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Novel rinse assay for the quantification of oral neutrophils and the monitoring of chronic periodontal disease

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Abstract

Background and Objectives: The aim of this study was to develop a single, rapid, noninvasive oral rinse assay to enable the accurate quantification of oral neutrophils. Products released by neutrophils are partly responsible for the destruction observed in periodontitis. Quantification of oral neutrophil levels is important for understanding their role in periodontal diseases. Previous studies have relied on time-consuming serial rinses and cumbersome counting techniques for the collection and quantification of oral neutrophils.

Material and Methods: Patients with chronic periodontal disease provided rinse samples before and



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after phase I periodontal treatment. Cells in the rinse samples were stained with acridine orange, and neutrophil counts were carried out using a fluorescence microscope and a hemocytometer.

Results: This assay allowed us to detect a significant difference in pretreatment oral neutrophil counts between periodontal disease and healthy control groups ($p < 0.001$). Patients who responded favorably to phase I therapy demonstrated a 43% reduction in oral neutrophil counts compared with their pretreatment levels ($p = 0.019$). Patients who did not respond to phase I periodontal treatment showed no significant difference in oral neutrophil levels ($p = 0.39$).

Conclusion: Oral neutrophil levels, as determined by a rapid oral rinse, reflect the severity of periodontal disease and treatment response. A single, rapid, oral rinse assay is an effective means of collecting and quantifying oral neutrophil levels and may serve as an excellent research tool for further study of the role of neutrophils in periodontal diseases.

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