

Relationship Between Obesity and Periodontal Diseases in Children and Adolescents: The Importance in the Development of the Health of Youth

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Recently, overweight and obesity affects a great part of the world population, and its prevalence has increased worldwide, especially among women^{1,2}. Nowadays, obesity is known as one of the greatest problems in public health, becoming a risk factor to many other systemic conditions, such as cardiovascular diseases, diabetes mellitus, cancer, osteoarthritis and gallbladder disease^{1,3-6}. Obesity also compounds the metabolic syndrome, in association with dislipidemia, arterial hypertension, glucose intolerance and insulin resistance^{4,7}.

Among the pathogenic mechanisms of the obesity etiology, as well as the one from the metabolic syndrome, there is a complex interaction between genetic, metabolic and environmental agents, suggesting that the pro-inflammatory state may considerably contribute to the development of these complications^{4,7}.

The periodontal diseases (Figure 1) are a group of disorders that undertake the support tissues of the teeth. It is represented, on a first level, by gingivitis, a reversible inflammatory response to the dental plaque. Later, it can extend itself and turn into a periodontitis, which becomes irreversible to the inflammatory response, due to subgingival biofilm, compound by Gram-negative anaerobic bacteria. These periodontal pathogens present a more invasive capability and liberate endotoxins that activate pro-inflammatory cytokines (IL-1, IL-6, IL-8, TNF- α , PGE₂, and others). In addition, the ulcerated epithelium of periodontal pockets favour the communication between the infection agents and its products and the bloodstream, activating an inflammatory response in larger proportions^{3,4,6-8}. Even distant, the periodontitis can stimulate the hepatic cell to produce cytokines in larger quantities, and by the elevated levels of C-reactive protein and homocysteine, also contributes to the state of insulin resistance⁷.

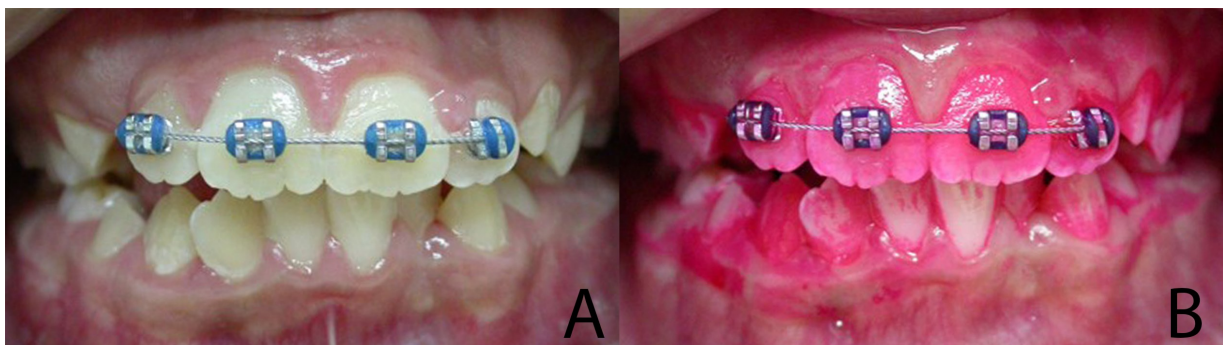


Figure 1: Clinical features of the periodontal disease in an adolescent (A). Evidence of plaque for the oral hygiene instruction consultation (B).

In a representative sample of US adolescents, weight and waist circumference were associated with increased risk of periodontitis among those aged 17 to 21 years. In these adolescents, the risk to develop periodontitis increased 6% for each 1 kg gained in the body weight, and 5 % in each centimeter gained in the waist circumference⁹. This data suggest that periodontitis is associated with central obesity in children and adolescents, as well as in adults, and that it can be a comorbidity of obesity, originating a cycle of diseases related to obesity^{4,8,9} (Figure 2).

