

EVALUATION OF PAIN AFTER ADMINISTRATION OF LOCAL ANESTHESIA WITH AND WITHOUT MEDICATION (MIDAZOLAM) IN IRREVERSIBLE PULPITIS IN A SAMPLE OF SINDH

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ABSTRACT

The objective was to evaluate pain experience of the patient after administration of local anesthesia in symptomatic irreversible pulpitis with and without pre-medication

Patients were diagnosed after taking medical and dental history, clinical examination, thermal tests and by taking radio-graphs. One hundred patients formed the study group. They were divided into two groups of fifty each, Group-A patients were given oral medication (Midazolam, Dormicum 7.5mg) and inferior dental nerve Block, while Group-B patients were given only Inferior Alveolar Nerve (IAN) Block (1.8 ml cartridge-1:100000 epinephrine) of Xylestesin-S (ESPE-Germany) without any pre-medication. Pre-operative pain of patients of both groups was recorded on Visual Analogue Scale (VAS) i.e. 0= no pain, 10 = most severe pain. (VAS 0>10) Group-A patients were given anesthesia 45 minutes after pre medication while Group-B, patients were treated routinely after administering inferior dental nerve Block block.

In group A (40% showed no pain, 44% mild pain, 12% moderate pain and 4% suffered severe pain n=50) while in group B (20% showed no pain, 50% mild pain, 20% moderate pain and 10% suffered from severe pain after the procedure was done.

It was concluded that the patients who had received sedation, prior to anesthesia showed better results.

Key Words: Local anesthesia, Midazolam, Irreversible pulpitis.

INTRODUCTION

Inability to achieve profound anesthesia in the patient with irreversible pulpitis remains an important barrier to successfully treating patient through endodontics and other procedures. Local anesthesia failure in patient with irreversible pulpitis is attributed to pulpal and periapical inflammation and infection which may lower the tissue pH in the affected region.^{2,5} It has been hypothesized that inflammation products enhance nerve conduction.⁴ Unusual vasodilation caused by inflammation may also lead to systemic uptake of anesthetic solution from the local site of infiltration, thus, reducing its effectiveness.¹ Conventional anesthetic technique do not always provide profound pulpal anesthesia. Failure of local anesthesia is usually associated with mandibular molars and pre molars with Inferior Alveolar Nerve (IAN) block.² Apart from above mentioned failure causes, the patients in pain are often anxious and fearful of dental treatment.⁷⁻⁹ Perhaps the use of conscious sedation may reduce pain and may

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make Root Canal Treatment (RCT) more acceptable to the patient.⁶

It has been suggested that variations in the pharmacology of the benzodiazepine used to administer the sedation can markedly affect the success of calming effect in endodontic patients.¹⁰ Benzodiazepine is an effective anxiolytic agent for the patients who require endodontic treatment. Midazolam is a short-acting and short-duration (3-8 hr) pharmacological agent which is gaining attention of researchers to overcome the failure problems associated with inferior alveolar nerve.^{11,12} Midazolam is a hypnotic-sedative drug with anxiolytic and marked amnestic properties.¹³ To date it has been used mostly by the intravenous route, for sedation in dentistry and endoscopic procedures and as an adjunct to local anesthetic techniques. It has proved less reliable than thiopentone, but preferable to diazepam, as an intravenous induction agent and is unlikely to replace the other well established drugs.¹⁴ Regardless the skills of clinician, RCT cannot be initiated without effective pain control. Until now no significant study has been performed locally to evaluate patient's response to local anesthesia, its failure or any alternative to control pain therefore the purpose of the present study was to evaluate patient's pain experience after administration of local anesthesia in symptomatic irreversible (painful) pulpitis with and without pre-medication to find scientific basis to control pre-operative pain as it will be helpful for both clinicians and patients as well.

METHODOLOGY

This was a comparative cross sectional study, conducted at department of Operative Dentistry, Dental OPD, Liaquat University Hospital, Hyderabad from May 2013 to November 2013. The patients were selected with convenient sampling. The patients were actively experiencing pain and were in good health, and none were taking any medication that would alter pain perception, determined by oral and written questionnaire. An ethical clearance was sought from the institute review committee, and an informed written consent was obtained from each subject.

