

## Periodontal disease: The Influence of Metabolic Syndrome

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### Abstract

Nearly 50% of people over the age of 29 in the U.S. develop periodontitis, commonly known as gum disease. This percentage increases by 20% for those over 65. Periodontitis causes more than just dental damage; *Porphyromonas gingivalis* (Pg), a periodontopathic bacteria produced at the onset of infection undergoes an inflammatory pathway. Moreover, local inflammation caused by Pg results in systemic inflammation and impaired immune response, suggesting that periodontitis plays a role in the development of metabolic syndrome. Systemic inflammation and fat metabolism are directly related in effect with this immune response, however our understanding of the relationship between periodontitis and the development of metabolic syndrome is unclear. My aim was to investigate the hypothesis that Pg has a direct effect by triggering insulin resistance and decreasing glucose uptake alongside altering healthy gut microbiota which causes an increase in obesity, a risk factor for metabolic syndrome. To do this, I reviewed several scientific journal articles that conducted cohort research analysis on mice infected with Pg and human participants with preexisting periodontitis. Methods used involved measurement of inflammatory cytokine levels, adipose tissue production, and insulin and glucose levels. Major results supported that gut bacteria alteration elicited by Pg causes gut inflammation via the release of pro-inflammatory cytokines. The mice showed increased insulin resistance, which resulted in fat storage in white and brown adipose tissues, suggesting that Pg causes obesity, a significant precursor for metabolic syndrome. Moreover, my review of these articles emphasizes the importance of oral hygiene to avoid downstream health problems.