



EVALUATION OF THE EFFICIENCY OF INTRALIGAMENTARY DICLOFENAC SODIUM IN REDUCING POST OPERATIVE ENDODONTIC PAIN IN PATIENTS WITH IRREVERSIBLE PULPITIS

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ABSTRACT

Management of pain is the key to success in endodontic treatment. Diclofenac Sodium is the most commonly prescribed and most effective when administered to patients with irreversible pulpitis. The primary mechanism responsible for its anti-inflammatory and analgesic action is due to the suppression of the cyclo-oxygenase pathway by inhibition of prostaglandin synthesis. However, the traditional oral route is less commonly preferred as gastrointestinal complaints are more pronounced. In this study 52 patients with irreversible pulpitis are randomly divided into 2 groups. The active group is given intraligamentary injection totaling 0.4ml of Diclofenac Sodium while the placebo group received the same amount of Lidocaine. Single visit endodontic therapy is performed by the same endodontist. Visual analogue scale will be used to score pain before treatment and 4,8,12,24,48 hrs postoperatively. The prime focus of this randomized double blinded study was to evaluate the analgesic efficacy of Diclofenac Sodium through the intraligamentary route in reducing post treatment endodontic pain. Prophylactic intraligamentary injection of 0.4ml of 30 mg of Diclofenac Sodium was found to be highly effective in reducing post-endodontic pain of vital teeth with irreversible pulpitis during the first 48 h. It was much more effective than a similar Lidocaine injection in reducing postoperative endodontic pain.

Keywords: Irreversible pulpitis, Endodontic pain, Diclofenac Sodium, Vital teeth.

INTRODUCTION

Successful management of dental pain is the primary goal of all dental clinicians. Numerous factors have been enumerated as causes for post-endodontic pain¹. Post endodontic pain is a disappointing setback for both the patient as well as the clinician as it questions the ability of the clinician to perform endodontic procedures successfully. Various techniques have been advocated for reducing pain such as long acting local anesthetics, opioids, glucocorticoids and non steroidal anti inflammatory drugs². Non steroidal anti-inflammatory drugs have been the traditional treatment for moderate pain. The Non steroidal anti-inflammatory drug, Diclofenac Sodium is known to act by inhibition of prostaglandin synthesis by inhibition of the Cyclo-oxygenase pathway. It also appears to exhibit bacteriostatic activity by inhibiting bacterial DNA synthesis³. The action of one single dose is much longer (6 to 8 hr), than the very short half-life of the drug indicates. This could be partly because it persists for over 11 hours in tissue fluids⁴. Kaufman et al reported a 79% success rate in providing endodontic pain relief when intraligamentary technique was used to administer anesthesia while performing vital pulpectomies. This technique was usually used by dentists earlier to avoid the mandibular block, given the fact that all dentists have experienced periods when they have been unable to achieve adequate anesthesia with the inferior alveolar nerve block⁵. The purpose of the present study was to evaluate the effect of a single intraligamentary injection of Diclofenac Sodium on postoperative pain associated with endodontic procedures.

MATERIALS AND METHODS

52 patients who visited the Department of Conservative Dentistry & Endodontics, A.B. Shetty Memorial Institute of Dental Sciences; Mangalore were enrolled for the study. The research was approved by the institutional review board or

ethics committee in accordance with national and international guidelines and regulations. (ABSM/EC/82/2012).

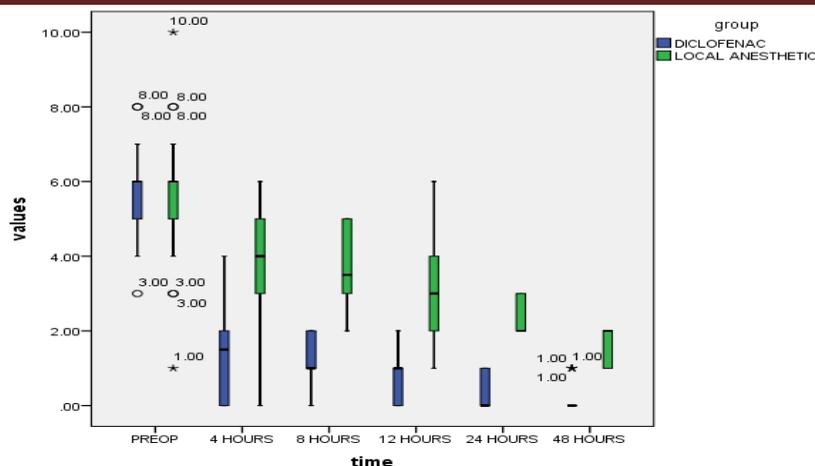
The Selection of patients was done on the basis of Inclusion and exclusion Criteria. The inclusion criteria was:

