Bone resorptive activity in symptomatic and asymptomatic apical lesions of endodontic origin

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Objectives: The aim of this study is to assess the levels and diagnostic accuracy of a set of bone resorption biomarkers, including TRAP-5, RANKL, and OPG in symptomatic and asymptomatic apical lesions and controls. Materials and methods: Apical tissues from symptomatic and asymptomatic apical periodontitis patients and periodontal ligaments from healthy teeth extracted for orthodontic reasons were processed for tissue homogenization and the levels of TRAP-5, RANKL, and OPG were determined by multiplex assay. Marker levels were analyzed by Kruskal Wallis test, and diagnostic accuracy was analyzed with ROC curves. Results: Higher levels of RANKL, OPG, and RANKL/OPG ratio were determined in both types of apical lesions compared to healthy periodontal ligament, whereas higher TRAP-5 levels were found only in symptomatic apical lesions ($p < 0.05$). OPG, RANKL, and RANKL/OPG ratio showed diagnostic potential to identify apical lesions versus healthy controls (AUC = 0.69, $p < 0.05$); while TRAP-5 showed a potential to discriminate symptomatic versus asymptomatic apical periodontitis (AUC = 0.71, $p < 0.05$) and healthy controls (AUC = 0.83, $p < 0.05$). Conclusions: Apical lesions showed higher RANKL and OPG levels than healthy tissues. TRAP-5 levels were the highest in symptomatic apical lesions, suggesting that these represent a progressive state, and showed diagnostic potential. Clinical relevance: Clinically symptomatic apical periodontitis might represent biologically progressive apical

lesions based on TRAP5 levels. TRAP5 has diagnostic potential to identify these lesions, representing a candidate prognostic biomarker.

Asymptomatic periapical periodontitis

Biomarkers

Bone resorption

OPG

RANKL

Symptomatic

TRAP

acid phosphatase tartrate resistant isoenzyme

ACP5 protein, human

biological marker

osteoclast differentiation factor

osteoprotegerin

adolescent

female

human

male

middle aged

osteolysis

pathology

periodontal ligament

tooth periapical disease

Adolescent

Biomarkers

Bone Resorption

Female

Humans

Male

Middle Aged

Osteoprotegerin

Periapical Periodontitis

Periodontal Ligament

RANK Ligand

Tartrate-Resistant Acid Phosphatase