cause severe hypersensitivity as the free nerve endings in the dentinoenamel junction are stimulated. Similarly, cementum exposure leaves the dentin vulnerable to attack from the high-speed water and compressed air emanated from the dental handpieces which could stimulate the pulpal nerve endings and induce pain. The usage of local anesthesia becomes mandatory in the successful treatment of such conditions to improve patient compliance and establish confidence in the clinician. The various anesthetic modalities available in dentistry are nerve block anesthesia, infiltration anesthesia, transosseous anesthesia, subperiosteal infiltration, intraligamental, intrapulpal, intranasal, sublingual, conscious sedation, general anesthetic techniques, and acupuncture. Among these, the commonly used anesthetic techniques include nerve block and site-specific infiltration techniques.

The main advantages of the infiltration anesthesia include simplicity of the technique, improved patient and operator characteristics, and reasonably profound anesthesia. The limitations of these techniques include irregular rate of diffusion, varying levels of bone density restricting diffusion, and presence of acidic pH in the exudates present which could neutralize the anesthetic solution.

Nerve block anesthesia provides a lot of advantages such as profound anesthesia, wider area of anesthesia, increased duration of anesthesia, and faster onset of anesthesia. The disadvantages include variation in anatomical landmarks, making the technique cumbersome and ineffective, iatrogenic injury to the blood vessels, nerves, injury to muscles, resulting in
trismus, and the numbness leading to lip and cheek biting. With the advent of newer anesthetic agents and improvised technique, infiltration technique can provide adequate anesthesia for most dental procedures. However, allergy to local anesthetic agents and certain adverse drug reactions in medically compromised patients and conditions like pregnancy may require alternate modes of anesthesia and acupuncture could be a potential alternative in such situations. In Japan, by the middle of 1972, Hyodo had experimented with 30 cases of acupuncture anesthesia, one elbow operation, three clavicular operations, three sinus operations, two tonsillectomies, four teeth extractions, three oral tumor resections, four evacuations of the uterus, two transvaginal hysterectomies, two vaginal polyp operations, one Madrener’s operation, one Schullocker’s operation, one Schauter’s operation, one rectovaginal fistule operation, and one neck tumor operation. He performed the first largest acupuncture anesthesia. Although it may not be rational to summarize the success rate for such a variety of operations, 80% of the operations were successful.[21,22] Acupuncture anesthesia was also performed by Kadoh et al. on 11 patients requiring minor surgical operations [tumor enucleation (subdorsal, brow, breast, abdomen, cervical, crus) onychectomy and ganglion extraction].[23]

Kamei et al. extracted teeth under acupuncture analgesia using D-phenylalanine (DPA) pre-medication. Forty patients were divided into two groups: A test group (nine cases) that had DPA administration 30 min before acupuncture analgesia and group (31 cases) that had only acupuncture analgesia. In the acupuncture analgesia group, absolutely no pain or only slight pain was felt in about 30% of the cases, while in the test group, there was almost no need for supplementary local anesthesia, and generally, good results were obtained in most cases.[24]

Kitade et al. also investigated the efficacy of acupuncture analgesia in teeth extractions using DPA pre-medication on 56 patients in a double-blind placebo-controlled study. The study showed that the efficacy of acupuncture analgesia in teeth extractions increased to 35% by DPA pre-administration compared with 38 placebo group cases. They also concluded that DPA pre-administration enhanced acupuncture analgesia for teeth extractions.[25]

A systematic review assessed the effectiveness of acupuncture for treating acute dental pain. This review included 16 controlled trials, most of which implied that acupuncture was effective in dental analgesia. The reviewers concluded that acupuncture could alleviate dental pain.[26]

In contrast to these studies, another randomized controlled trial was conducted to determine if dry needling acupuncture at a specific acupoint could reduce the dental pulp sensory threshold produced by electrical pulp stimulation of incisor teeth. A total of 40 healthy adults who had never received acupuncture nor had any incisor dental restorations were given real or sham acupuncture (the latter with a blunt needle that only touched the skin without penetrating it). No significant differences in pain reduction were noted between the volunteers who received verum acupuncture and those who received the sham acupuncture. The researchers concluded that acupuncture did not reduce dental pulp sensory threshold.[27]

A study was conducted by Rosted and Bundegard in 2003, to investigate if the induction time of a local anesthetic can be reduced if acupuncture is administered before injection. In the group who received local acupuncture before injection of an inferior alveolar nerve block (with prilocaine hydrochloride), the induction time was 62 seconds versus ∼2 min in the control group in whom only the nerve block was administered. Findings from this study suggested that regional acupuncture can accelerate the induction time after a nerve block is administered.[28]

