

POSTER PRESENTATION

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Synthesis and antimicrobial activity of β -lactams in dentistry for treatment of root canal infection

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Background

The treatment of root canal infection consists of eradicating microbes from the root canal and preventing re-infection by root filling. Though the existing intra canal medicaments fight against multidrug resistant microbes in root canal, still re-infections occurs. The objective of this study is to synthesize new β -lactam compounds and evaluate their antimicrobial activity to treat root canal infections.

Materials and methods

A series of β -lactam compounds were synthesized through 1, 3 dipolar cycloaddition reaction and their antimicrobial activity was evaluated against *E. faecalis*, *S. aureus*, *S. pneumoniae* and *C. albicans* that are commonly implicated in endodontic failures. The antibacterial activities were assessed *in vitro* by 1) Agar diffusion test (ADT) 2) MIC by microdilution method 3) Time kill assay 4) Efficacy in *ex vivo* dentine model 5) Haemolytic assay.

Results

In this study, 16 compounds were tested and 6 compounds showed activity against *E. faecalis*, *S. aureus*, *S. pneumoniae* and *C. albicans*. In the time kill assay, the CFUs of *E. faecalis* were reduced after treatment with the compounds at their MICs. All the 6 compounds showed good antibacterial activity in dentinal tubule model at depth of 200 μ m and 400 μ m and the compounds were found to be hemocompatible.

Conclusion

Overall, our experimental results revealed that β -lactam compounds exhibited promising antimicrobial activities

in dentinal tubule model which can be further explored for the development of potent drugs against microbes involved in endodontic failures.

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