OUTER MEMBRANE PROTEIN OF PORPHYROMONAS GINGIVALIS AS BASIC OF DIAGNOSTIC TOOL IN AGGRESSIVE PERIODONTITIS

(PROTEIN MEMBRAN BAGIAN LUAR PORPHYROMONAS GINGIVALIS SEBAGAI ALAT DIAGNOSTIK PERIODONTITIS AGRESIF)

Desi Sandra Sari*, Candra Bumi**, Yuliana Mahdiyah DA*

* Departement of Periodontic
Faculty of Dentistry, University of Jember
** Faculty of Public Health, University of Jember
Jl. Kalimantan 37 Jember,
E-mail: desisandrasari@yahoo.com

Abstract

Porphyromonas gingivalis is a gram-negative anaerobic bacteria and has been shown previously to be one of the major pathogens in aggressive periodontitis. Outer membrane protein is the major virulence factor of P. gingivalis and plays role in the host immune response impair againsts P. gingivalis, which in turns, causing tissue destruction and bone resorption. This study was aimed to investigate the isolation and characteristic outer membrane protein of P. gingivalis. Protein of OMP P. gingivalis ATCC 33277 was isolated using sodium dodecyl sulphate polyacrylamide gel electrophoresis (SDS-PAGE) and than continued by hemagglutination test. The result showed that protein profil in SDS-PAGE of OMP protein was 40 kDa molecular weight dan hemagglutination test was positive in titer of hemagglutination 1/8. In conclusion, outer membrane protein molecular mass of 40kDa produced by P. gingivalis is a key virulence factor involved in the co-aggregation activity of P. gingivalis.

Key words: polyclonal antibody, Porphyromonas gingivalis, outer membrane protein

INTRODUCTION

Periodontitis is a chronic immunoinflammatory disease of the periodontium that results a progressive loss of gingival tissue, the periodontal ligament, and adjacent supporting alveolar bone. Chronic inflammation of the periodontium is initiated by complex subgingival biofilms containing several likely periodontal pathogens. The biofilm generally contains a portion of the gram negative anaerobic commensal microbiota as well as opportunistic pathogens of the oral cavity, including Porphyromonas gingivalis.

Black-pigmented anaerobe is a pathogen bacteria group in oral cavity and related with gingivitis, periodontitis, endodontic infection and odontogenic abscess. P. gingivalis and P. intermedia are one of the black-pigmented anaerobe bacteria. They are pathogen bacteria in early and advanced periodontal disease.

Outer membrane protein (OMP) bacteria of P. gingivalis caused the increasing of humoral immune response, so it can stimulate inflammatory cytokine expression, such as TNF-α, IL-1β, and IL-6 in monocyte and fibroblast of gingiva. It also induced bone resorption activity. Imai et al. research showed outer membrane protein found in negative gram bacteria is RagA, RagB and OMPA-like protein. RagB has the strongest virulent ability in periapical lesion subject. Whole cell of P. gingivalis bacteria, cell extract or OMP immunization can reduce periodontal tissue destruction that caused by P. gingivalis bacteria. Rat’s study showed that 40 kDa OMP antibody is potential to kill P. gingivalis bacteria.

The aim of this study was to investigate the isolation and characteristic outer membrane protein of P. gingivalis bacteria as the making dot enzyme immunoassay (EIA) material to examine aggressive periodontitis.

MATERIALS AND METHODS

This study was done at the Microbiology Laboratory of Dental Faculty, Jember University and...