The Effect of Triple Antibiotic Paste as an Intracanal Medication with an Anti-Inflammatory Drug on Post-Operative Pain of Asymptomatic Uniradicular Necrotic Teeth

(A Double Blind Randomized Clinical Trial).

A Thesis

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This work is dedicated to:

My Beloved Parents and Wife

who have been my constant sources of inspiration.

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The elimination of intracanal microorganisms is essential for the long-term success of root canal treatment. This may be achieved by mechanical cleaning and shaping in conjunction with irrigation and antibacterial agents. However, endodontic therapy essentially is directed toward one specific set of aims: to cure or prevent periradicular periodontitis.

Microorganisms as *E. faecalis* are able to form a biofilm that helps it to resist destruction by enabling the bacteria to become a thousand times more resistant to phagocytosis, antibodies and antimicrobials than nonbiofilm producing organisms.

It is resistant to inter appointment medicaments including calcium hydroxide and may also reside in canals as single species without the support of other organisms. It was also reported that this microorganism has the ability under specific conditions to infect the whole length of the tubules within 2 days**.**

Our challenge as endodontists is to implement methods to eliminate this microorganism during and after root canal treatment.

Systemic antibiotics appear to be clinically effective as an adjunct in certain surgical and nonsurgical endodontic procedures. Their administration is not without the potential risk of adverse systemic effects, such as allergic reactions, toxicity and the development of resistant strains of microbes. Furthermore, the systemic administration of antibiotics relies on patient's compliance with the dosing regimens followed by absorption through the

gastro-intestinal tract and distribution via the circulatory system to bring the drug to the infected site. Hence, the infected area requires a normal blood supply which is no longer the case for teeth with necrotic pulps and for teeth without pulp tissue. Therefore, local application of antibiotics within the root canal system may be a more effective mode for delivering the drug**.**

A successful endodontic treatment is therefore dependent on the initial eradication of all the bacteria, i.e. those present in the root canal as well as those already penetrated in depth. The achievement of microbicidal doses becomes critical in the endodontic environment, because in such harsh conditions bacteria may aggregate to form a biofilm or enter a stationary phase, thus acquiring a resistant phenotype. Accordingly, in endodontic therapy the local use of antibiotics allows the use of the necessary very high concentrations. Moreover, some antibiotics like tetracyclines may represent the optimal choice to grant long-lasting antimicrobial effects, since they readily attach to dentine and are gradually released, retaining their antibacterial activity**.**

Because root canal infections are polymicrobial consisting of both aerobic and anaerobic bacterial species, single antibiotic may not be effective in canal disinfection. Therefore, combination of antibiotics, mainly consisting of ciprofloxacin, metronidazole, and minocycline, referred to as triple antibiotic (TA) paste has been suggested for root canal disinfection.

REVIEW OF LITERATURE

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I. Evidence Based Dentistry:

Evidence-based dentistry is defined by the American Dental Association as an approach to oral health care that requires the integration of systematic assessments of clinically relevant scientific evidence with the patient's treatment needs and preferences and the dentist's clinical experience [(1)].

The hierarchy of evidence is a core principal of evidence-based practice, as it determines the "best available evidence" to be used as a guide for decision making. Study design and quality are the key factors used for ranking on the evidence hierarchy pyramid. Systematic reviews have the highest level of strength followed by randomized clinical trials (RCTs) then cohort studies, case control studies, case series and case studies [(2)].

Randomized clinical trials is the strongest design of experimental studies related to therapeutic or preventive interventions. In a RCT, participants are randomly allocated to either one intervention (such as a drug treatment) or another (such as placebo treatment), both groups are followed up for a specified time period and analyzed in terms of specific outcomes defined at the outset of the study. As the groups are identical apart from the intervention due to randomization, any differences in outcome could be attributed to the intervention with a certain degree of certainty that the results are a valid estimate of the truth [(3)].