

ORIGINAL RESEARCH

Correlation between oral health and systemic diseases

Sumanpreet Kaur

BDS, India

Corresponding Author

Sumanpreet Kaur

BDS, India

Email: kaur9334@gmail.com

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ABSTRACT

Oral disease has been linked to a variety of health problems, including heart disease and diabetes.

While there have been some connections discovered between periodontitis and systemic disorders, determining direct causality remains challenging. Smoking and a poor diet are two prominent risk factors for oral and systemic disorders.

Infectious oral bacteria can cause a variety of systemic disorders, particularly in individuals with immunological and nutritional deficits, when mouth germs have systemic access. As a result, controlling existing oral infections is plainly critical and a vital precaution to avoid systemic problems. More studies are being carried out in this area.

Oral and systemic diseases are closely related; they have similar socioeconomic determinants of health and comparable modifiable risk factors. While the evidence for the former is minimal, there is strong evidence for the existence of significant connections between periodontal disease and diabetes, cardiovascular disease, and renal disease. This argument over causality vs. association has been heated.

It is commonly known that diabetes and periodontal disease are related. While well-controlled diabetes is not linked to an increased risk, poorly managed diabetes impacts both the onset and frequently fast course of periodontal disease.

Keywords- Periodontitis, Cardiovascular diseases, systemic diseases, Diabetes, Renal diseases

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INTRODUCTION

The oral cavity is the meeting point of medicine and dentistry, as well as a window into a patient's overall health. Hundreds of illnesses and drugs have an effect on the oral cavity, and pathologic disorders in the mouth have a higher systemic influence than many clinicians realise. It is uncertain if the relationship between periodontal disease and other systemic illnesses, such as atherosclerotic vascular disease, lung disease, diabetes, pregnancy-related problems, osteoporosis, and renal disease, is actual causation or just an association. Diabetes and periodontal disease have a clear bidirectional association, and there is substantial evidence that treating one illness improves the other.[1]

A shared trait of periodontal disease and these medical conditions is that they are chronic conditions that take a long time to develop and become clinically significant. Primary prevention— treating the patient prior to the onset of symptoms, myocardial infarction, stroke, diabetic complications, or significant periodontal disease—is the challenge. Complications associated with these conditions cause significant morbidity and mortality and are incredibly costly to the healthcare system. Unfortunately, a lack of access

to primary medical or dental care prevents some patients from engaging the system until a negative event has occurred. Despite the absence of clear evidence of causality and the direct impact of treatments, the consequences of these chronic conditions for the population are well understood. Dentists, family physicians, and all primary care providers must increase their collaboration and communication to maximize the benefit to patients[2] However, without good dental care, bacteria levels can rise to the point where they might cause oral illnesses such as tooth decay and gum disease.

Decongestants, antihistamines, pain relievers, diuretics, and antidepressants, for example, can all diminish saliva flow. Saliva sweeps away food and neutralises acids created by bacteria in the mouth, aiding in the protection of the body against microorganisms that reproduce and cause disease.

Oral germs and the inflammation associated with a severe type of gum disease (periodontitis), according to research, may play a role in some disorders. Furthermore, some disorders, such as diabetes and HIV/AIDS, can reduce the body's resistance to infection, exacerbating oral health issues.

Over the last two decades, dental illness has been linked to a variety of systemic diseases [1, 2], including heart disease. [3-4], atherosclerosis lesions[5], diabetes[6-7], and neurological diseases[8] are all examples of atherosclerotic lesions. [9] diabetes, Alzheimer's disease[10] stomach lesions,[11] and various malignancies [12] are also examples of cancers. [13]. Despite several suggestions as to why this association occurs, causality remains elusive [14]. It does seem obvious that subgingival inflammation is linked to the onset of diabetes and that severe periodontitis is linked to a greater prevalence of comorbidities, including cardiovascular disease, retinopathy, and renal disease, in people who already have diabetes. Therefore, it is crucial that diabetic individuals obtain the right kind of dental treatment in order to properly maintain their periodontal health. Early research suggests that treating periodontal disease may reduce haemoglobin A1c levels, which has significant implications for managing diabetes.[15]

PREVALANCE

Subgingival inflammation has been linked to the aetiology of diabetes in recent studies. This is a rapidly evolving field of study, and the data is occasionally contradictory. However, it is obvious that subgingival inflammation is connected with the development of diabetes, and severe periodontitis is associated with a greater incidence of complications such as cardiovascular disease, retinopathy, and renal disease in people who already have diabetes. This implies that it is crucial that diabetic people have adequate dental healthcare in order to control their periodontal health. Early data suggests that treating periodontal disease can reduce haemoglobin A1c levels, which has crucial implications for diabetes management.

