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Research Article

Q1 Comparison of Acupuncture with Ibuprofen for Pain Management in Patients with Symptomatic Irreversible Pulpitis: A Randomized Double-Blind Clinical Trial

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Abstract

Emergency pain management in symptomatic irreversible pulpitis commonly includes use of nonnarcotic analgesics. Acupuncture has been used in dentistry to alleviate pain after tooth extraction. The aim of this randomized, double-blind, placebo controlled clinical trial was to evaluate and compare the efficacy of acupuncture therapy and ibuprofen for pain management in such patients. A total of 157 patients participated in this study and were randomly assigned to three groups, Group I—classical acupuncture with placebo tablet, Group II—sham acupuncture with placebo tablet, and Group III—sham acupuncture with ibuprofen. Before commencement of the experiment, initial pain assessment was done using a HP-VAS scale. Treatment was done by first operator, while pain assessment was done by the second operator who was blinded to the procedure performed. Acupuncture needles were inserted for 15–20 minutes at acupoints for classical acupuncture and at nonacupoints for sham acupuncture. Posttreatment pain assessment was carried out at 15, 30, 45, and 60 minutes intervals. Follow-up analysis was recorded at 12, 24, and 48 hours using VAS verbal scale. The mean final HP VAS values for Group I showed statistically significant lower pain values when compared with groups II and III

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($p < 0.05$), with no significant difference between groups II and III. Follow-up analysis showed Group I with higher percentage of no pain, which was statistically significant when compared with other two groups. It can be concluded that classical acupuncture is more effective in pain relief (faster and prolonged) than analgesics.

Q4 1. Introduction

Pain is one of the most common reasons patients seek dental treatment [1]. Pain of pulpal origin (irreversible pulpitis) is most feared among patients due to its intensity and severity [2]. This severity is most likely because of increased exudative (acute) forces that cause an increase in the intrapulpal pressure within the closed, unyielding pulpal space that surpasses the threshold limits of sensory fibers [3]. Since pain is subjective and is influenced by various factors other than local factors such as physical and psychological, standardizing and quantifying pain is very challenging [4]. This is particularly true for endodontic pain in patients with symptomatic irreversible pulpitis and/or apical periodontitis. Once the diagnosis is done, initiation of endodontic therapy is the first treatment option, which may not be always possible during emergency situations. Therefore, a pain management strategy is employed that usually involves pharmacological drugs such as nonnarcotic analgesics and opioids. The most commonly used nonnarcotic analgesics are ibuprofen, paracetamol, and aspirin. Although nonsteroid antiinflammatory drugs (NSAIDs) such as ibuprofen are extremely effective having both analgesic and antiinflammatory actions, it has several undesirable side effects [1]. Moreover, these oral medications may have lower absorption rate and/or take a longer time to act [5].

Nonpharmacological approach such as acupuncture has been used in dentistry to reduce anxiety during treatment to alleviate postoperative pain after tooth extraction [6]. Acupuncture is the stimulation of specific points on the skin, usually by the insertion of one or more specialized needles. The principle of acupuncture is based on vital force or energy known as "Qi" (pronounced as "chee"), which circulates between the organs along channels called "meridians". The acupuncture points are located along these meridians and are thought to correspond to physiological and anatomical features such as peripheral nerve junctions [7].

In dentistry, acupuncture has been used in the management of temporomandibular disorders, facial pain, postoperative pain, especially when the use of NSAIDs is contraindicated because of concomitant systemic medication or gastric ulceration. [6, 8–10]. Lao et al (1999) showed that acupuncture is superior over placebo acupuncture in preventing postoperative pain that arises due to dental extractions [6]. Gross and Morse. attempted a preliminary clinical study in 1976 in which acupuncture was used for analgesia in 10 endodontically involved teeth. The results showed only one of the cases allowed pain-free pulpal extirpation and instrumentation, while no analgesia resulted in two cases [11]. Selden and Allentown (1978) conducted a clinical study on the effect of acupuncture

stimulation on pain perception modification for various conditions encountered in dental practice [12]. They found that acupuncture was effective in relieving pain of dental origin, and more than 90% patients had relief from pain for short and longer duration as well.

The molecular mechanism of acupuncture needling involves the release of molecules such as opioids, cholecystokinin octapeptide, 5-hydroxytryptamine, noradrenalin, gamma-aminobutyric acid (GABA), and substance P [13]. These molecules block the incoming pain information through the release of neurotransmitters such as serotonin, norepinephrin, GABA which reduces pain subsequently [14, 15]. A recent study by Leung et al (2005) showed increased analgesia with activation of $A\delta$ -type afferents by acupuncture. Further studies have shown that C fibers also have a role in acupuncture analgesia. [13, 16].

However, there are no studies evaluating the use of acupuncture for preoperative pain management in endodontics. Hence, the aim of this randomized double-blind placebo controlled clinical study was to evaluate and compare the efficacy of acupuncture in alleviating pain in patients with symptomatic irreversible pulpitis as compared to ibuprofen medication at different time intervals and follow-up over a period of 48 hours.

2. Materials and methods

The study was designed as a randomized double-blind clinical trial. The study protocol was presented to the Institutional Ethical Committee, SRM Dental College, SRM University and approval was obtained (File No: SRMU/M&HS/SRMD/2010/M.D.S-PG Student/304). A total of 157 patients within the age group of 18–49 years participated in this study. These patients reported to the Department of Endodontics with moderate to severe pain (HP-VAS > 54) and were diagnosed as having symptomatic irreversible pulpitis. The risks and benefits of the acupuncture procedure and of their participation in the study were explained and written informed consent was obtained from each patient.

Exclusion criteria included periapical pathology, history Q5 of previous medications, patients of ASA class III and above, pregnant or lactating women, and patients with history of gastritis, asthma, and allergy to NSAIDs.

Once the diagnosis of symptomatic irreversible pulpitis was done, preoperative pain was evaluated using HP-VAS scale. The Heft-Parker combined metric scale (HP-VAS) that provides the patients with multiple cues for pain determination was used in this study [17]. To interpret the data, the HP-VAS (a 170 mm line with several descriptive terms) was divided into four categories:

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