Management of Post Treatment Endodontic Pain

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Abstract: Pain, swelling, esthetics and loss of function are the major etiological factors for an individual to seek dental care. Patients typically associate dental care with pain and this pain refrain most patients from timely seeking dental therapy. Endodontic post-treatment pain continues to be a significant problem that has a negative influence on patients mind towards dental treatment. Management of post treatment dental pain is essential. Analgesics provide an effective aid in management of post treatment pain and are required in a variable percentage of endodontic cases. The purpose of this review article is to assess different pharmacologic approaches in the control of post treatment endodontic pain.

Key words: Endodontic, Pain, NSAIDS, Cortecosteroids, Analgesics, Opioids.

INTRODUCTION

Odontalgia is the most common form of orofacial pain. Pain has both physiological and psychological components. For many patients, avoidance of dental therapy because of fear of dental pain are synonymous. Endodontic post-treatment pain continues to be a big dilemma facing the dental clinician. For those patients presenting with preoperative pain, it has been reported that up to 80% of this population will continue to report pain after endodontic treatment, with pain levels ranging from mild to severe. The pain relief after endodontic treatment is effective, but is rarely immediate and complete. Therefore, it is evident that post-treatment analgesic intervention is required in a variable percentage of endodontic cases.

ROLE OF NON-STERoidal ANTI-INFLAMMATory DRUGS (NSAIDS)

NSAIDs have been the traditional treatment for moderate pain. They act primarily through the inhibition of cyclooxygenase (COX) enzymes 1 and 2. COX-1 is expressed throughout the body and has a role in protection of stomach mucosa, kidney function and platelet action. COX-2 is induced by various endogenous compounds such as cytokines, mitogens and endotoxins in inflammatory cells and is responsible for the elevated production of prostaglandins during inflammation. NSAIDs have a relatively high affinity to plasma proteins and are preferentially distributed to inflamed tissue by local vasodilatation and plasma extravasation. Numerous NSAIDs are available for the management of pain and inflammation.

Huynh reported that analgesics most commonly prescribed in dentistry for acute pain relief include the non-steroidal anti-inflammatory drugs, acetaminophen and various opioid-containing analgesic combinations. Nevertheless, numerous clinical studies have confirmed that moderate to severe pain of dental origin is best managed through the use of ibuprofen or other NSAIDs and its maximum analgesic effect is at least equal to that of standard doses of acetaminophen-opioid combinations. It is important to understand that NSAIDs generally require a higher dose to achieve maximum anti-inflammatory action than that to achieve analgesic action.

Torabinejad et al and Rogers in different studies evaluated the effectiveness of various medications on post-operative pain and found that ibuprofen and ketorolac were commonly used NSAIDs that significantly reduced pain after endodontic surgery. Penniston and Hargreaves used a periapical injection of ketorolac to relieve odontalgia.

ROLE OF COX-2 NSAIDs

Although NSAIDs are remarkably yet their use is limited due to several adverse effects including gastrointestinal bleeding and ulceration, impaired renal function, and inhibition of platelet aggregation. Second cyclooxygenases (COX-2) had lesser side effects than traditional NSAIDs as the inhibition of COX-2 is more directly implicated in ameliorating inflammation while the inhibition of COX-1 is related to adverse effects in the gastrointestinal tract. This stimulated the development of selective COX-2 inhibitors that are better tolerated than nonselective NSAIDs but comparable in analgesic efficacy.

Celecoxib was the first selective COX-2 inhibitor to be approved by the FDA. Hubbard et al used the oral surgery model and demonstrated that celecoxib was superior to placebo, comparable to 650 mg of aspirin, but generally less effective than a standard dose of naproxen. Chen et al reported that the analgesic efficacy and tolerability of single-dose COX-2 inhibitors were more effective than opioid-containing analgesics and similar to non-selective NSAIDs in post-operative pain management.

ROLE OF CORTECOSTEROIDS

Corticosteroids contain 21 carbon atoms in a four membered hydrocarbon ring system. They comprise glucocorticoids and mineral corticoids. Glucocorticoids have been used in endodontics for their potent anti-inflammatory effects. Glucocorticoids have been used as an intracanal medication either alone or in combination with antibiotics/antistaminines, and systemically as a means to decrease pain and inflammation in endodontic patients. Blitzer stated that hydrocortisone as an intracanal medication resulted in reduction
and elimination of inflammatory reactions in periapical tissues. Ehrmann reported that ledermix stopped the pain associated with periapicritis.

After endodontic instrumentation and/or obturation, 1 ml of IM injection of dexamethasone significantly reduced pain incidence and severity at four hours post-treatment. Krasner in a double-blind study evaluated the effect of oral dexamethasone (0.75 mg/tablet) on post-treatment endodontic pain. Their results revealed that patients receiving oral dexamethasone had significantly less pain at eight and 24 hours when compared to those receiving placebo.

ROLE OF ANESTHETIC AGENTS

Bupivacaine is available as a 0.5% solution with 1:200,000 epinephrine. For postoperative pain control following a short procedure, bupivacaine may be administered at the start of the procedure. For postoperative pain control in a lengthy procedure, it might be reasonable to administer bupivacaine at the conclusion of the procedure, immediately before the patient's discharge from the office.

ROLE OF OPIOIDS

Opioids are potent analgesics that are often used in dentistry in combination with acetaminophen, aspirin or ibuprofen. This analgesic blocks pain perception in the cerebral cortex by binding to specific receptor molecules (opiate receptors) within neuronal membranes of synapses. These bindings result in a decreased synaptic chemical transmission throughout the central nervous system, thereby inhibiting the flow of pain sensation into the higher centers.

Codeine is an opioid analgesic that is considered the prototype opioid for orally available combination drugs. Most studies have found that a 60 mg dose of codeine produces significantly more analgesia than placebo, although it often produces less analgesia than either aspirin 650 mg or acetaminophen 600 mg. Tramadol is a synthetic, centrally acting analgesic that is thought to relieve pain through synergistic monoaminergic and μ-opioid mechanisms of action. Tramadol therapy has side effects like vomiting, nausea, dizziness and somnolence.

CONCLUSION

Endodontic post treatment pain continues to be a significant problem facing the dental profession. Therefore, posttreatment analgesic intervention is required in a variable percentage of endodontic cases. NSAIDs are effective for inflammatory pain, but have side effects like gastrointestinal, cardiac and renal toxicities. Systemic steroids are highly effective in those patients who present for treatment of moderate/severe pain with a clinical diagnosis of pulpal necrosis along with the associated periapical radiolucency. Opioids typically are effective for more severe pain, although they can have limited efficacy as monotherapy and hence should be used in combination. One should use analgesics with care and have adequate knowledge about their indication, contraindications and side effects.

REFERENCES