Preoperative radiographs were taken. The inclusion criteria were fourteen to eighteen years old patients of either gender suffering from irreversible pulpitis of mandibular molars and premolars, and showed prolonged response to cold testing with an ice stick and an electric pulp tester (Kerr, Analytic Technology Corp, Redmond, WA), absence of any peri-apical radiolucency on radiographs, except for a widened periodontal ligament and a vital coronal pulp on access opening, and ability to understand the use of pain scales. Exclusion criteria were the patients having teeth with immature roots, contraindications to any opioid or non-opioid analgesic including aspirin or NSAIDs, history of active peptic ulcer within the preceding 12 months, history of bleeding problems or anticoagulant use within the last month, mentally retarded patients, known hypertensive/ allergic patients and patients with known hepatic impairment, patients who were pregnant or breast-feeding with a history of known or suspected drug abuse and patients who had taken sedative/ hypnotic drug within 12 hours before administration of the study drugs.

Before starting RCT Group-A patient were given oral medication (Midazolam, Dormicum 7.5mg) and Group-B patients were given only inferior alveolar nerve block (1.8 ml cartridge-1:100000 epinephrine) of xylestesin-S (ESPE-Germany) without any medication. Pre-operative pain of patients of both groups was recorded on Visual Analogue Scale (VAS) i.e: 0= no pain, >0 = painful. RCT of group-A patients was started 45 minutes after pre medication while Group-B, patient were treated after administering inferior alveolar nerve block. Patients were instructed to definitively rate any pain felt during the endodontic procedure. If the patient felt pain, the treatment was immediately stopped, and the patient rated their discomfort by using the Heft-Parker VAS. The extent of access achieved when the patient felt pain was recorded as within dentin, entering the pulp chamber, or initial file placement.

SPSS version 16 was used to analyze the available data, Mean $\pm$ SD was presented for age of the patient, Male: Female ratio was presented for gender distribu-

TABLE 1: SEVERITY OF PAIN ACCORDING TO GENDER

Gender	Types of pain				Total	P-value
	No pain	Mild pain	Moderate pain	Severe pain		
Male	1 100.0%	24 100.0%	15 30.6%	0 .0%	40 40.0%	0.000
Female	0 .0%	0 .0%	34 69.4%	26 100.0%	60 60.0%	
Total	1 100.0%	24 100.0%	49 100.0%	26 100.0%	100 100.0%	

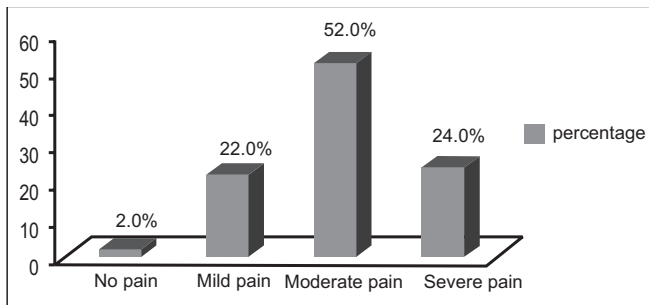


Fig 1: Distribution of pain in Group A patients with pre medication (midazolam) n=50

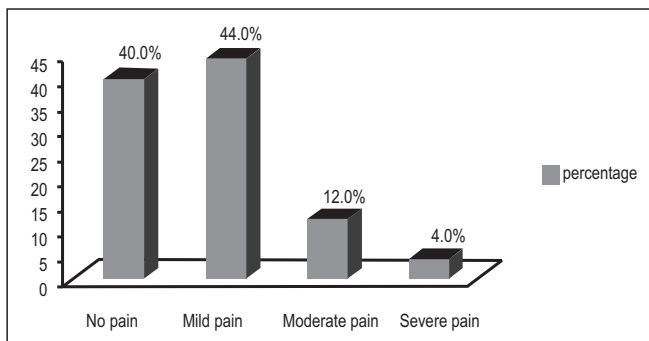


Fig 2: Distribution of pain in Group A patients after administration of L.A. n=50

