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PERIODONTITIS AND ITS ASSOCIATION WITH SYSTEMIC DISEASES -A REVIEW

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Abstract
Recent years have seen considerable speculation about the potential connections between systemic diseases and periodontal disease. As public awareness of these potential links diminishes, some individuals may feel uncertain about the implications for their own health. It is essential for dentists to be well-informed about the relationship between systemic diseases and periodontitis to provide accurate, evidence-based advice to their patients. This article aims to equip dentists with an overview of the latest research, enabling them to offer informed guidance and support to patients dealing with periodontal diseases and associated systemic conditions.

Keywords: Periodontitis, systemic diseases, diabetes, cardiovascular diseases

INTRODUCTION

The concept of a connection between systemic and oral diseases has been around for over a century. William Hunter introduced the term "focal infection" after discovering associations between oral sepsis and diseases affecting other parts of the body[1,2]. Much of the initial support for this idea was grounded in clinical observations, such as the improvement in overall health following the extraction of infected teeth[3,4]. Atherosclerotic cardiovascular disease, diabetes, and adverse pregnancy outcomes have been key focus areas[7]. Additionally, periodontitis has been associated with various other health conditions, including cancer, rheumatoid arthritis, obesity, metabolic syndrome, chronic kidney disease, and cognitive decline.[8]

The interplay between periodontal diseases and various systemic conditions

Two primary pathogenic pathways have been identified among the many possible mechanisms to explain how periodontal disease may contribute to systemic diseases.

Real-Time Interaction:

As chronic periodontitis advances, the gum tissue near periodontal pockets may ulcerate, allowing bacteria to enter the bloodstream.[9]

Subtle Impact:
Inflammation from periodontal bacteria or their byproducts can lead to systemic health issues. It's widely accepted that inflammation plays a major role in chronic diseases like rheumatoid arthritis, type 2 diabetes and heart disease. Consequently, chronic inflammation associated with ongoing periodontitis may significantly contribute to the onset of additional inflammation-driven disorders. One common method for assessing systemic inflammation is measuring blood levels of C-reactive protein (CRP). Studies have shown that individuals with periodontitis often have elevated CRP levels.[10,11]

Periodontal pathology and cardiovascular complications
The accumulation of calcium and fatty deposits in the arterial walls causes thickening and plaque formation, which causes the arteries to become stiff and rigid. This condition is known as atherosclerosis[12]. Bacteria play a key role in periodontitis and might also affect the development of artery-clogging disease[13]. Even when accounting for other risk factors, the link between periodontal disease and heart disease remains strong. Recently, the European Federation of Periodontology and the American Academy of Periodontology held a conference to discuss these connections and offer important recommendations[5]. Individuals with periodontitis who are also at risk for atherosclerotic cardiovascular disease (ACVD) because of high blood pressure, smoking, obesity and other variables, and who have not seen a doctor in the last year, ought to be referred to their physician. Comprehensive periodontal treatment plans should address modifiable lifestyle risk factors for both ACVD and periodontitis. This includes counselling on nutrition, exercise and smoking cessation.

Diabetes and periodontal infections
Hyperglycaemia, or increased blood glucose, is a defining feature of diabetes. According to recent research, both with and without diabetes may have impaired blood sugar regulation as a result of severe periodontitis. The impact of periodontitis on diabetes management is closely linked to the severity of the periodontal condition in diabetic patients.[6] Both diabetes and periodontitis are biochemically related through their involvement in chronic inflammation. The AAP/EFP workshop highlighted six key recommendations, including the need to inform patients with diabetes about their heightened risk of developing periodontitis. Patients should be informed that periodontal disease not only heightens the risk of developing additional complications, such as renal and cardiovascular disease, but also makes blood sugar management more challenging. Patients with diabetes should receive a comprehensive dental examination that includes an in-depth periodontal assessment and any required treatments.

