Antimicrobial photodynamic therapy with erythrosine photosensitizer against immune response in chronic periodontitis model

Title	Antimicrobial photodynamic therapy with erythrosine photosensitizer against immune response in chronic periodontitis model
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Abstract	Chronic periodontitis is a progressive inflammatory disease of the supporting tissues of the teeth caused by dental plaque bacteria with a clinical sign of periodontal pockets. A Gram-negative bacterium that can trigger this inflammatory disease is Porphyromonas gingivalis. Antimicrobial photodynamic therapy with blue LED light irradiation and photosensitizer erythrosine can reduce the survival rate of P. gingivalis. This study aimed to determine the effects of antimicrobial photodynamic therapy (APDT) exposure with blue LED light irradiation and PS erythrosine on the number of macrophages, lymphocytes, and gingival fibroblasts in gingival tissue of Sprague Dawley rats as chronic periodontitis models. This study used a posttest-only control group design to examine 27 Sprague Dawley rats which were divided into P group (healthy rats), N group (untreated chronic periodontitis rats), and PDT groups (chronic periodontitis model given 1 mg/ml PS erythrosine and irradiated with blue LED light for 60 seconds). Cell observation of histologic preparations of rat gingival tissue with hematoxylin-eosin (H&E) staining was carried out on the 1st, 3rd, and 5th days. Histological preparations of gingival tissue with H&E staining was carried out on the 1st, 3rd, and 5th days. Statistical analysis used a one-way ANOVA and the Kruskal-Wallis test, continued with LSD and the Mann-Whitney post-hoc tests. Results showed significant difference in the mean of macrophages in the PDT group compared to the untreated chronic periodontitis group on the 1st, 3rd, and 5th days ($p < 0.05$). The mean lymphocyte in the PDT group was significantly different from the untreated chronic periodontitis group on the 1st, 3rd, and 5th days ($p < 0.05$), and significantly lower than that in the healthy group ($p < 0.05$) but only on the 3rd and 5th days. The mean fibroblast in the PDT group was significantly different compared to the untreated chronic periodontitis group on the 1st, 3rd, and 5th days ($p < 0.05$). In conclusion, there were significant differences in the number of macrophages, lymphocytes, and fibroblasts in a chronic periodontitis rat model after treatment with APDT exposure with blue LED and erythrosine photosensitizer.
Publisher Name	Faculty of Dentistry, Universitas Gadjah Mada
Publish Date	2023-08-01
Publish Year	2023
Doi	DOI: 10.22146/majkedgiind.77084
Citation	
Source	Majalah Kedokteran Gigi Indonesia
Source Issue	Vol 9, No 2 (2023): August
Source Page	171-180
Url	https://journal.ugm.ac.id/mkgi/article/view/77084/37257
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