

Comparison of Enterococcus faecalis biofilm degradation after diode laser exposure with Chlorophyll and Psoralens photosensitizer

by Setyabudi Geonharto

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ABSTRACT

Comparison of *Enterococcus faecalis* biofilm degradation after diode laser exposure with *Chlorophyll* and *Psoralens* photosensitizer

Veronica Regina Rosselle¹, Cendranata Wibawa Ongkowijoyo¹, Setyabudi², Sri Kunarti^{2*}, Nirawati Pribadi²

¹Resident of Conservative Dentistry Department, Faculty of Dental Medicine, Universitas Airlangga, Surabaya, Indonesia

²Lecturer of Conservative Dentistry Department, Faculty of Dental Medicine, Universitas Airlangga, Surabaya, Indonesia

*Corresponding to:

Sri Kunarti;

Department of Conservative Dentistry, Faculty of Dental Medicine Universitas Airlangga, Surabaya, Indonesia;

attybp@yahoo.com

Introduction: *Enterococcus faecalis* are dominant in root canal infection and can survive harsh conditions such as high pH, scarce nutrients, and heat. They form mature biofilm readily and can resist disinfection approaches. Photo-activated disinfection with photosensitizer and laser irradiation is a viable alternative to eliminate *E. faecalis* biofilm. This study aimed to investigate and compare *E. Faecalis* biofilm degradation using photo-activated disinfection with chlorophyll or psoralens photosensitizer and 405 nm diode laser irradiation.

Methods: This study used *E. Faecalis* biofilm grown in the laboratory. *Chlorophyll* or *psoralens* were applied as a photosensitizer, and then 405 nm diode laser was irradiated for 30 or 60 seconds. The effectiveness of biofilm degradation was measured with optical density using microplate reader.

Results: *Chlorophyll* with 30 seconds of laser irradiation results in 30.8% biofilm degradation, whereas *psoralens* with 60 seconds of laser irradiation result in 81.8% biofilm degradation. One-way ANOVA test results in significant difference in biofilm degradation effectiveness amongst all groups.

Conclusion: *Psoralens* with 60 seconds of 405nm diode laser irradiation yielded the most *Enterococcus faecalis* biofilm degradation compared to other groups.

Keywords: Photo-activated disinfection, photochemical reaction, photosensitizer, root canal biofilm

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PAGE 1
