VIRAL ANTI-INFLAMMATORY PROTEINS REDUCE ACCELERATED ATHEROSCLEROSIS IN APOENULL MICE WITH PERIODONTAL BACTERIAL INFECTION AND ANGIOPLASTY INJURY

ACC Poster Contributions
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Background: Prior studies have detected periodontal bacterial genomic DNA, including Porphyromonas gingivalis (Pg), in atherosclerotic lesions. Two potent viral anti-inflammatory proteins (VPs), Serp-1 (protease inhibitor) and M-T7 (chemokine binding protein) inhibit vascular inflammation and plaque growth in animal models and in a pilot clinical study in acute coronary syndromes (Serp-1).

Methods: We have examined the effects of the VPs in ApoEnull mice with P. gingivalis infection with and without angioplasty injury. Methods. ApoEnull mice had balloon angioplasty (BA) injury followed by Serp-1, MT-7, or control saline i.v. infusion. Subsequently, mice were infected with P. gingivalis strain 381 as oral gavage over 20 weeks with assessment of periodontal disease and atherosclerosis. Oral bacterial samples were collected and colonization/infection assessed by PCR. Mice were euthanized at 20 weeks after infection. Serum IgG antibody, alveolar bone resorption (ABR), atherosclerotic plaque growth, inflammatory mononuclear cell, and bacterial genomic DNA responses to P. gingivalis infections are being evaluated by ELISA, morphometry, histomorphometry and PCR, respectively.

Results: PCR detected P. gingivalis in nearly all mice throughout the experimental interval. All mice infected with P. gingivalis demonstrated elevated IgG antibody compared to control mice. P. gingivalis induced greater maxillary and mandibular (buccal and palatal) horizontal ABR than control mice. P. gingivalis increased mononuclear cell invasion and intimal plaque to medal ratios in the abdominal aorta of non injured ApoEnull mice (P < 0.017) but not in mice with angioplasty injury (P = 0.17) when compared to uninfected control mice. Serp-1 and MT-7 inhibited intimal plaque and inflammatory mononuclear cell invasion in mice after angioplasty injury (P < 0.04).

Conclusions: This is the first study demonstrating virus derived anti-inflammatory protein (VP) modulation of plaque growth after angioplasty injury during active P. gingivalis periodontal infection in ApoEnull mice. VP treatment has the capacity to reduce monocyte invasion and plaque growth even during active oral bacterial infection.