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THE ABILITY OF IMMUNOGLOBULIN Y FROM *PORPHYROMONAS GINGIVALIS* TO PREVENT ADHESION OF *FUSOBACTERIUM NUCLEATUM* AND *AGGREGATIBACTER ACTINOMYCETEMCOMITANS*

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ABSTRACT : *Aggregatibacter actinomycetemcomitans*, *Fusobacterium nucleatum* and *Porphyromonas gingivalis* are the periodontitis bacterium. IgY is a type of immunoglobulin that found in poultry, such as: chicken and birds. IgY can be used as an alternative prevention of plaque accumulation, which can cause chronic periodontitis. IgY is attractive for oral immunotherapy due to its several properties. The aim of this study was to prove IgY in egg yolk ability that can prevent the adhesion of *Fusobacterium nucleatum* and *Aggregatibacter actinomycetemcomitans* bacteria on enterocyte cell. The sample was divided into 8 groups, each group containing 10 ml of *Porphyromonas gingivalis* IgY and 50 enterocyte cells. The control group contained 50 ml of *Porphyromonas gingivalis* IgY and 50 ml of enterocyte cells. The first group to the seventh group was performed serial dilution with the first group containing 90 ml PBS and 10 ml *Porphyromonas gingivalis* IgY, the second group to the seventh group containing 50 PBS before adding 50 ml of enterocyte cells and 50 ml of bacterial suspension per group. The inherent bacterial count was calculated using a light microscope and the adherence index value was calculated. This study shows that *Porphyromonas gingivalis* IgY can significantly reduce the adherence index value of *Aggregatibacter actinomycetemcomitans* and can reduce the adherence index value of *Fusobacterium nucleatum* but not significantly. *Porphyromonas gingivalis* IgY can inhibit. *Aggregatibacter actinomycetemcomitans* adherence, but cannot inhibit *Fusobacterium nucleatum* adherence.

Key words : IgY, egg yolk, medicine, *Fusobacterium nucleatum*, *Aggregatibacter actinomycetemcomitans*.

INTRODUCTION

Periodontal disease or periodontitis is a bacterial infectious disease characterized by continuous inflammation, connective tissue damage and alveolar bone destruction (Vargas *et al*, 2015). Severe periodontitis characterized by tooth loss. This insident can be found in about 5-20% of adults in the world. Periodontal disease is divided into 3 types, aggressive periodontitis, chronic periodontitis and periodontitis manifestation of systemic disease (Aljehani, 2014). The bacterium that causes chronic periodontitis is the *Fusobacterium nucleatum* (*F. nucleatum*), while the bacterium that causes aggressive periodontitis is *Aggregatibacter actinomycetemcomitans* (*A. actinomycetemcomitans*) (Wilson *et al*, 2002; Raja *et al*, 2014). Both of these bacteria are a rod-shaped anaerobic gram negative bacterium. The habitat of *F. nucleatum* and *A. actinomycetemcomitans* was subgingival (Avila-campos *et al*, 2006; Gholizadeh *et al*, 2017; Popova *et al*, 2013). Virulence factors of *A. actinomycetemcomitans* bacteria were divided into three groups, virulence factors that modulate colonization and inflammation such as fimbriae, extracellular amorphous materials such as invasion and bacteriocin. Virulence factors that induce periodontal tissue damage such as lipopolysaccharide (LPS), inhibitors of chemotactic neutrophil activity, Cytolethal Distensing Toxin (CDT) and Fc binding protein. Virulence factors that inhibit periodontal tissue repair such as cytotoxins, Heat Shock Proteins (HSPs), collagenase (Malik *et al*, 2015). Virulence factors from *F. nucleatum* are adesine, outer membrane protein (OMP), lipopolysaccharide (LPS) and others (Avila-campos *et al*, 2006; Jung *et al*, 2017).

Attractive activity between the bacteria surface and the host cell surface is called bacterial adherence activity. There are three stages of bacterial surface adherence, namely transport, initial adherence (usually called bioattachment) and colonization (Sandle, 2013). To kill bacteria, we can use antibiotics, but the use of antibiotics also has a negative effect, namely the occurrence of resistance or increased bacteria ability to stay alive in the presence of antibiotics (Nami *et al*, 2015).