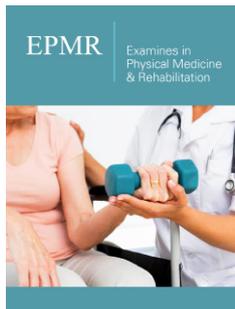


Periodontal Pathogens as an Obesity Risk Factor

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Abstract

In recent decades, obesity has become one of the most common lifestyle-related metabolic disorders. Excess body weight can lead to a number of diseases, such as diabetes, hypertension and cardiovascular disease. Epidemiological studies have shown that obesity may be a risk factor for periodontal diseases. As obesity, periodontitis can contribute to chronic inflammation, both the need for periodontitis treatment in obese patients and the negative contribution of obesity to surgical and non-surgical treatment of periodontitis must be considered.

Keywords: Obesity; Metabolic disorders; Diabetes; Hypertension; Cardiovascular disease; Periodontal diseases

Introduction

In recent decades, obesity has become one of the most common lifestyle-related metabolic disorders. Excess body weight can lead to a number of diseases, such as diabetes, hypertension and cardiovascular disease. [1] Epidemiological studies have shown that obesity may be a risk factor for periodontal diseases [2].

Periodontal Disease and Obesity

Periodontal disease is an inflammatory disease that affects the surrounding and supporting tissues of the teeth. Periodontitis is a multifactorial disease, the development of which depends on many factors, including heredity, environmental conditions, diet, etc [3]. People with the same microbiological profile may show different susceptibility to periodontal disease. Infection is a significant factor in the development of periodontitis, the main group of periodontal pathogens are gram-negative bacteria: *Porphyromonas gingivalis*, *Aggregatibacter actinomycetemcomitans*, *Prevotella intermedia*, *Tannerella forsythia* *Fusobacterium nucleatum* and *Treponema denticola* [4]. There are various theories linking periodontitis and obesity, but a certain mechanism remains unexplored. Activation of immune cells in adipose tissue leads to impaired immune function in obesity, various cytokines and chemokines secreted in adipose tissue contribute to increased inflammation [5]. The combination of obesity and periodontitis increases inflammation to levels that affect the entire body through adipose tissue [6]. Frequent bacteremia and systemic spread of local inflammation occur in patients with periodontitis, potentially provoking metabolic disorders. [7]. In a mouse model, the combination of a high-fat diet and periodontitis was shown to increase dyslipidemia, glucose tolerance, and liver damage [8]. There is evidence that *Aggregatibacter actinomycetemcomitans* is able to suppress the secretion of anti-inflammatory cytokines, thereby increasing systemic inflammation [9]. *T. forsythia* has been shown to promote adherence to fatty foods [10]. *P. gingivalis* increases the expression of inflammation-related genes and reduces the expression of UCP1 and Cidea, as well as lipolysis-related genes Pnpla2 and Lipe [11]. The presence of *Porphyromonas gingivalis* and *Tannerella forsythia* has been associated with increased BMI in young adults [12]. There is evidence that obesity reduces the effectiveness of periodontitis therapy [13]. Also, on the contrary, periodontitis therapy contributed to weight loss in obese individuals [10]. In addition, oral cavity bacteria are able to penetrate into the intestine and

change the ratio of the gut microbiota, causing both intestinal inflammatory diseases and promote oncological transformation [14].

Discussion

Periodontitis and obesity are multifactorial diseases that can influence each other through various mechanisms, the main of which seems to be chronic inflammation. It is reasonable to assume that the treatment of periodontitis in obese individuals requires collaboration between dentists and other health care providers such as physicians, nutritionists, and physical therapists.

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