Periodontal Status in Pregnancy Concerns
Main factor linking periodontitis with pregnancy outcomes is the significant role of inflammation during pregnancy, particularly in the later stages[16]. Similar to other inflammatory conditions, maternal periodontitis can be a source of bacteria that may enter the bloodstream and affect the fetal-maternal unit either directly or indirectly. Preterm birth, low birth weight, and pre-eclampsia are only a few of the unfavourable pregnancy outcomes that have been linked to periodontal disease. Although there is a physiological basis for the connection between periodontitis and adverse pregnancy effects, recent evaluations have rated the evidence as moderate[7]. Furthermore, while periodontal care improves dental health during pregnancy, most studies have not consistently demonstrated a significant impact on adverse pregnancy outcomes[17]. The latest AAP/EFP review emphasizes that patients should be informed that improving periodontal health contributes to overall oral health and wellness, given the current lack of conclusive evidence linking periodontitis to negative pregnancy outcomes. Pregnancy gingivitis is associated with hormonal changes that occur during pregnancy. This risk can be managed through dental hygiene education, the use of specialized tools, and regular monitoring as needed. Pregnant women can safely benefit from non-surgical periodontal therapy.

Periodontitis and other systemic health conditions have become more prevalent
A connection exists between systemic disorders and periodontitis. Various other systemic conditions, such as cancer, obesity, metabolic syndrome, rheumatoid arthritis, respiratory disorders and chronic kidney disease, have also been associated with periodontitis. The latest AAP/EFP review outlines key findings for each of these potential linkages as follows:

Chronic obstructive pulmonary condition and oral disease
Both pneumonia and Chronic Obstructive Pulmonary Disease (COPD) have been associated with periodontitis. COPD, primarily caused by cigarette smoking, is marked by increased airflow restriction and airway inflammation. Research on the link between COPD and periodontitis is still in its early stages, and there is currently no definitive evidence establishing a clear connection. Given the presence of numerous potentially pathogenic bacteria in the oral cavity, pneumonia, an infection of the airways, may be associated with

periodontitis. There hasn't been much study done on the connection between acquired lung infections and persistent periodontitis, though

Chronic renal insufficiency and periodontitis

Chronic kidney disease (CKD) is marked by kidney function below 60 mL/min per 1.73 m² for at least three months. Research indicates a possible link between periodontitis and CKD, but the exact relationship is unclear due to CKD's complex causes and its connections with diabetes and other conditions.

Periodontitis and Rheumatoid arthritis

Rheumatoid arthritis (RA) is characterized by underlying bone degeneration, concurrent articular cartilage damage and persistent synovial inflammation. Regarding cognitive decline, dementia similar to Alzheimer's disease might first manifest after initial cognitive deficits. More research is needed, as existing studies show only a weak correlation between periodontitis and cognitive impairment.

Periodontal issues and overweight

An unhealthy and excessive build-up of fat is called obesity. Research has identified a tenuous link between periodontitis and obesity. However, obesity may reflect an overall unhealthy lifestyle that increases the risk of periodontitis. The behaviours associated with this unhealthy lifestyle might be obscuring the true nature of the relationship between the two conditions.

Periodontitis and oncological conditions

The increased risk of cancer associated with chronic inflammatory diseases has led to investigations into potential links with periodontitis. Studies investigating the link between periodontitis and cancer have identified smoking and socioeconomic status as confounding factors. Ongoing long-term follow-up research is necessary to further explore this relationship.[18,19]

CONCLUSION

In the field of dentistry, research and discussion about the link between systemic diseases and periodontitis are ongoing. This knowledge is crucial for dispelling myths and providing patients with accurate, evidence-based information. While substantial evidence links certain systemic diseases, such as diabetes and atherosclerotic cardiovascular disease, with periodontitis, a definitive causal relationship between these conditions has yet to be established. While many studies highlight the need for further research, this should not deter us from actively working to enhance dental health, as it benefits overall patient well-being. The links between periodontitis and systemic diseases underscore the importance of maintaining good oral health as a component of overall health.

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