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Quantifying oral inflammatory load: oral neutrophil counts in periodontal health and disease

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Abstract

Background and objective: Neutrophils are the primary white blood cells that are recruited to fight the initial phases of microbial infections. While healthy norms have been determined for circulating blood neutrophil counts in order to identify patients with suspected systemic infections, the levels of oral neutrophils (oPMNs) in oral health and in the presence of periodontal diseases have not been described. It is important to address this deficiency in our knowledge as neutrophils are the primary immune cell present in the crevicular fluid and oral environment and previous work has suggested that they may be good indicators of overall oral inflammation and periodontal disease severity. The objective of this study was to measure oPMN counts obtained in a standardized oral rinse from healthy patients and from those with chronic periodontal disease in order to determine if oPMN levels have clinical relevance as markers of periodontal inflammation. A parallel goal of this investigation was to introduce the concept of 'oral inflammatory load', which constitutes the inflammatory burden experienced by the body as a consequence of oral inflammatory disease.

Material and methods: Periodontal examinations of patients with a healthy periodontium and chronic periodontal disease were performed (n = 124). Two standardized consecutive saline rinses of 30 s each were collected before patient examination and instrumentation. Neutrophils were quantified in the rinse samples and correlated with the clinical parameters and periodontal diagnosis.

Results: Average oPMN counts were determined for healthy patients and for those with mild, moderate and severe chronic periodontal diseases. A statistically significant correlation was found between oPMN counts and deep periodontal probing, sites with bleeding on probing and overall severity of periodontal disease.

Conclusions: oPMN counts obtained through a 30-s oral rinse are a good marker of oral inflammatory load and correlate with measures of periodontal disease severity.

Keywords: cell count; neutrophils; periodontal disease; rinse test.

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