REVIEW ARTICLE

ROLE OF PHARMACOLOGICAL AGENTS IN ENDODONTIC THERAPY- A MINI REVIEW

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ABSTRACT:
Root canal treatment [RCT] is one of the most common dental procedures. Pain control and infection management is the foremost aim while performing the endodontic therapy. Therefore, use of analgesics and antibiotics becomes an integral part of dental procedures for treating dental infections and providing pain free procedures. Nowadays researches aim on finding medicaments with maximum efficacy and minimal side-effects.
Key Words: Analgesics, Antibiotics, Pain, Root Canal Therapy

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This article may be cited as: Aggarwal A, Luthra V. Role of Pharmacological agents in Endodontic Therapy- A Mini Review. J Adv Med Dent Scie Res 2015;3(4):96-98.

INTRODUCTION

Root canal treatment [RCT] is the dental procedure which aims to remove infected pulpal tissue followed by cleaning of root canal and filling it with a non – reactive inert material. Patients often evaluate and perceive RCT as one of the painful dental treatment.[1] Root canal pain is usually of pulpal or periodontal in origin which starts an inflammatory reaction and results from stimulation of various receptors including additional central mechanism.[2, 3]

Pain control and pain management usually focuses on reduction of chemical inflammatory mediators that mediates various pain receptors. This is usually managed by the administration of analgesics which exhibits anti-inflammatory and analgesic properties. Analgesics are divided into many domains with nonsteroidal anti-inflammatory drugs (NSAIDs) being the most commonly prescribed drugs for the management of endodontic pain.[1]

Recent literature shows theories which employ combined use of anti bacterial drugs (metronidazole, ciprofloxacin and minocycline) for disinfecting pulp and periapical tissues.[4]

Medicaments are used as an aid to improve the predictability and prognosis of endodontic treatment. They are used in endodontic therapy mainly in order to:

- Elimination of remaining bacteria in the pulpal region that have not been invaded and destroyed during root canal preparation procedures,
- Reduce pulpal and periapical pain and inflammation,
- Assure that no re-infection of the root canal system occurs even if the restorative barriers temporarily break downs.[5-7]

Scientific literature and proof is still lacking in the popular notion of entombment and perishing of periapical microbes following root canal treatment.[8, 9] Significance of anti-microbial treatment lies in the fact that mere microbial presence inside a root canal may not necessarily lead to the failure of treatment, but its absence will certainly favour healing.[10]

ANTIBIOTICS

These are available either singly or in combination of antibiotics, and may also sometimes incorporate some other compounds such as corticosteroids. Antibiotics can be used systemically or locally as an adjunct to endodontic treatment.[11] Grossman records the first reported case in the literature, to use antibiotics locally in the endodontic treatment which was known as PBSC which contained penicillin to target Gram-positive organisms, bacitracin for penicillin-resistant strains, streptomycin for Gram-negative organisms, and

caprylate sodium to target yeasts with all these compounds suspended in a silicone vehicle.[12] Ledermix™ paste and Septomixine Forte™ paste are the two most common antibiotic-containing commercial paste preparations which are currently available. Both of these commercial formulations also contain corticosteroids as anti-inflammatory agents.[11]

One of the common protocols used these days is the Antibiotic prophylaxis (AP) which involves use of antimicrobial agent before commencement of any infection, for the purpose of preventing a subsequent infection.[13, 14] Infective Endocarditis (IE) requires lots of serious attention because of its high morbidity and mortality rate. Therefore, it is necessary and advised that AP is required before dental procedures which are likely to induce bacteraemia. But data quotes low incidence of IE and also there is no evidence that AP is either effective or ineffective against IE in people undergoing or about to undergo various dental procedures.[15]

Literature quotes studies that show IE during dental Procedures includes various protocols, theories and methods generally utilized to support relation and association between various invasive dental procedures, bacteraemia and occurrence of subsequent infective endocarditis includes:

- Animal experimentation.
- Providing sure evidence that AP preoperatively is protective against infective endocarditis with the inference that the procedure was the cause of the disease in the unprotected.
- To have sure evidence that dental procedures actually produces bacteraemia.[16]

ANTIBIOTIC PROPHYLAXIS

Two mechanisms are mainly involved for providing AP before dental procedures which are likely to produce a bacteraemia because of IE. First one involves reduction in the number of organisms in the blood and the second one includes reduction in the adhesion of organisms to the nonbacterial thrombotic vegetation.[17]

Various different methods have been bought up for reducing bacteraemia, apart from conventional method of antibiotic prophylaxis of IE. This includes use of pre-operative 1% povidoneiodine for reducting bacteraemia from oral sources[18, 19]. In one of the double-blind trial including 60 patients involved in taking pre-extraction rinsing with 1% (v/v) chlorhexidine, 1% (v/v) povidone-iodine and a control of NaCl, showed a significant reduction in bacteraemia between both antimicrobials and the control was shown.[20]

PAIN CONTROL

Pain controlling or analgesic medications are broadly categorized in three categories. Narcotics being the most powerful one and have three types of receptors in the brain. Second category includes Aspirin and the NSAIDS which mainly act at the site of injury causing reduction in pain-invoking prostaglandins that are made within the damaged cell. Narcotics have side-effect of causing addiction, with characteristics unique from other types of addiction. This addiction includes both physical and psychological one. They form on the main line of treatment in patients reporting with history of drug allergies. The practitioners are left with no choice except for prescribing narcotics. Propoxyphene was originally introduced as a nonnarcotic; however, with time and researches, it is now known to be rather a weak narcotic. Inspite of its weak line of action, it is still effective in many patients may be beacus of its certain characteristic features including dizziness which makes the patient feel that it must be helping with the pain. Darvon® is available in single plain formulation or in combination with aspirin or with acetaminophen, called as Darvocet-N®. Oramorph® is the oral formulation of morphine. Oral drugs have usually rapid liver metabolism, therefore, mostly a larger dose is required than is typical of the parenteral dose. NSAIDs (Motrin/ Advil) usually do not cause interruption of platelet synthesis for nearly as long because their binding to cyclooxygenase is reversible. Shortly after the NSADIs are metabolized, bleeding profiles return to normal. Acetaminophen (Tylenol) gives patients relief but the mode of action and the site of action in brain is unknown.other formulation containing aspirin and acetaminophen includes Excedrin®, Goody's Headache Powder®. Patients with chronic liver disease, alcohol users or with liver abnormalities should use Acetaminophen is with great caution as it is metabolized by the liver. Recent study research data shows that acetaminophen is a better choice for the elevation of the threshold for sharp pain, such as with dental treatment, than other types of pain relievers.[21, 22]

CONCLUSION

Elimination of etiologic micro-orgnisms is the main aim of performing a successful root canal treatment. Pre-operative medications including both antibiotics and analgesics have a very significant impact on both pain management during and after the treatment procedure and in the treatment outcome in controlling and eliminating the microbial infections. Therefore, future

researches should aim on comparing the effectiveness of these analgesics and antibiotics so that much better medications with minimal side-effects could be recognized and used.

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Source of support: Nil

Conflict of interest: None declared