ASDJ
AINSHAMS DENTAL JOURNAL

Print ISSN 1110-7642
Online ISSN 2735-5039

AIN SHAMS DENTAL JOURNAL
Official Publication of Ain Shams Dental School
March 2025 • Vol. 37

Antibacterial Efficacy of Chitosan Nanoparticles-Incorporated with Different Endodontic Irrigation Solutions: An In-Vitro Study

Abstract:

Aim: The Purpose of this investigation was to evaluate antimicrobial effectiveness of two concentrations of nanochitosan NC 0.2%, 0.5%) combined with sodium hypochlorite (NaOCl 5.25%) and chlorhexidine (CHX 2%).

Materials and methods: Seventy two ,without caries, single rooted mandibular first premolars with developed apices extracted for orthodontic purposes used. The roots of all teeth will be sectioned 14mm from the tip of the root. The entire root
surface was covered by two thin layers of nail polish, and the apical ends of the roots were sealed with flowable composite. All samples were prepared using the Protaper Ni-Ti rotary system.Ten microliters (10 µl) of Enterococcus faecalis suspension groups and control group. Highest antibacterial activity was when NC was mixed with NaOCl. NC 0.2%, Group II: NC 0.5%, Group III: NaOCl 5.25%, Group IV: CHX 2%, Group V: NC 0.2% + NaOCl 5.25%, Group VI: NC 0.5% + NaOCl 5.25%, Group VII: NC 0.2% + CHX 2%, Group VIII: NC 0.5% + CHX 2%, Group IX: Distilled Water(D.W.). After disinfecting the canal, intracanal bacterial samples were collected and counted in order to establish the number of colony-forming units (CFUs).

Results: According to the study, a statistically significant difference was observed in mean of CFUs of the experimental groups and control group. Highest antibacterial activity was when NC was mixed with NaOCl.

Conclusion: This research demonstrates that there is synergistic antimicrobial activity when NC irrigation solution (0.2%,0.5%) is mixed with NaOCl 5.25% and CHX 2%.