

## ORIGINAL RESEARCH

# Effect of preoperative oral medication of aceclofenac, flurbiprofen, ketorolac vs placebo on the success of inferior alveolar nerve block in patients with irreversible pulpitis

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## Abstract

**Aim and objectives:** The aim of the present study is to compare the effect of oral pre operative aceclofenac, flurbiprofen, Ketorolac vs placebo on the success of inferior alveolar nerve blocks (IANB) in patient with irreversible pulpitis.

**Material and methods:** For this study, 40 patients with irreversible pulpitis of mandibular posterior teeth were divided into 4 groups Group 1: aceclofenac, group 2: flurbiprofen, group 3: ketorolac and group D: placebo after assessing the pain scores using visual analogue scale. Medication was given 30 minutes before the procedure and IANB was administered using 2% Lignocaine. Signs of anesthesia was assessed after 15 minutes following which teeth were tested with cold spray. Access cavities were prepared and success of IANB was assessed as absence of pain during procedure.

**Results and Conclusion:** the results showed increased depth anesthesia when preoperative NSAIDs were given as compared to placebo.

**Keywords:** MRI, junctional zone, adenomyosis.

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## INTRODUCTION

Pain related to endodontic treatment can be annoying and perplexing problem to the patient and dental surgeon. Though it may not indicate endodontic failure, relief of it is more important than success and failure of treatment. Various methods have been used to control pain such as local anesthesia, analgesics, corticosteroids etc. Local anesthesia with 2% lignocaine and adrenaline is primary method to control pain during endodontic procedures. However its success rate is decreased in patients with symptomatic irreversible pulpitis(1). This can be due to inflammation which is mediated via prostaglandins (PGs), causing sensitization of nerve endings to bradykinin and histamines leading to pain and tenderness. Secondly it can be due to anatomic variations such as cross innervations or accessory innervations. Third due to decrease local pH and Activation of nociceptors including tetrodotoxin and capsaicin sensitive transient receptor potential of vanilloid type 1(2). NSAIDs reduce nociceptor activation by decreasing levels of inflammatory mediators, therefore it is hypothesized that premedication with NSAIDs affect the success rate

of local anesthesia in patients with irreversible pulpitis. Traditional NSAIDs act by non selective inhibition of COX activity, leading to gastrointestinal complications. However, Selective COX 2 inhibitors have been developed to provide pain relief same as that of non selective NSAIDs but with no gastrointestinal risk.

## METHOD

Forty adult volunteer subjects were selected in age group of 21-40 years with symptomatic irreversible pulpitis in mandibular molars.

Inclusion criteria includes

1. healthy patients having pain in mandibular molars with prolonged response to cold test and lingering pain for more than 45 seconds,
2. teeth with vital pulp, absence of periapical radiolucency on radiographs, but not widened periodontal ligament (not more than 0.75–1 mm) and
3. patients with the ability to understand the use of pain scales.

Exclusion criteria includes H synthase which gets converted into eicosanoids which further produces 5 biologically active PGs such as PGD<sub>2</sub>. COX consist of

two inducible forms COX -1 and COX -2. COX - 1 present in high levels in cells and tissues which

1. Patients allergic, sensitive or having contraindications to any opioid or nonopioid analgesics including aspirin or NSAIDs;
2. Patients having history of active peptic ulcer within the last 12 months, or bleeding problems or use anticoagulant within the last month, or known or suspected drug abuse;
3. Patients taking opioid, nonopioid analgesics, steroids, antidepressants or sedatives within 12–24 h before giving the study drugs; and
4. pregnant or breast feeding patients

#### Patients were randomly divided into 4 groups

Group 1: patients given aceclofenac

Group 2 : patients given flurbiprofen

Group 3: patients given ketorolac

Group 4: placebo

**After taking the informed consent patients were asked to rate their pain on Visual analogue scale (VAS)(3). The scale was divided into four categories:**

Category 1 : no pain corresponded to 0 mm;

Category 2 : faint or mild pain corresponded to 1-4 mm;

Category 3 : moderate to severe pain corresponded to 5 - 7mm;

Category 4: strong, intense, maximum possible pain corresponded 8 – 10.

Medication was given to all patients 30 min before administration of inferior alveolar nerve block (IANB) . Standard IANB injections using 1.8 mL of 2% lidocaine containing 1 : 200 000 epinephrine were given. After 15 min of the initial IANB, each patient was asked Presence of lip numbness Assessment of pain on access cavity preparation and instrumentation. Success of IANB was defined as no pain during endodontic access preparation and root canal instrumentation. Patients were asked to rate their pain on VAS scale.

#### RESULTS

It was found that there was significant difference in post injection mean VAS score. Group I, II, III resulted in significantly lower mean VAS score than Group IV.

Percentage of successful IAN blocks were

1. Group I: 50%
2. Group II: 60%
3. Group III: 50%
4. Group IV: 30%

Premedication with aceclofenac gave success rate of 50%. Predication with flurbiprofen had 60% success rate whereas ketorolac had 50% success rate. None of the groups gave 100% success rate.

#### DISCUSSION

In irreversible pulpitis there is inflammation of pulp which leads to breakdown of damaged cell membranes releasing arachidonic acid (AA) which is mediated by either secretory or cytoplasmic phospholipases. Due to

various inflammatory stimuli, AA is acted on by COX or prostaglandin H synthase which gets converted into eicosanoids which further produces 5 biologically active PGs such as PGD<sub>2</sub>, PGE<sub>2</sub>, PG<sub>2</sub> alpha, Prostacycline and thromboxane TxA<sub>2</sub>. PGs sensitize nerve endings to bradykinins and histamines causing pain and tenderness. COX consist of two inducible forms COX -1 and COX -2. COX – 1 present in high levels in cells and tissues which causes synthesis of prostanoids and have cytoprotective effect. COX – 2 induced by mediators of inflammation such as lipopolysaccharide, IL- 1 and TNF. NSAIDS such as aceclofenac effectively block COX pathway and inhibit formation of PGs and minimizing the activation of nociceptors. Pre treatment administration of flurbiprofen prevents sensitization of peripheral nociceptors, which minimize CNS input. It inhibits PGs synthesis which leads to less pain from manipulations in the root canal. Ketorolac inhibits PG synthesis and relieves pain by peripheral mechanism Prasanna, et al. 2010 determined the effect of pre operative administration of lornoxicam and diclofenac potassium on the success of IANB in patients with irreversible pulpitis and found no significant differences between the groups(4). Flath RK, et al.1987 evaluated clinically the effectiveness of pre operatively administrated flurbiprofen in suppressing post endodontic pain. (5). Patients who received medication reported less pain as compared with patients exhibiting placebo. Hence it can be given before starting endodontic procedure in patients with irreversible pulpitis to achieve deep anesthesia. Aggarwal V, et al. 2010 studied the efficacy of IANB after administration of ketorolac and ibuprofen and found that success rate of ibuprofen was 27% and for ketorolac it was 39% (6).

#### CONCLUSION

This study suggests preoperative administration of NSAIDS increased the success rate of IANB in achieving deep pulpal anesthesia during endodontic treatment which ensure the patient a comfortable experience. However its contraindication should be considered when given to patients.

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