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[Mini-review] Periodontal Medicine: Impact of Oral Health on General Health

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Abstract

This mini-review addresses the critical interconnection between oral health, specifically periodontal disease, and overall general health. It highlights the bi-directional relationship between periodontitis and systemic conditions such as diabetes, cardiovascular diseases, and complications during pregnancy. The review emphasizes the exacerbation of periodontal issues in the presence of lifestyle factors like smoking and stress, and the potential risks they pose to systemic health. Recent findings connecting periodontitis with increased complications in COVID-19 patients are also discussed. The paper underscores the importance of multidisciplinary care and the role of oral health in the prevention and management of systemic diseases, concluding with a call for greater awareness and preventive strategies in healthcare.

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The advancement of science in health area has allowed Dentists and Doctors to gather sufficient evidence to prove the interrelationship between oral health and general health. The main area of Dentistry that has studied this correlation is Periodontics.

Periodontal disease is the clinical manifestation of an immuno-inflammatory process that occurs in periodontal tissues, in response to the presence of a mature biofilm. Biofilm is the association of microorganisms in a matrix that, together, are adhered to teeth or prostheses. Biofilm favors the maintenance of microorganisms in the oral cavity. It is not always calcified and apparent in the form of calculus (Carranza et al., 2020; Lindhe et al., 2018). It is important to consider that microorganisms are naturally part of the oral environment. However, its routine disorganization through daily hygiene

habits and periodic professional consultations ensures that this biofilm is compatible with health levels and reduces the risk of manifesting as oral diseases (Carranza et al., 2020; Lindhe et al., 2018).

Periodontics is showing strong scientific evidence on the correlation between oral health and general health. The biggest example we can cite recently refers to the last two years, with the COVID-19 pandemic when it was observed that patients with periodontitis are at risk of more serious complications when affected by SARS-CoV-2: they are 3.5x more likely hospitalization in ICU; 4.5x more likely to need assisted mechanical ventilation; 8.8x more likely to die (Marouf et al., 2021).

The most strongly proven scientific evidence of this relationship to date is between periodontitis and diabetes. There is a strong association between hyperglycemia and the prevalence of more severe cases of periodontitis. Patients with hyperglycemia present a more exacerbated inflammatory reaction in response to the presence of bacterial plaque that forms on the teeth. Furthermore, there is a greater risk of periodontal abscesses (infections) (Jepsen et al., 2018). The relationship between periodontitis and diabetes is a two-way street: patients with untreated periodontitis may have difficulty controlling blood glucose (Jepsen et al., 2018). Considering the great importance of oral health status for maintaining the general health of patients, the Brazilian Society of Periodontology (SOBRAPE) in partnership with the Brazilian Society of Endocrinology and Metabolism (SBEM) recently published guidelines on the clinical management of oral health. relationship between diabetes and periodontitis, with recommendations for dentists, the public health system, doctors and patients (Stefens et al., 2022).

Smoking also has several consequences on the oral cavity, from the simplest, such as tooth pigmentation, to the most complex, such as oral cancer. Smoking can negatively influence the health of the tooth-supporting tissues (periodontium), and can even lead to their early loss. The same consequences can be observed with dental implants. The effects on smokers (active and passive) are dose-dependent. Eliminating the smoking habit and having follow-up appointments with a dentist helps to restore oral (and general) health (Carranza et al., 2020; Lindhe et al., 2018).

Patients who have periodontitis (a disease that affects the supporting tissues of the teeth) are also at increased risk for cardiovascular diseases such as myocardial infarction and stroke. Furthermore, patients with periodontitis and diagnosis of these and other diseases (such as high blood pressure) are at greater risk of complications. The European Academy of Periodontology and the World Heart Federation recommend that patients diagnosed with cardiac changes should adhere to a regular program of visits to the dentist for treatment, maintenance and prevention of oral diseases (Sanz et al., 2020).

