

Porphyromonas salivosa ATCC 49407 fimbriae induced osteoclast differentiation and cytokine production

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Abstract

Porphyromonas salivosa ATCC 49407 (*P. salivosa*) is a black-pigmented, anaerobic, Gram-negative and rod-shaped organism. *P. salivosa* is often isolated from the gingival sulcus of various animals including dogs and cats. We examined the involvement of the fimbrial protein in osteoclast differentiation and cytokine production in murine macrophages. Furthermore, alveolar bone resorption induced by *P. salivosa* infection in rats was evaluated. Fimbrial protein was purified from *P. salivosa* by selective protein precipitation and chromatography on a DEAE CL-6B anion exchange column. Western blotting analysis was performed with PABs against fimbrial protein from *P. salivosa*. Expression of fimbriae on the surface of *P. salivosa* was investigated using transmission electron microscopy. To estimate osteoclast differentiation, bone marrow cells and MC3T3-G2/PA6 cells were cultured with or without the purified fimbrial protein for 7 days. BALB/c mouse peritoneal macrophages were stimulated with the purified fimbrial protein and cytokine production was determined by ELISA. Special pathogen-free 3-week-old

male Sprague-Dawley rats were infected with *P. salivosa*. 45 days after the last infection, jaws were removed and cleaned and the periodontal bone levels were determined by a morphometric measurement. The 60-kDa fimbrial protein of *P. salivosa* induced osteoclast formation and induced IL-1 β and TNF- α production. Rats orally infected with *P. salivosa* exhibited significant alveolar bone loss. Consequently, *P. salivosa* fimbriae may play an important role in induction of periodontal diseases. These results suggest that *P. salivosa* 60 kDa fimbriae may provoke an inflammatory response in host and be involved in periodontal tissue breakdown.

Biography:

Keitaro Inaba has completed his graduation in the field of Dentistry from Kyushu Dental University, Japan.