P3 : Effect of blue light and hydrogen peroxide on *Porphyromonas gingivalis* in biofilm

Benyawan Uea-arancho1, Chutamas Rakkhansaeng2, Ubonwan Tapsuri1, Angkhana Sangpanya2, Aroon Teerakapong3

Abstract

The phototoxic effect of blue light was found to involve the induction of reactive oxygen species (ROS) production by the gram negative periodontal pathogens. This may result in significant damage to cell structure of bacteria without the application of exogenous photosensitizer molecules. Therefore, the purpose of this study was to compare between the antibacterial effect of blue light and a combination of blue light and hydrogen peroxide on *Porphyromonas gingivalis* in biofilm culture. This study was classified into 4 groups, the first group of biofilms were exposed to blue light at wavelength of 405 nm. The distance between the light source tip and the exposed each sample was set at 80 cm. in order to obtain a constant power dentistry of 50 mW/cm². The second group of biofilms were exposed to 1% H₂O₂ without light exposure and the third group of biofilms were exposed to blue light in the present of 1% H₂O₂. Control groups consisted of sample undergoing the same procedure without blue light and 1% H₂O₂. After light exposure the bacteria killing rates were calculated from colony forming unit (CFU) count at 1, 3, 6 hours suspecitively. The bacterial growth was decreasing continuously. It tend to decrease from 1 hour after light exposure to 6 hours and dropped below the control group. The results showed that the bacteriostatic process need to take time for reaction. The hydrogen peroxide group and the combination of blue light and hydrogen peroxide on killing bacteria should be discussed. We found that blue light at wavelength of 405 nm could be used for bacterial eradication without the addition of exogenous photosensitizer.

Keywords: Blue light; Hyrogen peroxide; *Porphyromonas gingivalis*; Reaction oxygen species

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1Fifth year dental student, Faculty of Dentistry, Khon Kaen University, Khon Kaen, Thailand
2Lecturer, Department of Periodontology, Faculty of Dentistry, Khon Kaen University, Khon Kaen, Thailand
3Associate Professor, Department of Periodontology, Faculty of Dentistry, Khon Kaen University, Khon Kaen, Thailand

Correspondence author

Angkhana Sangpanya, D.D.S.
Department of Periodontology, Faculty of Dentistry, Khon Kaen University, Khon Kaen, 40002, Thailand.
Tel: 043-202405
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