Up-regulation of Antigen Presenting Cell-related Molecules and Toll-like Receptors mRNAs at the Early Phase of Experimentally-induced Furcal Inflammation in the Rat Molar

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Abstract: We recently investigated, by using real-time PCR analysis, the expression levels of mRNAs for some antigen presentation-related molecules and toll-like receptor 4 (TLR4) in different regions of the normal periodontal ligament of rat molars, and demonstrated that the levels were the highest in the furcal region. In order to further examine the early immunopathogenesis of pulp infection-induced furcal inflammation, in this study we induced furcal inflammation in rat molars by making unsealed pulp exposures for 1 day. Real-time PCR analyses of MHC class II, CD83 (predicted), CD86, TLR4, TLR2 and IFN-γ mRNAs were then performed for the furcal region of the inflamed periodontal ligament. Those from normal teeth served as controls. The results demonstrated that expression levels of all the mRNAs except for IFN-γ mRNA showed significant increases in the inflamed furcal region compared with controls. These findings suggest that maturation and/or activation of antigen-presenting cells residing in the furcal region may occur as an early event in response to pulpally-derived bacterial challenges.

Key words: Periodontal ligament, Antigen presenting cell, Real-time PCR