



Dr. Deshu Zhuang

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Dr. Zhuang graduated from Harbin Medical University in China, and earned her PhD in periodontics from the same institution in 2016. She then moved to the University of British Columbia for a postdoc at the faculty of dentistry, supervised by Dr. Hannu Larjava. Dr. Zhuang was then went back to Harbin Medical University as an Associate Professor performing research work and clinical teaching. She has an active research interest in the sonodynamic therapy on periodontal disease and periodontal pathogen.

Sonodynamic effect of hematoporphyrin monomethyl ether on ligature-induced periodontitis in rats

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Objectives: This study aims to evaluate the efficacy of hematoporphyrin monomethyl ether (HMME)-mediated sonodynamic therapy (SDT) on experimental periodontal disease in rats.

Methods: Periodontal disease was induced by submerging ligatures at the first maxillary molar subgingival region in forty-eight male SD rats. After 30 days, the ligatures were removed. The rats were randomly allocated into four groups; the experimental SDT group was treated through hypodermic injection of 40 $\mu\text{g}/\text{mL}$ HMME and 3 W/cm^2 low-intensity ultrasound irradiation (1 MHz, 600 s). Those in control groups were received to 40 $\mu\text{g}/\text{mL}$ HMME alone (control 1 group) or to 3 W/cm^2 ultrasound irradiation alone (control 2 group) or subjected neither HMME nor ultrasound (control 3 group). After 10 days treatment, all rats were euthanized, the maxilla was obtained for histological examination and the alveolar bone level was evaluated by histometric analysis.

Results: The control groups showed more bone loss ($P < 0.05$) after 10 days treatment than the SDT group. There is no significant difference among the control groups ($P > 0.05$).

Conclusions: HMME mediated-SDT was an effective therapy of experimental periodontal tissue in rats.

Keywords: periodontitis; sonodynamic therapy; alveolar bone loss; animal model; ultrasound.