- Irreversible pulpitis of mandibular molar teeth.
- Vital teeth with no history of previous root canal therapy.
- Teeth with normal periodontium which were not sensitive to percussion and had no periapical radiolucency.
- Teeth that could be treated endodontically in one visit.

The exclusion criteria considered was:

- Known hypersensitivity to Diclofenac Sodium.
- Pregnancy and lactation.
- High risk cardiac patients & Cardiac patients who have undergone surgeries in the past 6 months.
- History of systemic infections.
- Child patients who developed asthma or allergy to anti-inflammatory drugs.
- History of peptic ulceration.

Fifty two patients with irreversible pulpitis were randomly divided into two groups. All patients were anesthetised with standard injections with 1.8ml of 2% lidocaine containing 1:80,000 epinephrine. The experimental group received intraligamentary injections totaling 0.4 ml(30mg) of Diclofenac. The control group received the same amount of intraligamentary lidocaine. Single visit endodontic therapy was performed by the same endodontist. Visual Analogue Scale was used to record pain before treatment and 4, 8, 12, 24 and 48 h postoperatively. The decrease in the intensity of post treatment pain was recorded and statistically analysed using Mann-Whitney U test.



RESULTS

Over a period of 5 months, patients were screened for possible participation in the study. A total of 52 patients were included in the study. The similarity of groups, were confirmed by analysing preoperative pain intensity distribution. There was no significant difference regarding the baseline (preoperative) pain intensity between two groups. The intensity of pain in the Diclofenac Sodium and placebo groups at each time interval is presented in the graph. In both groups, statistically significant decrease in postoperative pain intensities existed

DISCUSSION

Adequate local anaesthesia eliminates pain during treatment, but considerable discomfort is expressed occasionally post endodontic treatment⁶. According to Harrison et al., postoperative pain was more likely to occur in symptomatic patients within the first 24 h following root canal therapy. Several reviews have demonstrated that non steroidal anti-inflammatory drugs produce excellent analgesic responses in patients who can tolerate these drugs^{7,8}. With onset of action of Diclofenac Sodium being 10 minutes and with a half life of 8 hrs wherein it persists in the tissue fluid for more than 11 hours⁴; it could favorably overcome the pain of post-endodontic treatment. The major problem associated with anesthetizing teeth in patients with irreversible pulpitis is that voltage gated sodium channels are relatively resistant to local anesthetics. Also these channels are sensitized by prostaglandins which suggest that the use of non steroidal anti-inflammatory drugs may be useful as pretreatment to enhance the efficacy of local anesthetics in patients with odontogenic pain^{8,9}. The sensitization of tetrodotoxin resistant channels by prostaglandins lowers the activation threshold and increases the amount of sodium ions that flow through the channel¹⁰. Supplemental injection of local anesthetic has also been tried but without any significant result. The present study was done with a supplemental local injection of Diclofenac Sodium along with local anesthetic block which not only reduced the pain during the procedure but the post operative pain was found to be significantly reduced. This significant reduction of pain in patients administered with Diclofenac Sodium was due to the known anti-inflammatory action of Diclofenac Sodium as it helps in inhibiting the inflammatory mediators thereby causing reduction of pain. Diclofenac Sodium given orally is known to cause gastrointestinal discomfort. Hence administration of the drug through this route rules out that complication. However a few

complications have also been associated with intraligamentary injection such as swelling and discolorations of soft tissues at the injection site, and prolonged ischemia of the interdental papilla followed by sloughing and exposure of the crestal bone⁵. The most common causes of post-injection discomforts are due either rapid injection or injection of excessive volumes of local anesthetic into the site⁵. But in this present study no such complications or discomfort were reported by the patients.

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