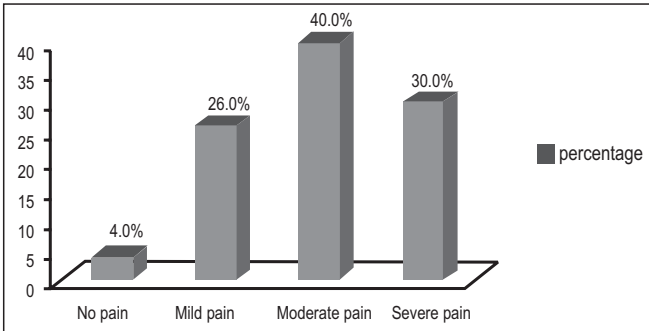


Fig 3: Distribution of pain in Group B patients without any medication n=50

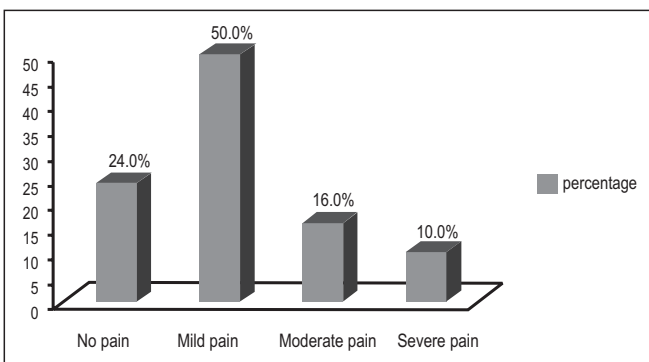


Fig 4: Distribution of pain in Group B patients after administration of L.A. n=50

tion. The variables were qualitative; Chi square test was used for testing the statistical differences between gender and type of pain. Pre and post medication pain was measured in percentage.

RESULTS

A total of 100 patients diagnosed with irreversible pulpitis were included in this study. The patients were between 14 and 50 years of age (mean age = 31.36.5 SD +1.15 years old). The female male ratio was 1:5. The type of pain reported in male gender was no pain to moderate pain while in females it was moderate to severe pain, which is statistically significant (Table 1). Details about severity of pain according to gender and distribution of pain in Group A & B can be seen in Table 1 and Fig 1-4.

DISCUSSION

The purpose of this trial was to determine the anesthetic efficacy with and without medication (midazolam) in inferior alveolar nerve block anesthetic technique. The studies of Abbott, N Leow¹⁵ ratio of females to males was the same as in this study. However this ratio was different in the study conducted by Claffey et al.¹⁶ The mean levels of experienced pain according to gender distribution, comparable results have been reported by Watkins et al.¹⁷ who found similar intra-operative pain levels in both sexes. Polycarpou et al.¹⁸ determined and concluded that female gender was an important risk factor. Khan et al.⁵ found significantly higher levels of mechanical allodynia, defined as reduced mechanical pain thresholds in women with irreversible pulpitis and acute peri-radicular periodontitis compared to men.

Some clinical studies have reported that a single inferior alveolar nerve block injection of local anesthetic is ineffective in 30-80% of patients with a diagnosis of irreversible pulpitis.^{10,12} Bigby et al.¹⁹ have proposed that when inferior alveolar nerve block fails to provide profound pulpal anesthesia, the intra-osseous injection of 4% articaine with 1: 100 000 epinephrine would be successful 86% of the time in achieving pulpal anesthesia in mandibular posterior teeth. This technique could be used regularly in root canal treatment of mandibular molar teeth in patients with irreversible pulpitis.

The results of this study agree with other studies and suggest that midazolam is an efficacious drug for sedation during outpatient oral surgical procedures. The use of anxiolytic medication does not reduce the need for local anesthetics during dental procedures. A study by Ehrich et al.¹¹ compared the single dose of 0.25 mg triazolam with 5mg of diazepam and 0.25 mg triazolam found to be more effective in reducing the patients anxiety.

CONCLUSION

It was concluded that systematically administered midazolam is effective in reducing postoperative pain with the administration of local anesthesia. Oral benzodiazepines may be used successfully with administration of local anesthesia to reduce mild, moderate and severe pain in irreversible pulpitis.

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