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Original Research

A retrospective analysis of the relationship between periodontal disease and systemic health outcomes

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ABSTRACT:

Background: Gingivitis and periodontitis collectively refer to periodontal disease, which is a common oral health issue that may have systemic effects. Comprehensive patient treatment requires an understanding of the connection between systemic health outcomes and periodontal disease. **Techniques:** Ten years (2010-2020) of electronic health data from a tertiary care center's Dental Clinic were examined. Eight hundred individuals with verified cases of periodontal disease based on radiographic and clinical evaluations made up the research population. Extracted and analyzed data included periodontal status, systemic health outcomes (e.g., diabetes mellitus, respiratory illnesses, cardiovascular disease), and demographic factors (e.g., age, gender, smoking status). **Findings:** Of the participants in the study, thirty percent had severe periodontitis and sixty-five percent had periodontal disease. There have been notable correlations found between systemic health outcomes and periodontal disease, such as respiratory illnesses (10%), diabetes mellitus (15%), and cardiovascular disease (25%). In summary, this retrospective investigation demonstrates the strong correlation between periodontal disease and poor outcomes for systemic health. In order to prevent and manage disease, integrated approaches to oral and systemic healthcare are crucial, highlighting the necessity of cooperation between dental and medical specialists.

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INTRODUCTION

Gingivitis and periodontitis together constitute periodontal disease, which is a major global public health problem. If treatment is not received, it will result in the loss of teeth due to inflammation and destruction of the tooth's supporting components. Recent studies have shown the complex connection between periodontal disease and systemic health consequences, extending beyond its effects on oral health. According to this reciprocal relationship, systemic disorders can affect the development and severity of periodontal disease, and periodontal

disease can also influence the etiology and progression of numerous systemic ailments [1-3].

The systemic spread of inflammatory mediators and periodontal pathogens, which can set off immune responses and systemic inflammation, is the fundamental cause of the connection between systemic health and periodontal disease. Epidemiological research has repeatedly shown links between periodontal disease and illnesses such as diabetes mellitus, respiratory problems, cardiovascular disease, and unfavorable pregnancy outcomes. Furthermore, there is a reciprocal relationship between oral and systemic health due to

common risk factors such as genetic susceptibility, obesity, and smoking [4-6].

There are still gaps in our understanding of the underlying processes and therapeutic consequences of this link, despite the association's increasing acknowledgment. In order to develop integrated approaches to oral and systemic healthcare, further research is necessary to clarify how periodontal disease affects systemic health and vice versa. By utilizing electronic health data to examine the relationship between periodontal disease and systemic health outcomes, this retrospective investigation aims to add to the body of knowledge. [7]

MATERIALS AND METHODS

Ten years (2010–2020) of electronic health records from the Dental Clinic of a tertiary care facility were examined in this retrospective research. 665 individuals with verified cases of periodontal disease based on radiographic and clinical evaluations made up the research population. We extracted and examined data on demographic traits, medical history, periodontal state, and systemic health outcomes. The severity of periodontal disease was categorized using predetermined criteria, and outcomes related to systemic health included respiratory illnesses, diabetes mellitus, and cardiovascular disease. SPSS version 21 was used for the statistical analysis, with a

significance level of $p < 0.05$. The institutional review board granted ethical approval. Throughout the research procedure, patient confidentiality and data privacy were guaranteed. This approach made it possible to thoroughly examine, in a real-world clinical context, the connection between systemic health outcomes and periodontal disease.

RESULTS

The patients' mean age was 45.2 years (± 10.3 SD), and there were somewhat more females (55%) than men (45%). Thirty percent of the patients were smokers, while the other seventy percent did not smoke. The majority of patients (77.5%) had periodontitis, with 30% having severe periodontitis, according to the periodontal status classification. Only a lower percentage (22.5%) had gingivitis upon presentation. Table 1 shows that, with a significant p-value of less than 0.001, 25% of patients with periodontal disease also had cardiovascular illness. Similarly, diabetes mellitus was identified in 15% of individuals; a p-value of 0.003 indicated statistical significance. Furthermore, respiratory issues were reported by 10% of patients (p -value = 0.012). These results underscore the potential influence of dental health on general well-being by pointing to a noteworthy correlation between systemic health outcomes and periodontal disease. Table Two

Table 1: Demographic Characteristics and Periodontal Status of the research Population

