

## ABSTRACT

**Background.** The main etiology of endodontic treatment failure is caused by bacteria that stay in the root canal. *Enterococcus faecalis* is a bacteria that is found as an etiology of endodontic treatment failure. Cell wall of this bacteria is containing Lipoteichoic acid (LTA). LTA can penetrate into the periradicular tissue, act as endotoxin in host and cause periradicular inflammation. It occurs due to the capability of  $\text{NF-}\kappa\text{B}$  to release the cytokine of inflammation like IL-1, IL-6 and  $\text{TNF-}\alpha$ . *TNF-}\alpha* will stimulate the formation of IL-8 which is a chemotactic neutrophil factor, stimulating matrix metalloproteinase activity which is a proteolytic enzyme in neutrophils, resulting in collagen degradation in the extracellular matrix and basement membrane components. The result is degradation of the extracellular matrix of the periapical tissues of the teeth. Tissue remodeling does not occur, resulting in periapical tissue damage.

**Purpose.** The aim of this study is to know about the expression of  $\text{NF-}\kappa\text{B}$  and IL-8 during the periapical tissue damage due to induction of *Enterococcus faecalis*.

**Method.** This study used laboratory experimental with the post test only control group design. A total of 54 male rats were randomly divided into 2 main groups (27 teeth), which each main group had 3 subgroups. Group A (control) : every tooth was induced only by sterile BHIb. Group A had 3 subgroups (A Control day 3, 10, and 21), group B : every tooth was induced by 10  $\mu\text{l}$  BHI-b *E.faecalis* ATCC212(10<sup>6</sup> CFU), it was contained 3 sub groups (B day 3,10, and 21). The animals were sacrificed based on their days scheduled group and prepared for histological examination of periapical tissue, then we did the immunohistochemistry followed by calculation on the light microscope.

**Result.** The analysis revealed that the expression of  $\text{NF-}\kappa\text{B}$  and IL-8 increased significantly in group B when *Enterococcus faecalis* was induced.

**Conclusion.** From this study we know that the expression of  $\text{NF-}\kappa\text{B}$  and IL-8 are increasing during the periapical tissue damage that induced by *Enterococcus faecalis*.

**Keywords :**  $\text{NF-}\kappa\text{B}$ , IL-8, *Enterococcus faecalis*, periapical tissue damage