Anand et al. studied the application of acupuncture in the management of patients with gag reflex during dental procedures and reported beneficial effects.[29] Jalali et al. studied the effect of acupuncture before endodontic treatment and reported increased effectiveness of inferior alveolar nerve block for mandibular molars with symptomatic irreversible pulpitis.[30]

Hu et al. have reported acupuncture anesthesia as an alternative to dental extractions with patients with allergy to xylocaine.[31] Tavares et al. evaluated the efficacy of electroacupuncture on post-operative pain control after mandibular third molar surgery. Electroacupuncture was applied on bilateral systemic and two auricular points using a special appliance using 40–60 Hz frequency for 20 min and concluded electroacupuncture therapy was very effective in controlling post-operative pain following mandibular third molar surgical removal.[32] Pohodenko-Chudakova studied the effectiveness of acupuncture analgesia in 120 patients and concluded acupuncture analgesia as a useful adjunct to conventional anesthesia in maxillofacial surgery.[33] Sardella et al. investigated the effect of combined acupuncture and auriculotherapy on pain management in patients with burning mouth syndrome and concluded substantial effectiveness in reduction of the intensity of burning sensation and pain and marked improvement in the quality of life.[34]

Branco et al. studied the effectiveness of acupuncture in the management of temporomandibular joint...
disorders in females and concluded the best acupuncture treatment involved local acupoints for TMD with joint components and acupoints at a distance for TMD’s with. [35] Grillo et al. demonstrated the equal effectiveness of acupuncture and occlusal plane appliance in the management of myogenic temporomandibular dysfunction. [36]

Usichenko et al. reported the effectiveness of acupuncture by stimulation of acupoint LI4 which reduced pain and autonomic distress in children during local anesthetic injection in dental procedures. [37] Boleta-Ceranto et al. studied the analgesic efficacy of systemic acupuncture therapy on pain control after orthodontic adjustments and reported reduction in pain with acupuncture treatment. [38] Grillo et al. reported acupuncture as a technical adjunct to reduce the intensity of acute dental pain in patients waiting for emergency dental care. [39] Ferreira et al. reported acupuncture to be very effective in the management of trismus and facial paralysis following chemotherapy and radiotherapy on medulloblastoma. [40]

The advantages of acupuncture induced anesthesia are:

- Minimal post-operative pain and has fewer side effects or serious complications, equipment is inexpensive, no post-operative numbing effect, no nausea or vomiting, does not potentiate antihypertensive drugs, or non-interaction with any drug intake in patients taking medications for acute and chronic diseases, absence of dysgeusia, xerostomia, and absolute safety in pregnant patients and patients with autoimmune diseases. Acupuncture also does not injure the major nerves and blood vessels, thus minimize the incidence of iatrogenic trauma. However, certain disadvantages may preclude the routine use of acupuncture anesthesia, such as lengthy induction time, bleeding, and unresponsiveness. The results of the present study accepted the null hypothesis endorsing the equality of effectiveness between the subperiosteal infiltration technique and the acupuncture technique in securing anesthesia during mandibular posterior tooth preparation. The respondents rated both the anesthetic techniques to be equally effective with no statistically significant difference (P > 0.05). The split-mouth design incorporated in this study eliminated the inter subjective bias and blinding was followed where the investigator and operator were blinded. There were no dropouts in the study and no complications of anesthetic delivery observed. All the patients recovered from the anesthesia provided by acupuncture immediately after the needles were removed. The anesthetic effect of subperiosteal infiltration did not include soft tissues. The need for rescue anesthesia in cases of failure of anesthetic technique was not encountered in this study. The clinical significance of this study includes the preference of acupuncture anesthetic technique in situations where nerve block or infiltration is conventionally administered. This will have profound advantages of localized anesthesia over the operating site, absence of numbness in soft tissue, tongue, and other potential complications of nerve paresthesia, hematoma, trismus which are commonly encountered during the nerve block local anesthetic techniques, thus ensuring additional safety during dental operative procedures.

**CONCLUSION**

This study inferred acupuncture anesthesia has equal anesthetic effectiveness to subperiosteal infiltration anesthesia in controlling hyperesthesia (DH) during tooth preparation. Hence, acupuncture anesthesia can be utilized in clinical situations contraindicating local anesthetic agents.

**REFERENCES**


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