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Role of Drugs in Management of Pain and Anxiety arising from Diseases of Endodontic origin

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Abstract: *The primary aspect of resolving the chief complaint of a dental patient includes resolution of the pain related discomfort as well as eradicate the phobia often associated with going ahead with dental treatment. Dental patients often come with a preinstalled fear of anticipating pain during dental procedures which in turn leads to indecisiveness and apprehension. An important and often ignored aspect of treatment in such cases is to effectively allay patient anxiety and achieve effective pain control both preoperatively via premedication as well as during and after the procedure is finished. This is where come the role of adjunctive pharmacologic strategies to supplement the clinical treatment procedure and make the patient comfortable. The aim of this article is to explore the role of various drugs that help in pain and anxiety management in cases of endodontic pathology*

This review article aims to outline various pharmacologic treatment approaches in resolving pain

Keywords: *Dental, Pain, Endodontic, Drugs, Anxiety, Root Canal Treatment*

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I. Introduction

Phobia of pain and discomfort is one of the most commonly occurring cause of a patients' indecisiveness before scheduling a dental visit. This aspect may become a bit more exaggerated in case of endodontic diseases where often the first and sometimes the only symptoms a patient experiences is severe dental pain. As a result, in such cases, the extreme pretreatment pain intensity may sensitize the patient to anticipate even more discomfort while undergoing the actual treatment procedure. Such a situation puts the clinician in a fix since pain as a symptom has a psychologic aspect and a physiologic component.[1]

The treatment protocol for treating endodontic diseases includes a combination of both clinical procedures along with supplementation of medications to resolve pain and anxiety. While the key aspect of treatment planning for managing pulpal and periapical pathology includes intraoperative procedures such as pulpotomy/root canal therapy but they seldom provide immediate pain relief.

Majority of patients may still experience pain ranging from mild to moderate intensity post the completion of endodontic therapy.[2,3] Pharmacologic strategies in endodontics consists of administering drugs, commonly analgesics, ant anxiety medication and less commonly antibiotics during preoperative and post operative period. Pretreatment patient phobia warrants prescription of anti anxiety agents in some cases while intraoperative pain control is achieved by administering local anesthesia.[4]

The current paper explores the efficacy of pharmacologic therapeutic interventions in management of endodontic pain.

II. Diagnosis of Pain

Establishing the correct diagnosis is paramount in outlining a treatment plan. This involves differentiating between odontogenic and non odontogenic pain as well as between pulpal and periodontal origin of pain.

Chief Complaint

Chief complaint of patient with pulpal pathology is commonly acute orofacial pain. Detailed record of pain history should be obtained from the patient as follows:

1. Onset of pain
2. Location of pain
3. Nature and severity of pain
4. Referred pain

5. Aggravating and relieving factors
6. Effect of posture on pain

Medical and Dental History

Medical diseases that may simulate symptoms of dental pathology include sinusitis, migraine, musculoskeletal disorders, ear and nose infections. Clinician should enquire regarding any associated symptoms that may occur concurrently like nausea, nasal congestion, vision changes. Previous dental history is also significant in identifying the cause or origin of pulpal inflammation and also gives an idea regarding patient compliance.

Clinical Examination and Diagnostic Test

Soft tissue and mucosa are examined for presence of swelling or inflamed tissues. Periodontal health is evaluated by probing and percussion testing. Teeth are inspected to check for caries, faulty restorations, attrition or cracks.

Vitality Testing for Dental Pulp

Thermal and electrical testing is carried out to identify the presence or loss of pulp vitality as well as to determine if the pulpal inflammation is reversible or not. Cold tests have been considered to be more reliable most of the time. [5] If the pulpal inflammation is reversible then the pain usually subsides on removal of stimulus. However an irreversibly inflamed pulp will give a lingering response even after stimulus removal. Thermal tests are of little value in older patients since they have receded pulp cavity. Here electric pulp tests may be performed to assess the pulp status. Recent aids to check for pulp vitality include laser Doppler flowmetry and pulse oximeter.

