

# Analisis Interaksi Sel Bone Marrow-Derived Macrophages dengan Bakteri *Aggregatibacter actinomycetemcomitans* = Interaction Analysis of Bone Marrow-Derived Macrophages Cells and *Aggregatibacter actinomycetemcomitans*

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## Abstrak

Latar belakang: Periodontitis merupakan penyakit inflamasi kronis dan dikenal dalam berbagai klasifikasi, yaitu periodontitis kronis, periodontitis agresif, necrotizing periodontitis, dan periodontitis sebagai manifestasi penyakit sistemik. Periodontitis agresif ditandai dengan meningkatnya proporsi bakteri *Aggregatibacter actinomycetemcomitans*, namun belum terdapat studi yang secara spesifik membuktikan interaksi langsung antara sel bone marrow-derived macrophages (BMM) sebagai prekursor sel osteoklas dengan bakteri *Aggregatibacter actinomycetemcomitans*. Tujuan: Menganalisis interaksi langsung antara sel BMM dengan bakteri *Aggregatibacter actinomycetemcomitans*. Metode: Sel bone marrow dikultur selama 48 jam untuk menjadi sel BMM dan kemudian diinfeksi oleh bakteri *Aggregatibacter actinomycetemcomitans* selama 5, 15, dan 30 menit pada kondisi aerob dan anaerob. Data jumlah koloni bakteri *Aggregatibacter actinomycetemcomitans* didapatkan melalui uji total plate count (TPC). Analisis kuantitatif melalui uji statistik. Hasil: Terjadi peningkatan bermakna jumlah koloni bakteri pada kelompok bakteri *Aggregatibacter actinomycetemcomitans* yang berinteraksi dengan sel BMM, dibanding tanpa sel BMM pada kelompok paparan aerob 5 dan 15 menit. Tidak terdapat perbedaan pada jumlah koloni bakteri *Aggregatibacter actinomycetemcomitans* yang diinfeksi pada kondisi aerob atau anaerob. Tidak ada perbedaan bermakna pada jumlah koloni bakteri *Aggregatibacter actinomycetemcomitans* yang diinfeksi selama 5 menit, 15 menit, dan 30 menit. Kesimpulan: Interaksi langsung antara sel BMM dengan bakteri *Aggregatibacter actinomycetemcomitans* memengaruhi proliferasi bakteri *Aggregatibacter actinomycetemcomitans*. Proliferasi bakteri *Aggregatibacter actinomycetemcomitans* dipengaruhi oleh kondisi aerobik dan anaerobik, namun tidak dipengaruhi lama waktu infeksi.

.....Background: Periodontitis is a chronic inflammatory disease and classified as chronic periodontitis, aggressive periodontitis, necrotizing periodontitis, and periodontitis as a manifestation of systemic disease. Aggressive periodontitis is characterized by an increased in *Aggregatibacter actinomycetemcomitans* proportion. There has not been any studies that have shown the direct interactions between bone marrow derived macrophages cells, as osteoclast precursor cells, with *Aggregatibacter actinomycetemcomitans*. Purpose: To analyse direct interactions between bone marrow derived macrophages (BMM) cells and *Aggregatibacter actinomycetemcomitans*. Methods: Bone marrow cells from C57BL/6 mice were cultured for 48 hours in order to differentiate into BMM cells. BMM cells were then infected with *Aggregatibacter actinomycetemcomitans* for 5 minutes, 15 minutes, and 30 minutes in an aerobic and anaerobic environment. Total plate count of *Aggregatibacter actinomycetemcomitans* were analysed as a quantitative data using statistical analysis Results: Statistically, significant difference between *Aggregatibacter actinomycetemcomitans*-infected BMM and control group were observed on 5 minutes and 15 minutes aerobic groups. There were no statistically difference in *Aggregatibacter actinomycetemcomitans* colony count number between cultures in aerobic or anaerobic environment. No statistically significant difference

were found in *Aggregatibacter actinomycetemcomitans* colony count number between 5, 15, and 30 minutes infection time. Conclusions: Direct interactions between BMM cells and *Aggregatibacter actinomycetemcomitans* affect *Aggregatibacter actinomycetemcomitans* proliferation. Bacterial proliferation is affected by aerobic or anaerobic environments, but not infection time