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Effect Of Preoperative Aceclofenac On The Success Of Inferior Alveolar Nerve Block In Patients With Irreversible Pulpitis

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Abstract
Introduction: The purpose of this prospective, randomized, placebo-controlled study was to determine the effect of the administration of preoperative aceclofenac on the success of the inferior alveolar nerve block (IAN) in patients with irreversible pulpitis. Methods: Forty endodontic outpatients diagnosed with irreversible pulpitis of a mandibular posterior tooth were randomly administered capsules of either 100mg aceclofenac or placebo 45 minutes before the administration of a conventional IAN block. Endodontic access preparation was begun 15 minutes after completion of the IAN block, and all patients had profound lip numbness. Success was defined as no or mild pain (visual analogue scale recordings) on access or initial instrumentation. Data were analyzed by the chi-square and independent t test. Results: The success rate for the IAN block was 65% with aceclofenac and 35% with placebo, with a significant difference between the 2 groups (P-value < 0.01).Conclusions: Premedication with aceclofenac given 45 minutes before the administration of the IAN block significantly increased the anesthetic success rates in patients with irreversible pulpitis.

Key Words
Aceclofenac, inferior alveolar nerve block, irreversible pulpitis

INTRODUCTION

The inferior alveolar nerve block (IAN) is the most frequently used mandibular injection technique for achieving local anesthesia for endodontic treatment. However, the IAN block does not always result in successful pulpal anesthesia. Clinical studies in endodontics have found failure with the IAN block occurring between 44% and 81% of the time in patients with irreversible pulpitis[1,2]. Various mechanisms have been hypothesized to explain the failure of local anesthetics including anatomic variations like cross innervations and accessory innervations, decreased local pH, tachyphylaxis of anesthetic solutions, and activation of nociceptors like tetrodotoxin (TTX)[3,4].

Many researchers have identified inflammation as an important component of the pathogenesis of hyperalgesia and failure of local anesthesia. Because NSAIDs reduce nociceptor activation by decreasing the levels of inflammatory mediators, it is hypothesized that premedication with NSAIDs will affect the success rate of local anesthesia in patients with irreversible pulpitis[5]. Aceclofenac used in the present study is a phenyl acetic acid derivative and an effective analgesic and anti-inflammatory agent. It is a potent inhibitor of enzyme cyclooxygenase which is involved in production of prostaglandins.

Previous investigations using analgesics before administering inferior alveolar nerve (IAN) block have reported conflicting results. For example, in 2006,Modaresi [6] reported significant improvements in the success rate of IANB in teeth with inflamed pulps after the use of ibuprofen, acetaminophen-codeine and placebo premedication therapy. Ianiro[7] reported higher success rates although they were not significantly different with acetaminophen and acetaminophen-ibuprofen combination. Aceclofenac is not used in any of the previous studies. The use of aceclofenac to provide potential increased effectiveness for the IAN block needs further investigation to confirm its effectiveness.
The purpose of this randomized, placebo-controlled study was to evaluate the effect of premedication of aceclofenac on anesthetic success rate in terms of reducing pain during endodontic procedures.

Materials and Methods

40 adult patients participated in the study were all outpatients of department of Conservative dentistry, VMSDC, Salem. They were randomly assigned into two groups of twenty subjects each: Group I were administered 100 mg aceclofenac (altraflam,ranbaxy).group II were given placebo with sugar coated pills. Exclusion criteria were as follows: subjects who were younger than 18 years; had allergies or were unable to take aceclofenac; were allergic to local anesthetics; were pregnant or nursing; had a history of significant medical conditions; or were unable to give informed consent. The patients included had not taken any analgesics for at least 8 hours before enrollment in the study, and written informed consent was obtained from each patient.

To qualify for the study, each patient had a vital mandibular posterior tooth (mainly first and second molar), was actively experiencing pain, and had a prolonged response to cold testing with Green Endo-Ice. Patients with no response to cold testing, periradicular pathosis, or no vital coronal pulp tissue on access were excluded from the study. Therefore, each patient had a tooth that fulfilled the criteria for a clinical diagnosis of irreversible pulpitis.

Each patient rated his or her initial pain on a **Heft-Parker visual analogue scale (VAS)**[8] (Fig.1)

The VAS was divided into 4 categories. No pain corresponded to 0 mm. Mild pain was defined as greater than 0 mm and less than or equal to 54 mm. Mild pain included the descriptors of faint, weak, and mild pain. Moderate pain was defined as greater than 54 mm and less than 114 mm. Severe pain was defined as equal to or greater than 114 mm. Severe pain included the descriptors of strong, intense, and maximum possible. Patients also completed a Corah dental anxiety scale 9 to rate their level of anxiety. Corah developed a 4-item questionnaire that asks patients about 4 dentally related situations. The scale yields a score ranging from 4-20.

Forty-five minutes after administration of the capsules (1oomg aceclofenac / placebo) standard IAN block and long buccal injection were administered. Two 1.8-mL cartridges of 2% lidocaine with 1:100,000 epinephrine (Xylocaine; Astra Zeneca LP, Dentsply, York, PA) were given for the IAN block, and 0.9 mL of lidocaine with 1:100,000 epinephrine was given for the long buccal injection. After the IAN block, the patient was questioned for lip numbness every 5 minutes for 15 minutes. If profound lip numbness was not recorded in 15 minutes, the block was considered missed, and the patient was eliminated from the study. No subjects were eliminated in this study as a result of lack of lip numbness.

