Abstract

Radical superoxide is a kind of reactive oxygen species (ROS) which causes oxidative damage by attacking biomolecules such as protein, lipid, DNA, etc. Over production of radical superoxide becomes a centre of the generation of other radical species and oxidants, and responsible for occurring many pathological processes. The main source of radical superoxide is to activate neutrophil. Therefore, it was speculated that induction of neutrophil by periodontitis bacteria Porphyromonas gingival is potential to induce superoxide production, only a few study, however concerned with this topic. This study aimed to know the pathogenicity of P. gingivalis by demonstrating the potency of P. gingivalis metabolites to induce production of radical superoxide by neutrophil. This study was conducted experimentally in vitro using posttest only design. Superoxide radical production was demonstrated by means of Nitrobluetetrazolium (NBT) slide assay and spectrophotometric. The results showed that P. gingivalis metabolites induced neutrophil to produce a large amount of radical superoxide both intra and extra cellular. Its radical superoxide production affected degranulation, apoptosis, and lysis of neutrophil. In conclusion, neutrophil responses against P. gingivalis generated prooxidative and toxic condition. This mechanism may explain the pathogenicity of P. gingivalis on many pathological processes.

Key words: Porphyromonas gingival, neutrophil, superoxide, reactive oxygen species