Oral health is especially essential for those who have renal illness. What is a small illness for a healthy person may be a huge concern for someone with kidney disease because serious tooth infections can delay and even prevent patients from receiving a kidney transplant.

There is additional evidence linking oral illness, particularly periodontal disease, to Alzheimer's disease, rheumatoid arthritis, and poor pregnancy outcomes. The FDI Science Committee is carefully studying the new data for these links between oral and systemic illness since it may have substantial consequences for treatment and policy. Uncultured oral phylotypes have been found in blood samples from patients with bacteremia after dental procedures [14], ventilator-associated pneumonia, sinusitis [16], cystic fibrosis patients' sputa [17], and intrauterine infection leading to preterm birth or spontaneous abortion [18]. Nordquist and Krutchkoff [19], among others, present evidence that a severe overpopulation of one or more spirochetal species plays a significant role in periodontal disease. This discovery is based on

the observation of persistent systemic illness symptoms that are similar to those seen in other spirochetal diseases such as Lyme disease, relapsing fever, and syphilis.

DNA sequencing (and 16S RNA) analytical advances have been useful. According to Siqueira and Rôças, 40–60% of bacteria detected in both healthy and sick oral locations have yet to be cultured in vitro, phenotypically characterised, and formally designated as species [20]. As a result, the overall number of distinct oral bacteria species has more than quadrupled from 600 to 1,200.

EPIDEMIOLOGY

The evidence demonstrates that the existing level of care is insufficient to combat systemic illness. Heart attacks and strokes afflict over 1 million Americans each year; diabetes affects over 37 million Americans (1 in 10); and periodontal disease affects about half of all adults. Practitioners can use salivary tests and diagnostics to diagnose subclinical disorders. These technologies can help you deliver a higher level of care and change the course of your patients' lives.

Endodontic infections, like caries and periodontal disorders, have seen a significant increase in bacterial diversity thanks to culture-independent molecular techniques. [19] Uncultivated phylotypes accounted for roughly 55% of the species discovered in root canals of teeth with apical periodontitis, according to Sakamoto et al. [20]. Uncultivated phylotypes accounted for roughly 24–46% of the species detected in pus aspirates from acute apical abscesses [20].

SYSTEMIC DISEASES WHICH ARE LINKED WITH ORAL HEALTH

Endocarditis. This infection of the inner lining of your heart chambers or valves (endocardium) usually happens when bacteria or other germs from another part of your body, such as your mouth, move through your circulation and adhere to specific locations in your heart.

Heart disease is a kind of cardiovascular illness. Although the link is not entirely understood, some evidence shows that inflammation and infections caused by oral bacteria may be connected to heart disease, blocked arteries, and stroke. Periodontal disease is directly linked to artery inflammation. Bacteria from the mouth enters the bloodstream, causing arteries to harden, which in turn increases a patient's risk for stroke or heart attack.

Complications during pregnancy and childbirth. Premature delivery and low birth weight have been connected to periodontitis.

Pneumonia. Bacteria in your mouth can enter your lungs and cause pneumonia and other respiratory disorders.

Diabetes- Diabetes weakens the body's response to infection, putting your gums in danger. Diabetes tends to increase the frequency and severity of gum disease. Diabetes increases your patients' susceptibility to

infection, including infections of the mouth! Diabetes affects 95% of people who also have periodontal disease. Many people who have diabetes or prediabetes have never been diagnosed with either. Periodontal disease can make managing blood sugar levels more challenging, perhaps resulting in catastrophic health concerns for people with diabetes who are not appropriately treated. Every periodontal patient should be aware of their diabetes state, and vice versa! According to research, people with gum disease have a more difficult time maintaining their blood sugar levels. Diabetes management can be improved with regular periodontal treatment.