At 15 minutes after injection (ie; 60 minutes after administration of aceclofenac or placebo capsules), the teeth were isolated with a rubber dam, and endodontic access was performed. If the patient felt pain, treatment was immediately stopped, and the patient rated their discomfort by using the Heft-Parker VAS[8].

The success of the IAN block was defined as the ability to access and instrument the tooth without pain (VAS score = 0) or mild pain (VAS rating less than or equal to 54 mm). The patients who had moderate or severe pain (VAS rating greater than 54 mm) during access into dentin or when entering the pulp chamber received a supplemental buccal infiltration injection with 4% articaine. After removal of the rubber dam, a standard infiltration injection was administered buccal to the tooth under treatment. After waiting 5 minutes for the infiltration to take effect, the rubber dam was replaced, and endodontic access was continued.

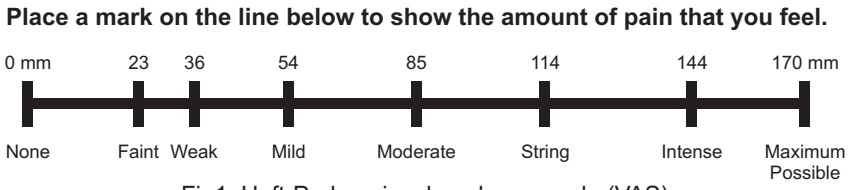

Fig1: Heft-Parker visual analogue scale (VAS)

The data from this study were collected and statistically analyzed. Comparisons between the aceclofenac and placebo groups for anesthetic success, gender, recent food intake, tooth type, Corah dental anxiety scale, age, and initial pain ratings were analyzed by using independent t test. Anesthetic success was analyzed using chi square test. Comparisons were considered significant if P value <.05.

Results

The gender, age, initial pain, tooth type and corah dental anxiety ratings[9] of the patients are presented in table 1 and there was no statistical difference between the both groups. However, there was a significant difference between both groups in terms of anesthetic success. IAN block success was 65% for the aceclofenac group and 35% for the placebo group (P Value - .04763).

	Aceclofenac Group	Placebo Group	P-Value
Total Subjects	20	20	
Gender	M -12/20 F - 8/20	M -11/20 F - 9/20	0.30736
Age	30.4 ± 9.832	31.7± 8.933	0.33207
Initial Pain	95.2 ± 19.874	100.25 ± 13.452	0.17672
Dental Anxiety Scale	10.6 ± 1.3138	11.25± 2.245	0.13622
Tooth Type	IMOLARS - 60% II MOLARS- 40%	IMOLARS-70% IIMOLARS-30%	0.50736
IAN Block Success	65 %	35 %	**0.04763**

Discussion

The patients' age, gender, initial pain, tooth type, and anxiety ratings were not significantly different between the aceclofenac and placebo groups .Therefore, the effect of age, gender, initial pain, tooth type, and anxiety rating would be minimized between the two groups. The mean initial pain ratings of 96 for the aceclofenac group and 100 for the placebo group would correlate to moderate pain on the VAS. This pain is representative of patients with an irreversible pulpitis. The mean anxiety ratings in the current study were similar to the results of Lindemann[10], who also studied patients with irreversible pulpitis.

If an analgesic decreases the amount of prostaglandins[5], it might be able to increase the efficacy of local anesthetics. Aceclofenac(altraflam100mg,ranbaxy) used as a premedication in this study are relatively safe, fast-acting analgesics that control inflammation ,also they had not been used before in a similar study.

Aceclofenac[5] is a potent inhibitor of enzyme cycloxygenase which is involved in production of prostaglandins. They also inhibit synthesis of IL-1, tumor necrosis factor and PGE2 production. Thus one might conclude that because aceclofenac

reduces the amount of prostaglandins, there might be an increase in the efficacy of local anesthetics.

In 2006 Modaresi[6] advocated premedication with ibuprofen and acetaminophen-codeine for achieving deep anesthesia in patients with irreversible pulpitis. They evaluated the depth of anesthesia with the help of electric pulp tester, but did not evaluate the success or failure rate on basis of pain during root canal treatment. According to Modaresi[6] and Ianiro[7], the preoperative administration of ibuprofen increased the effectiveness of the IAN block. In the present study, effect of premedication with aceclofenac was studied by using pain response on modified Heft Parker VAS. Premedication was given 45 minutes before the procedure to allow NSAIDs to achieve satisfactory plasma concentration.

In the present study, aceclofenac group gave 65% anesthetic success rate while placebo group gave 35% success rate, which is comparable with previous studies (Aggarwal[11], Nusstein[12]). Thus premedication with aceclofenac does significantly increase the success rate (65%) in the present study.

CONCLUSION:

In conclusion, for mandibular posterior teeth, 100 mg of aceclofenac given 45 minutes before the administration of the IAN block resulted in a significant increase in IAN block success in patients with irreversible pulpitis.

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