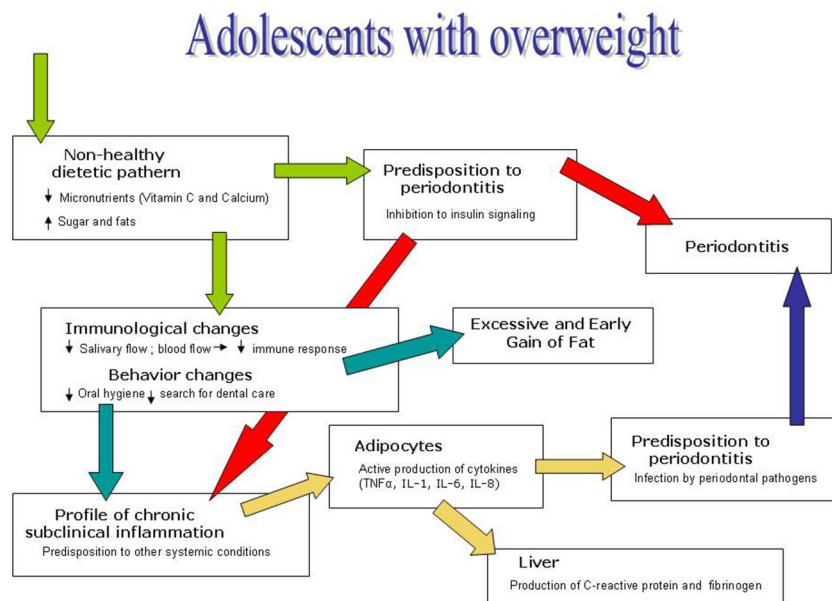


Figure 2: Flowchart of the relationship between obesity and periodontal diseases.

In a preliminary Brazilian study, the elevation of homocysteine levels, C-reactive protein, uric acid and creatinine was demonstrated in patients with periodontal diseases and metabolic syndrome, in comparison with healthy patients, although it was not observed a significant relationship between periodontitis and metabolic syndrome⁷. In another study, obesity was significantly associated to periodontitis in adult women who where not smokers. There was no significant relationship between overweight and periodontitis¹. However, Chapper et al.² correlated gestational diabetes mellitus and pre-gestational obesity and periodontal attachment loss in obese pregnant patients compared with those with a normal pre-gestational Body Mass Index. Statistically significant differences in gingival bleeding and clinical attachment loss were observed between the normal group and the obese group. Bleeding on probing was related to the increase in Body Mass Index.

An Italian study presented the association between obesity indicators (Body Mass Index) and periodontal risk in children. Obese children had statistically significant higher Plaque Index and bleeding on probing compared to non-obese children. Although the clinical attachment level was higher in obese children, no statistically significant difference was observed in relation to non-obese children⁶.

Another Swedish study showed a higher prevalence of gingival inflammation and periodontal pockets in obese patients compared to non-obese patients. No difference was observed in alveolar bone loss between obese and non-obese patients. However, the biochemical levels of IL-1 β and IL-8 from the gingival crevicular fluid were higher in obese patients. The authors concluded that the Body Mass Index adjusted for gender and age was significantly associated with the occurrence of pathological diseases and periodontal pockets³.

In Belgium, Marro et al. observed greater experience of caries, gingivitis, presence of plaque and periodontal problems, in obese adolescents compared to non-obese adolescents. There was no statistically significant difference in the prevalence of erosive tooth wear. Obesity was associated only with the presence of dental plaque¹⁰.

Halder et al. observed an association between obesity and oral health status in children, particularly regarding oral hygiene. In India, obese children had worse oral hygiene, poor plaque control and higher caries incidence, compared to non-obese children⁵.

Besides carious lesions and periodontal diseases, obesity has been reported to be related to erosive dental wear¹⁰. Like obesity, they are also caused by behavioural factors determined by bad habits, such as diet (food and drink), eating habits (night eating), poor oral hygiene and health conditions related to general health, such as reflux or frequent vomiting¹¹⁻¹⁴.

Obesity and other metabolic conditions present a high level of mortality and morbidity^{2,4,6-8}. Knowing the possible risk factors of these diseases to prevent or cure them is a priority, since there are existing evidence indicating that inflammatory conditions may contribute to the emergence of these disorders. The reduction of circulant inflammatory mediators has also been reported after periodontal treatment had been provided, thereby improving insulin resistance^{2,4,7,8}.

This brief research points out obesity as a potential marker of periodontal diseases among adolescents. Medical and dental professionals should develop interdisciplinary approaches for identifying and treating early signs of oral disease among children and adolescents. The oral health of overweight or obese individuals must be cared for and supervised, avoiding future degenerative oral alterations. The collaboration for the control of these pathological alterations - periodontal diseases and obesity - can help and avoid future collapses in public health.

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