Characteristic	Mean \pm SD / Frequency (%)
Age (years)	45.2 \pm 10.3
Gender	
- Male	300 (45%)
- Female	365 (55%)
Smoking status	
- Smoker	200 (30%)
- Non-smoker	465 (70%)
Periodontal status	
- Gingivitis	150 (22.5%)
- Periodontitis	515 (77.5%)
- Severe periodontitis	200 (30%)

Table 2: Incidence of Systemic Health Outcomes Among Patients with Periodontal Disease

Systemic Health Outcome	Incidence (%)	p-value
Cardiovascular Disease	25	<0.001
Diabetes Mellitus	15	0.003
Respiratory Disorders	10	0.012

DISCUSSION

This retrospective analysis's findings shed important light on the connection between systemic health outcomes and periodontal disease. The findings highlight the noteworthy correlations found between periodontal disease and unfavorable systemic illnesses, such as respiratory disorders, diabetes mellitus, and cardiovascular disease.

Cardiovascular Disease (CVD): A large body of research has been done and the connection between

periodontal disease and CVD is well accepted in the literature. According to the current data, there was a significant prevalence of CVD among the research population, with 25% of individuals diagnosed with periodontal disease also having the condition. This result is in line with other epidemiological studies that showed those with periodontal disease had an increased risk of CVD [1]. The development, progression, and future cardiovascular events of atherosclerosis may be facilitated by endothelial

dysfunction and systemic inflammation, which are the processes underpinning this connection [2]. Furthermore, the formation of atheromatous plaques has been linked to periodontal infections such as *Porphyromonas gingivalis*, supporting the connection between dental and cardiovascular health [3].

Diabetes Mellitus: Periodontal disease and diabetes mellitus have a reciprocal relationship in which the start and course of each ailment influences the other. 15% of patients with diabetes mellitus were also diagnosed with periodontal disease in the current investigation, indicating a considerable co-occurrence. This result is consistent with other studies showing that people with diabetes mellitus have higher rates and severity of periodontal disease [4]. Insulin resistance, systemic inflammation, and compromised immune response are the underlying processes that connect these two diseases and aggravate their oral and systemic presentations, respectively [5]. Significantly, it has been demonstrated that treating periodontal disease effectively enhances glycemic control in people with diabetes mellitus, highlighting the potential contribution of periodontal treatment to diabetes management [6,7].

Respiratory Disorders: In recent years, there has been an increased awareness of the link between periodontal disease and respiratory conditions such as pneumonia and "chronic obstructive pulmonary disease (COPD)". According to a recent investigation, respiratory problems were found in 10% of individuals with periodontal disease, suggesting a possible connection between respiratory and dental health. Emerging research indicates that pulmonary inflammation and infection may be influenced by inflammatory mediators and periodontal pathogens [8]. In addition, risk factors for periodontal disease such as smoking and weakened immune systems aggravate respiratory issues even more [9,10]. Therefore, treating periodontal disease with the right dental procedures may have an impact on the state of lung health.

Clinical Implications: The necessity of integrated dental and medical treatment approaches is highlighted by the considerable connections between systemic health outcomes and periodontal disease. Dental experts are essential in detecting and treating periodontal disease, as it reduces the risk of harmful systemic illnesses and maintains oral health. Periodontal disease and its possible systemic ramifications should be evaluated during routine dental checkups, especially in individuals who have established risk factors like diabetes mellitus and cardiovascular disease. Moreover, complete patient care necessitates cooperation between dental and medical professionals in order to enable early identification, intervention, and management of both systemic and oral health issues.

Restrictions and Upcoming Courses: The results of this retrospective investigation should be interpreted with a number of limitations in mind. First off, the

results' generalizability may be impacted by selection bias and data flaws brought about by the dependence on electronic health records. Furthermore, the research's retrospective design makes it impossible to demonstrate causal links between systemic health outcomes and periodontal disease. It is necessary to conduct prospective longitudinal investigations to clarify the temporal order and underlying processes of this association. Future studies should also examine how well periodontal treatments work to enhance systemic health outcomes and contribute to the development of evidence-based therapeutic guidelines.

CONCLUSION

In summary, this retrospective investigation adds to the body of data supporting the link between periodontal disease and poor systemic health outcomes, such as respiratory illnesses, diabetes mellitus, and cardiovascular disease. The results emphasize the significance of dental health for general health and draw attention to the possible benefits of periodontal treatment in reducing risks to systemic health. In order to prevent and manage disease, integrated approaches to oral and systemic healthcare are crucial, highlighting the necessity of cooperation between dental and medical specialists.

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