CED/NOF-IADR
2024 Oral Health
Research Congress
12 — 14 Sept 2024
Geneva, Switzerland

0240

Effects of ResolvinE1 and Maresin1 on PDL Fibroblasts With LPS

J. Kuramochi[1], K. Yamamoto[2], Y. Akashi[2], K. Nakajima[2], K. Kokubun[2], H. Iwasawa[1], M. Bamba[1], Y. Wada[1], M. Furusawa[1], K. Matsuzaka[2]

[1]Depertment of Endodontics, Tokyo Dental College, Tokyo, Japan, [2]Depertment of Pathology, Tokyo Dental College, Tokyo, Japan

Objectives The purpose of this study was to explore the effects of ResolvinE1 (RvE1) and Maresin1 (MaR1) on inflammatory response and bone remodeling ability of PDL fibroblasts under inflammation existence.

Methods Methods

In vitro studies, human periodontal ligament fibroblasts (HPDLF) were incubated with mineralization medium. For LPS group, HPDLF were incubated with 1000ng/ml LPS. For RvE1 group, HPDLF were incubated with 1000ng/ml LPS and 0.1nM RvE1. For MaR1 group, HPDLF were incubated with 1000ng/ml LPS and 0.1nM MaR1. For control group, HPDLF were incubated with only mineralization medium. Effects of RvE1 and MaR1 on HPDLF (n = 5/group) were evaluated by ALP activity, alizarin red S staining, and qRT-PCR. qRT-PCR was performed targeting mRNA of *IL-1β*, *IL-6*, *RANKL*, *OPG*, *RUNX2*, and *PLAP-1* gene as markers. *In vivo* studies, the mesial pulp of the mandibular first molars of Wistar rats was removed and the cavity was opened for 6 weeks to induce periapical periodontitis. Then the root canal was treated with material with 50nM RvE1 or 50nM MaR1 or sodium chloride solution, and the cavity was sealed with GIC. At 7 days after treatment, the mandible of each rat was extracted and processed for paraffin-embedded sectioning, then the samples were evaluated by H-E staining and immunohistochemical staining with IL-1β and IL-6 antibodies. The data were analyzed by one-way ANOVA analysis with post-hoc Tukey's multiple comparison test ($p < 0.05$).

Results *In vitro* studies, ALP activity, and the expression of bone-related genes of RvE1 and MaR1 groups were significantly higher than LPS group, and the expression of inflammation-related genes of RvE1 and MaR1 groups were significantly lower than LPS group. *In vivo* studies, IL-1β and IL-6 positive areas in immunohistochemical staining were reduced in both experimental groups.

Conclusions These results suggested that RvE1 and MaR1 reduce inflammatory response and promote bone remodeling ability of PDLF.