There is some scientific evidence that the hyperinflammatory state caused by obesity may also be related to the development, extent and severity of periodontitis (a disease that affects the supporting tissues of the teeth). Therefore, multidisciplinary monitoring of patients is always important so that global treatment and prevention of general and oral conditions can be carried out (Jepsen et al., 2020). In the context of nutrition, malnutrition must also be considered. The lack of adequate nutrients for the functioning of our body can affect your oral health when associated with an immune response to the presence of bacterial plaque (biofilm) on the surface of the teeth. Malnutrition can be an important predisposing factor for some oral diseases related to rapid destruction of tooth support structures. In cases of malnutrition,

there is a marked reduction in antioxidant nutrients and a reduction in the inflammatory response in the presence of infections. Other consequences are the inverse proportion of defense cells, increased free cortisol in blood and saliva and defects in mucosal integrity.

O atendimento especial das futuras mães no cirurgião-dentista não é somente pela escolha adequada de medicamentos, pelo atendimento no período de gestação adequado ou pelo posicionamento mais confortável da cadeira durante o atendimento. A importância da saúde bucal da gestante também está relacionada com a saúde do bebê. A presença de periodontite pode levar resultados adversos durante a gravidez, como parto prematuro ou bebês de baixo peso ao nascer (Gomes-Filho et al., 2021).

Em relação à qualidade de vida, pode-se mencionar o estresse que é definido como estado de tensão mental ou corporal resultante de condição ou sentimento experimentado quando uma pessoa percebe que as demandas excedem os recursos pessoais e sociais que ele ou ela é capaz de mobilizar. Portanto, resulta das interações do indivíduo com o meio em que vive. Existem inúmeras alterações emocionais e físicas que estão ligadas ao estresse, incluindo depressão, hipertensão arterial, condições cardiovasculares e cerebrovasculares, obesidade e distúrbios do sistema imune. Como esperado, o estresse também pode afetar a saúde bucal, apresentando relação especial com o periodonto, com efeitos diretos e indiretos. Os efeitos indiretos são aqueles mediados pelas mudanças no estilo de vida, que podem exacerbar a destruição periodontal, como a higiene oral comprometida, a falta às visitas ao dentista para prevenção/cuidado, a deterioração do controle metabólico do diabetes, o aumento do tabagismo e a incapacidade de manter hábitos alimentares saudáveis. Os efeitos diretos são mediados pela alteração da composição do biofilme subgengival ou pelo exagero da resposta inflamatória do hospedeiro (Carranza et al., 2020; Lindhe et al., 2018).

Special care for future mothers at the dentist is not just about the appropriate choice of medication, care during the appropriate gestation period or the most comfortable positioning of the chair during care. The importance of pregnant women's oral health is also related to the baby's health. The presence of periodontitis can lead to adverse outcomes during pregnancy, such as premature birth or low birth weight babies (Gomes-Filho et al., 2021).

In relation to quality of life, stress can be mentioned, which is defined as a state of mental or bodily tension resulting from a condition or feeling experienced when a person realizes that demands exceed the personal and social resources that he or she is able to mobilize.. Therefore, it results from the individual's interactions with the environment in which they live. There are numerous emotional and physical changes that are linked to stress, including depression, high blood pressure, cardiovascular and cerebrovascular conditions, obesity and immune system disorders. As expected, stress can also affect oral health, with a special relationship with the periodontium, with direct and indirect effects. Indirect effects are those mediated by lifestyle changes, which can exacerbate periodontal destruction, such as compromised oral hygiene, missed visits to the dentist for prevention/care, deterioration in metabolic control of diabetes, increased smoking and the inability to maintain healthy eating habits. Direct effects are mediated by altering the composition of the subgingival biofilm or exaggerating the host's inflammatory response (Carranza et al., 2020; Lindhe et al., 2018).

The benefits of disseminating information to patients in the community, directly and indirectly improving their quality of life and health. Prevention is the best form of treatment in healthcare.

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