

Original Article

Antimicrobial efficacy of newly prepared nano-tricalcium silicate-58s bioactive glass-based endodontic sealer

ABSTRACT:

Aim: Endodontic sealers with antimicrobial impact are considered relevant to prevent re-infection and ensure healing of damaged periapical tissue. Hence, this study aimed to assist the antimicrobial effect of newly developed nano-tricalcium silicate-58s bioactive glass (BG)-based endodontic sealer (C3S-BG-P), and compare its results with Nishika Canal Sealer BG and BioRoot™ root canal sealer (RCS).

Methods: The antimicrobial impact of endodontic sealers was evaluated by both agar diffusion test (ADT) and direct contact test (DCT) against *Enterococcus faecalis* and *Candida albicans*. In ADT, the diameter of inhibition zones was measured after 1, 2, and 3 days of incubation using Digimizer software program. In DCT, the sealers were allowed to set for 1, 7, and 14 days and then exposed to the microbial suspension for 24 h. The colony-forming unit was counted using ImageJ software program. The data were analyzed with ANOVA and Tukey's tests.

Results: In ADT, all the tested sealers showed antimicrobial effect after 3 days, with no significant difference after 1 day, but the impact of C3S-BG-P and Nishika significantly higher than that of BioRoot after 2 and 3 days. In DCT, C3S-BG-P and Nishika had an antimicrobial effect against both isolates even after 14 days of their setting, whereas BioRoot had an effect for 7 days of its setting and lost its impact after 14 days.

Conclusion: C3S-BG-P explored antimicrobial impact superior to that of BioRoot and nearly comparable to that of Nishika against *E. faecalis* and *C. albicans*, which last even after 14 days of its setting.