

Expression of Toll-like receptors 2 and 4 and its association with matrix metalloproteinases in symptomatic and asymptomatic apical periodontitis

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To determine Toll-like receptors (TLR)2 and TLR4 expression levels and associate them with matrix metalloproteinases (MMPs) in asymptomatic apical periodontitis (AAP), symptomatic apical periodontitis (SAP), and healthy controls. Apical tissue/lesion samples were obtained from chronic AAP (n = 35) and SAP (n = 29), and healthy periodontal ligament (HPL, n = 10) with indication of tooth extraction, respectively. mRNA expression levels of TLR2, TLR4, MMP-1, MMP-2, MMP-8, and MMP-13 were determined by real-time reverse-transcription polymerase chain reaction. The data were analyzed with Kruskal-Wallis and Dunn's post hoc test ($p < 0.05$). The correlation coefficient was obtained using the Spearman correlation ($p < 0.05$). TLR2, MMP-1, MMP-2, and MMP-13 mRNA levels were the highest in SAP followed by AAP and controls ($p < 0.05$). TLR4 and MMP-8 were over expressed in AAP and SAP compared to HPL ($p < 0.05$). TLR2 positively correlated with TLR4, MMP-1, MMP-8, and MMP-13 in SAP ($p < 0.05$). TLR2 and TLR4 are overexpressed in apical lesions versus healthy periodontal ligament and correlate with collagenolytic MMPs. Particularly, TLR2 is overexpressed in SAP in association with MMP-1, MMP-8, and MMP-13. Our results suggest that the activation of TLR2 along with MMP overexpression might contribute to SAP clinical presentation and progression. TLRs, MMPs, and their interaction can

explain the clinical presentations and evolution of apical periodontitis and might represent key targets for new diagnostic and treatment approaches. © 2019, Springer-Verlag GmbH Germany, part of Springer Nature.

Matrix metalloproteinases

Periapical periodontitis

Toll-like receptor 2

Toll-like receptor 4

matrix metalloproteinase

toll like receptor 2

toll like receptor 4

cross-sectional study

drug effect

genetics

human

metabolism

pathology

periodontal ligament

tooth apex

tooth periapical disease

Cross-Sectional Studies

Humans

Matrix Metalloproteinases

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Toll-Like Receptor 2

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Tooth Apex