HIV/AIDS. Oral issues, such as painful mucosal sores, are frequent in HIV/AIDS patients. Osteoporosis. This bone-weakening condition is connected to tooth loss and periodontal bone loss. Certain osteoporosis medications offer a minor risk of causing jaw bone loss.

Alzheimer's disease is a neurological disorder. As Alzheimer's disease worsens, so does oral health.[10]

Inflammation in the Body-Periodontal disease is a chronic inflammatory disease that, at most stages, cannot be cured, but can be treated and managed. When the mouth and teeth are not adequately cared for, bacteria infects the tissue, creating inflammation in the mouth. Testing is available for dental professionals to help create proper treatment plans. A dental professional should have the knowledge to properly create a treatment plan to help minimize the damage Periodontal disease will play on your systemic health.

ROLE OF ORAL MICROBIOME

The normal microbiome is a steady community of microorganisms that coexist with one another and with ourselves. The makeup of the microbiome is particular to the bodily region in which it colonises; hence, the composition of the oral microbiome differs from that of the skin or the stomach. Our microbiome is critical for maintaining our health and preventing harmful bacteria and other microbes from colonising us. When this fails, a pathogenic change in the oral microbiota known as dysbiosis may occur. Porphyromonasgingivalis, a keystone periodontal infection, is substantially involved in this transition. As a result, a variety of inflammatory substances are produced, which modify the local disease process. These factors may potentially reach the bloodstream and cause sickness in remote locations.

ORAL SYSTEMIC TREATMENT OPTIONS

Periodontal disease treatment includes identifying pathogenic organisms, eliminating them, and repopulating the crevicular microbiome. Many oral infections have been shown to penetrate and incubate within gingival sulcus epithelial cells [3]. As a result, vaporising these internal bacteria and gingival sulcular microorganisms using a micro-beam-tipped CO2 laser is an effective way of eliminating them.

Then, to avoid reinfection, oral hygiene techniques should be utilised. After sterilising the sick gingival sulcus, the remaining issue is rebalancing the microorganisms. Today, the vital reestablishment of normal flora is at the forefront of research. According to personal experiences from various practitioners, ozone in a number of forms has also been used successfully. However, there do not appear to be many official research articles published on this modality as of yet. [11]

Endodontic lesions: Endodontic therapy is usually provided by dentists when significant decay occurs in the death of a tooth with necrotic pulp. Endodontic therapy is used to remove and clean the centrally affected area of the tooth's nerve chamber and major canals. Dentists are well aware that Root Canal Therapy (RCT) does not adequately eliminate all infections associated with necrotic teeth. Within the dentin of a tooth, there are thousands of dentinal tubules, each of which has a pain-sensitive mechanism that innervates the tooth's interior [21]. When a tooth dies, these tubules operate as nutrient-rich crannies for bacteria colonisation and gather necrotic materials that are unlikely to be eliminated by typical endodontics. As a result, extraction is the most predictable and dependable method.

CONCLUSION

Both the medical and dental professions strive to improve their patients' health. The major conditions that affect a large percentage of the population and have been well studied for their relationship to oral health are atherosclerotic vascular disease, pulmonary disease, diabetes, and pregnancy-related complications, but it is probably safe to assume that there are other conditions that have some degree of association. Although numerous studies on the treatment of oral illnesses have not found a statistically significant influence on these systemic disorders, neither profession would argue that improving a patient's health is beneficial. Primary disease prevention is the ideal technique, although it is often difficult to implement. Primary care physicians and dentists must improve their teamwork and communication.[22]

Oral health is more than simply a pretty smile; it is a sign of your entire health. This is why your dentist will always advise you to practise good oral hygiene, such as brushing your teeth twice a day and going to the dentist for regular cleanings and check-ups. Your dentist will advise you on how to enhance your oral hygiene based on the findings of your oral examination and an expert's opinion. Good dental hygiene is essential for avoiding or reducing the course of oral illnesses, including caries and periodontitis. This will also help to lower the quantity of germs in your mouth and prevent bacteria from spreading to other regions of your body.

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