

Induksi *Streptococcus mutans* terhadap Aktivitas Proteinase Netrofil pada Degradasi Kolagen Tipe IV (*Induction of Streptococcus mutans on Neutrophil Proteinase Activity in Degradation of Type IV Collagen*)

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Abstract

Background. Endothelial basal membrane of vasculature is composed mainly by type IV collagen. This vascular collagen degradation is the most powerful stimulus for platelet aggregation and thrombosis. This phenomenon is the basic mechanism of the pathogenesis of atherothrombotic diseases. *Streptococcus mutans*, the main bacterium of dental caries can invade easily into blood circulation, and therefore they have chance to involve in the pathogenesis of vascular destruction and thrombosis. It was assumed that *S. mutans* caused vascular destruction due to its potency to induce neutrophil proteinase activity to degrade type IV collagen. **Objective.** This study purposed to proof *in vitro* that *S. mutans* could induce and activate neutrophil proteinases leading to degradation tipe IV collagen. **Methods.** Collagen degradation was analysed by means of Sodium Dodecyl Sulphate Polyacrylamid Gel Electrophoresis (SDS-PAGE) and Soluble Biotinylated Assay (SBA). **Results.** Results showed that *S. mutans* induced production and activation of neutrophil proteinases leading to type IV collagen degradation into six fragments with the molecular weight were 129; 95; 50; 32; 28; 14 kDa. **Conclusion.** *S. mutans* induced neutrophil proteinase activity leading to degradation of type IV collagen. This study might explain one of mechanisms role of *S. mutans* in initiation of atherothrombotic diseases.

Key words: *Streptococcus mutans*; Type IV collagen; Neutrophil

Abstrak

Latar belakang. Kolagen tipe IV merupakan kolagen vaskular penyusun utama basal membran endotelial. Kerusakan kolagen vaskular akan menginduksi agregasi platelet dan pembentukan trombus vaskular, yang dapat memicu terjadinya penyakit aterotrombotik. Bakteri karies gigi *Streptococcus mutans* mudah berinvasi ke sirkulasi darah dan menginduksi respons inflamasi vaskular yang berpotensi menyebabkan kerusakan kolagen vaskular. Invasi *S. mutans* diduga menyebabkan rekrutmen dan aktivasi netrofil untuk memproduksi proteinase yang menyebabkan kerusakan kolagen vaskular. **Tujuan.** Penelitian ini bertujuan membuktikan secara *in vitro* bahwa *S. mutans* menginduksi produksi dan aktivasi proteinase netrofil sehingga menyebabkan degradasi kolagen tipe IV. **Metode.** Degradasi kolagen dianalisa dengan metode *Sodium Dodecyl Sulphate Polyacrilamide Gel Electrophoresis* (SDS-PAGE) dan *Soluble Biotinylated Assay* (SBA). **Hasil.** *S. mutans* mampu menginduksi dan mengaktifkan proteinase netrofil sehingga menyebabkan degradasi kolagen tipe IV menghasilkan enam jenis fragmen dengan berat molekul 129; 95; 50; 32; 28; 14 kDa. **Kesimpulan.** *S. mutans* menginduksi aktivitas proteinase netrofil dan menyebabkan degradasi kolagen tipe IV. Penelitian ini menjelaskan salah satu mekanisme peran *S. mutans* pada inisiasi penyakit aterotrombotik.

Kata Kunci: *Streptococcus mutans*; Kolagen tipe IV; Netrofil