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Saliva Inflammation Markers and Association With Periodontal Outcomes

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Objectives Large screening panels of saliva inflammation proteins make it possible to explore biomarkers of periodontal disease severity, ultimately to be used to monitor periodontitis. We aimed to explore saliva inflammation markers associated with periodontitis severity, bleeding on probing (BoP) and pocket depths (PD) in a cohort of older adults.

Methods A total of 228 saliva samples from 70-years-old adults in Western Norway, were analyzed for 92 inflammatory protein markers (Olink Proteomics, Bevital, Bergen, Norway). Saliva samples were collected concurrently with a thorough clinical examination including clinical attachment loss (CAL), BoP and PD. Participants were grouped by periodontitis severity: no periodontitis (n=19), non-severe (n=142) and severe (n=67) in accordance with Eke et al (2015).

Results In the present study, C-X-C Motif Chemokine Ligand 5 (CXCL5) decreased with decreasing proportion of sites with BoP (rho=0.15, p=0.03) and the lowest concentrations of CXCL5 were found in participants with severe periodontitis compared to those with no periodontitis (p=0.02). Also, tumor necrosis factor-related apoptosis-inducing ligand (TRAIL) decreased with severe and non-severe periodontitis compared to healthy (p=0.02). Furthermore, Delta and Notch-like epidermal growth factor-related receptor (DNER) decreased with increasing proportion of sites with BoP (rho=-0.19, p=0.003) and with increasing mean periodontal PD (rho=-0.21, p=0.002). Hepatocyte growth factor (HGF) increased with proportion of sites with BoP (rho=0.23, p<0.0001) and mean periodontal PD (rho=1.58, p=0.017). Furthermore, adenosine deaminase (ADA) and salivary urokinase (uPA) were found to increase with BoP (rho=0.24, p<0.0001 and rho=0.19, p=0.004, respectively) and with periodontal PD (rho=0.14, p=0.03) and 0.05 (rho=0.12), respectively).

Conclusions We found that salivary HGF and CXCL5 to be associated with periodontitis. In addition, the recently described inflammatory biomarkers TRAIL, DNER, ADA and uPA were also associated with periodontal parameters in this cohort of older adults.