III. Pharmacologic Interventions for Relieving Endodontic Pain

Pretreatment Medication and Intraoperative Management of Pain

As stated previously, definitive treatment of pulpal pathology involves root canal therapy which decreases the pressure inside pulp chamber and results in removal of the infected and necrotic tissues from the root canal system. Since the pain of pulpal diseases can be of most severe nature, it is of utmost importance to achieve profound local anesthesia. Apart from the nerve block, there is often a need to administer supplemental injections especially in cases of acute irreversible pulpitis.

2% lidocaine with 1:100000 epinephrine is a commonly used local anesthetic agent. If a prolonged duration of pain control is required, then long acting anesthetics like bupivacaine can be used. [6,7] Ropivacaine is another long acting anesthetic that has lower risk of central nervous system and cardiovascular effects.[8] Long acting anesthetic agents also appear to a provide considerable post treatment pain relief. Incidence of post treatment pain reduces for upto period of 48 hours.[9]

Management of Postoperative Pain

Various drugs that have been used for treating post operative endodontic pain include non narcotic analgesics consisting of non steroidal anti-inflammatory analgesics, opioids and steroidal drugs.

(a) Non steroidal anti-inflammatory drugs (NSAIDS)

These drugs are commonly prescribed for management of both pre and post treatment endodontic pain. They act by blocking the activity of cyclooxygenase (COX 1 and 2) enzyme. In human dental pullps with irreversible pulpitis, a higher level of expression of COX 2 was demonstrated by Nakinishi et al [10] In cases of irreversible pulpitis NSAIDS can be administered preoperatively since they reduce the level of PGE2 which is responsible for sensitization of pulpal nociceptors. This lowers the resistance of nociceptors to local anesthetics.[11] Drugs like Ibuprofen and ketorolac as monotherapy have proved effective in various studies for relieving post treatment endodontic pain.[12,13,14] As an alternative to a single drug, a combination of non selective NSAID with acetaminophen or an opioid could also be used for pain management. Acetaminophen has less adverse effects compared to other NSAIDS and it appears to provide an additive action in combination with various NSAIDS such as ibuprofen, ketoprofen, diclofenac in pain relief.[15]

(b) Steroids

Glucocorticoids were utilised in endodontics due to their anti-inflammatory properties. They have proved effective in resolving post operative pain and inflammation when used as intracanal medicament.[16] Various steroidal agents that have been studied include ledermix, dexamethasone, prednisolone and triamcinolone acetonide. Nobuhara reported a significant Periapical anti-inflammatory effect of local infiltration of dexamethasone in vital and partially necrosed teeth with over instrumentation.[17] Intraosseous injection of methylprednisolone have been shown to achieve significant pain reduction in teeth with irreversible pulpitis where no endodontic treatment was performed.[18]

Opioid Analgesics

Opioids have been advised for endodontic pain management in situations where additional pain control is required after administering NSAIDS. They reduce pain by acting on mu receptors that block pain transmission from trigeminal nucleus to higher brain centers.[19,20] Commonly prescribed opioid analgesic combinations include acetaminophen (300 mg) and codeine (30 mg) or acetaminophen (500 mg) and hydrocodone or oxycodone (5 mg). However the use of opioids is associated with side effects like vomiting, dizziness, constipation. Tolerance and dependence may occur with chronic use. A synthetic opioid drug with lower abuse potential and decreased incidence of adverse effects is tramadol. It has shown efficacy in reduction of moderate to severe endodontic pain.[21]

IV. Conclusion

Pulpal and periapical diseases may result in symptoms of pain ranging from mild to severe nature. Extensive pain coupled with patient's fear and anxiety makes it all the more difficult for clinician to provide effective dental treatment. Therefore the most important aspect of managing endodontic patient is profound pain control during and after the treatment. Although the mainstay of treating endodontic infection is to carry out the canal debridement procedures, still pharmacologic management of pain is often required as an adjunct in most of the cases. The preoperative pain reduction is achieved by profound anesthesia. Postoperative pain management relies mostly on the use of analgesics including NSAIDS like ibuprofen and acetaminophen. Apart from non narcotic drugs, steroids and opioids have also been recommended in literature as effective alternatives.

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