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**INTRACANAL DISINFECTION AND MEDICAMENTS
IN REGENERATIVE ENDODONTIC THERAPY**

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Immature necrotic permanent tooth presents a distinctive challenge. Various treatment modalities have been employed to create hard tissue barrier at the apex, which includes non-vital pulp therapy with calcium hydroxide, apexification with mineral trioxide aggregate, pulp revascularization and regeneration. Regenerative endodontics is a novel modality which involves physiological replacement of the damaged structures of tooth like dentin, root and cells of the pulp-dentin complex. Root canal irrigation and disinfection is One of the most significant stages of root canal therapy, removing infectious microorganisms and microbial components from root canals to preventing re-infection of canals. Various chemical and mechanical methods have been used to reach this purpose. Ethylene-diamine-tetra-acetic acid (EDTA), sodium hypochlorite (NaOCl) and chlorhexidine (CHX) are some of the best-known chemical components for root canal disinfection. In Recent years, the advent of nanomaterials and their ability in targeted drug delivery have led to significant progress in the disinfection of root canal and accessory canals. Nanoparticles showed higher antibacterial potency because they have higher polycationic/polyanionic nature and higher charge density so their interaction with the bacterial cell is higher.

The purpose of our work to review new approaches in intracanal disinfection and medicaments in regenerative endodontics of immature permanent teeth and evaluate the results.

A primary search was performed within articles of the last ten years using PubMed and Google Scholar search motors and a total of 50 articles were recognized. The search was conducted by using these keywords: "polymers", "nanoparticles", "polymeric nanoparticles", "root canal disinfection", and "regeneration". Then, the studies were classified in the following order: root canal irrigation and disinfection, obturating materials, root-repair materials, regenerative endodontics therapy.

An analysis of the literature over the past decade has shown that, the degree of disinfection determines the success of the treatment. 1.5% NaOCl concentration doesn't change in odontoblastic differentiation. Use of EDTA as the final Irrigant partially reversed the detrimental effects of NaOCl. 1.5% NaOCl is optimal for its dissolution and disinfecting capabilities followed by 17% EDTA as a final Irrigant to promote stem cell survival, attachment and differentiation. In regenerative endodontic treatment use of antibiotic-eluting fibers as drug delivery systems which is composed of nanofibers increase (9x) proliferation of stem cells compared with pure Triple Antibiotic Paste (TAP), well-controlled release of antibiotics during the procedure and minimal tooth discoloration. Using of TAP-eluting nanofibers when compared with TAP can improve the quality of treatment.

There have been significant changes in the clinical treatment of infected immature permanent teeth over the years. Although the new treatment approach can sometimes be challenging and the outcome of the revascularization procedure is still somewhat unpredictable, new modifications of regenerative endodontic therapy make it the method of choice for the treatment of infected permanent immature teeth.