

Abstract

Objectives: Using SELDI-TOF-MS we have previously identified putative salivary biomarkers of periodontitis. Some of these identified peaks were predicted to be antimicrobial peptides (AMPs), specifically alpha defensins 1-3 (HNP 1-3) and cathelicidin (LL-37). AMPs are cationic peptides produced by neutrophils and are important in innate and adaptive immunity. Thus the aim of this study was to investigate further salivary HNP 1-3 and LL-37 concentrations as potential diagnostic biomarkers for gingivitis (G), chronic periodontitis (CP) and aggressive periodontitis (AgP). Methods: WS was collected using salivettes in subjects with G (n=18), CP (n=22) and AgP (n=20) and measured using SELDI-TOF-MS. We also tested the effect of non-surgical therapy in an independent AgP cohort (n=47). ELISAs for HNP1-3 and LL-37 were carried out to confirm and quantify the data. Difference in expression levels were analyzed using ANOVA and Bonferoni's correction ($P < 0.05$). Results: HNP1-3 and LL-37 were first identified by SELDI-TOF-MS and LC-MS/MS confirmed their identity. Using ELISAs, HNP 1-3 levels were significantly higher in CP than in G ($p=0.01$; $0.7\mu\text{g/ml}$ and $0.2\mu\text{g/ml}$ respectively) and before treatment than after treatment ($p=0.045$; $0.92\mu\text{g/ml}$ and $0.41\mu\text{g/ml}$ respectively). LL-37 levels were significantly higher in AgP than in both G & CP ($p=0.007$ & $p=0.013$ respectively) with 100% sensitivity and specificity for AgP vs G ($p=0.0003$) and 100% sensitivity and 81.8% specificity for AgP vs CP ($p=0.002$). Conclusion: Salivary HNP1-3 and LL-37 can differentiate G, CP & AgP with high specificity and sensitivity. Further investigations in larger independent cohorts will assess how useful these AMPs are in discriminating periodontal disease status.