Inhibition of hemagglutinating activity by monoclonal antibody against Porphyromonas gingivalis 40-kDa outer membrane protein

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Abstract

Periodontitis is a chronic inflammatory disease of periodontal tissues that results in alveolar bone loss, and Porphyromonas gingivalis, which has a high hemagglutinating activity, has been implicated as an important pathogen in the development of periodontitis. This bacterium has a high hemagglutinating activity. We previously succeeded in gene cloning the 40-kDa outer membrane protein (OMP) from P. gingivalis 381. Although recombinant (r) 40-kDa OMP itself did not show hemagglutinating activity, its polymeric form, constructed with a cross-linking reagent, significantly expressed that activity. Furthermore, an affinity-purified antibody against r40-kDa OMP inhibited the hemagglutinating activity of P. gingivalis vesicles. In the present study, in order to clarify the pathological role of 40-kDa OMP and develop passive immunotherapy, we examined the inhibitory effect of monoclonal antibodies (MAbs) against r40-kDa OMP on the hemagglutinating activity of P. gingivalis vesicles. The MAbs reacted with r40-kDa OMP, the outer membrane fraction, vesicles, and P. gingivalis cell extracts, and significantly inhibited the hemagglutinating activities of the polymeric r40-kDa OMP as well as of P. gingivalis vesicles. These findings suggest that MAbs against 40-kDa OMP may be useful for the development of passive immunotherapy and for assessing treatment for periodontal diseases caused by P. gingivalis infection.