In vitro evaluation of the antimicrobial efficacy of 5% Doxycycline, 0.2% Chlorhexidine gluconate and 2.5% Sodium hypochlorite used alone or in combinations against Enterococcus faecalis

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ABSTRACT

The present in vitro study was undertaken to evaluate the antimicrobial efficacy of 5% doxycycline, 0.2% chlorhexidine gluconate and 2.5% sodium hypochlorite when used alone or in combinations against Enterococcus faecalis. Agar diffusion test was done to evaluate the antimicrobial efficacy of the various intracanal irrigants. Enterococcus faecalis (ATCC 29212) was used as a test organism. The inoculum of E. faecalis was streaked on the agar plates. Using a punch, wells each measuring 6mm in diameter and 4mm depth were made and 50 µl of the experimental irrigant was pipetted into each well. A total of 200 wells were made, 40 for each group and the plates were placed in a carbon dioxide incubator at 37º C for 48 hours. The zones of inhibition were measured using a mm scale and the results statistically analyzed using ANOVA test and Tukeys HSD. The zones of inhibition recorded were 19.90, 14.60, 24.75, 25.58, 26.86 mm for Group A (chlorhexidine gluconate), Group B (sodium hypochlorite), Group C (doxycycline), Group D (combination of doxycycline and sodium hypochlorite) and Group E (combination of doxycycline and chlorhexidine gluconate) respectively. Within the limitations of this experiment, the results of the present study concluded that a combination of 5% doxycycline and 0.2% chlorhexidine is the choice of irrigant against E. faecalis.

Keywords: Agar diffusion test, Antimicrobial property, Chlorhexidine, Doxycycline, Enterococcus faecalis, Sodium hypochlorite

Complete debridement of the contaminated system is paramount as well as a precondition for successful pulp space therapy. Microorganisms and their byproducts play a crucial role in contaminating the root canal system.1 One of the main causes for the failure of pulp space therapy is the persistence of microorganisms and their reinflection. Sundqvist et al.2 recovered numerous species of anaerobic bacteria from failed root canal cases, of which E. faecalis was found to be the most prevalent bacteria. Enterococci are less dependent on their virulent factors and their emergence as pathogens may be related to their resistance to several antimicrobial agents.3

Biomechanical preparation and chemical