Expression of Host Pattern Recognition Proteins in Periodontal Tissue

L. JIN[1], L. REN[1], W.K. LEUNG[1], and R. DARVEAU[2], [1]University of Hong Kong, Hong Kong, [2]University of Washington, Seattle, USA

Objectives: Lipopolysaccharide (LPS) is a primary inducer of chronic inflammatory diseases. It is the best characterized pathogen-associated molecular pattern able to trigger host inflammatory response. The resultant host response is modulated by a series of host pattern recognition receptors. This study aimed to investigate the local expression profiles in human gingiva and levels of two key host pattern recognition proteins, LPS-binding protein (LBP) and membrane CD14 (mCD14), and to evaluate their associations with periodontal health and disease. Methods: Gingival biopsies were collectively obtained from a group of patients with chronic periodontitis, including periodontal pocket tissues (PoTs) and clinically healthy tissues (HT-Ps), and from periodontally healthy subjects as controls (HT-Cs). The peptides and mRNAs of mCD14 and LBP were detected by immunohistochemistry and reverse transcription-polymerase chain reaction, respectively. Results: mCD14 and LBP peptides were detected respectively in (mCD14/LBP) 95.5%/90.9% of PoTs, 100%/84.6% of HT-Ps and 100%/100% of HT-Cs. CD14 mRNA was detected in all categories of samples, while LBP message was detected in 55% of PoTs, 55% of HT-Ps and 75% of HT-Cs. mCD14 peptide expression was mainly confined to the cells around the epithelium-connective tissue interface, while LBP peptide expressed at the granular and keratinized layers of gingival epithelium, spreading from sulcular epithelium to oral epithelium with the expression density decreasing gradually from coronal to apical portion. LBP peptide was also found on endothelial surfaces and/or inside the lumen of blood vessels in connective tissues. The expression levels of both mCD14 and LBP proteins in HT-Cs were significantly higher than in the patients ($p<0.05$). Conclusions: We for the first time found the local expression of LBP peptide and mRNA in human gingiva. Both mCD14 and LBP were commonly expressed in healthy and diseased gingival tissues. Appropriate expression of both pattern recognition proteins in gingival tissues may contribute to periodontal homeostasis.

Periodontal Research - Pathogenesis

The Preliminary Program for The 5th Annual Meeting of the IADR Chinese Division (June 3 - 5, 2004)