Different effects of porphyromonas gingivalis lipopolysaccharide and TLR2 agonist Pam3CSK4 on the adhesion molecules expression in edothelial cells

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Abstrak

Recent researches suggest an association between periodontitis and cardiovascular disease. Periodontopathic bacteria and/or their component might play a role in the development of atherosclerotic lesions. In the present study, we investigated in vitro the effect of Porphyromonas gingivalis lipopolysaccharide (LPS)on the expression of adhesion molecules in human umbilical vein endhotelial cells (HUVECs) as well as its effect on Escherichia coli LPS-induced response. The effect of P. gingivalis LPS was compared with that of toll-like receptor 2 agonist syntethic triacylated lipoprotein Pam3-Cys-Ser-(Lys)4 (Pam3CSK4). Gene and protein experssion of intercellular adhesion molecule-1, vascular cell adhesion molecule-1, and E-selectin were measured using RT-PCR and flow cytometry, respectively. P. gingivalis LPS stimulated the expression levels of all adhesion molecules in a dose-dependent manner. However, the response of HUVECs to P. gingivalis LPS was markedly lower than that to E. coli LPS. Moreover, P. gingivalis LPS attenuated E. coli LPS-induced responses when HUVECs were simultaneously stimulated with both kinds of LPS. Treatment with Pam3CSK4 resulted in a minor increase of adhesion molecule expression and did not diminish E. coli LPS-induced responses. Our data suggest that P. gingivalis LPS induces in vitro the expression of adhesion molecules in endothelial cells, which might promote atherogenesis. Qualitatively different responses of HUVECs to P. gingivalis LPS and Pam3CSK4 suggest that besides TLR2 other signaling pathways might be involved in the effects of P. gingivalis LPS.