Prevalence of systemic risk factors in chronic periodontitis patients at Haji regional public hospital in East Java Province: a cross-sectional study

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ABSTRACT

Introduction: Periodontal disease is a chronic inflammatory disease that affects the tooth-supporting tissues and is often associated with various systemic disorders. Understanding this relationship is essential for comprehensive dental management. The aim of this study was to determine the prevalence of systemic risk factors among patients with chronic periodontitis at Haji Regional Public Hospital, East Java Province. **Methods:** A descriptive observational study with a cross-sectional design involving 108 patients diagnosed with chronic periodontitis. Data were collected from electronic medical records and analyzed descriptively using cross-tabulation. **Results:** The majority of patients were older adults (51.9%) and female (59.3%). A total of 78.7% had systemic conditions, the most common being hypertension and diabetes mellitus. **Conclusion:** Most chronic periodontitis patients had systemic conditions, particularly among older adults. These findings emphasize the importance of an interdisciplinary approach in periodontal care.

Keywords

Chronic periodontitis, systemic condition, prevalence, Indonesia

Prevalensi faktor risiko sistemik pada pasien periodontitis kronis di Rumah Sakit Umum Daerah Haji Provinsi Jawa Timur: Studi cross sectional

ABSTRAK

Pendahuluan: *Penyakit periodontal merupakan penyakit inflamasi kronis yang memengaruhi jaringan penyangga gigi dan sering kali berhubungan dengan berbagai gangguan sistemik. Memahami hubungan ini sangat penting untuk penatalaksanaan kedokteran gigi yang komprehensif. Penelitian ini bertujuan untuk mengetahui prevalensi faktor risiko sistemik pada pasien dengan periodontitis kronis di Rumah sakit Umum Daerah Haji Provinsi Jawa Timur.* ***Metode:*** *Penelitian observasional deskriptif dengan desain potong lintang yang melibatkan 108 pasien yang didiagnosis dengan periodontitis kronis. Data dikumpulkan dari dokumentasi medis elektronik dan dianalisis secara deskriptif menggunakan tabel krostab.* ***Hasil:*** *Mayoritas pasien berusia lanjut (51,9%) dan berjenis kelamin perempuan (59,3%). Sebanyak 78,7% memiliki kondisi sistemik, yang paling umum adalah hipertensi dan diabetes melitus.* ***Simpulan:*** *Sebagian besar pasien dengan periodontitis kronis memiliki kondisi sistemik, terutama pada kelompok usia lanjut. Temuan ini menekankan pentingnya pendekatan interdisipliner dalam perawatan periodontal.*

Kata kunci

Periodontitis kronis, kondisi sistemik, prevalensi, Indonesia

INTRODUCTION

Periodontal disease is a chronic inflammatory condition that affects the tissues supporting the teeth, resulting from a complex interaction between the human immune response and microbial biofilm.[1-3] Chronic periodontitis typically progresses slowly and often without early symptoms, leading many patients to remain unaware of the disease until significant attachment loss or tooth mobility develops.[4,5] In Indonesia, the prevalence of periodontal disease remains high. The National Basic Health Research (Riskesdas) revealed that 74.1 percent of the population experiences periodontal tissue problems.[6]

Previous studies have established a bidirectional relationship between diabetes mellitus with periodontitis.[7] Other systemic conditions, such as hypertension, cardiovascular disorders, and chronic renal disease, can exacerbate periodontal conditions through increased systemic inflammation and immune dysregulation. Conversely, periodontitis may contribute to systemic disease progression by releasing inflammatory mediators and bacteria into the bloodstream.[8-11]

Moreover, integrating systemic health screening into periodontal care has been shown to improve outcomes by enabling early detection of comorbidities and supporting holistic, patient-centered management.[12,13] Collaborative approaches between dental and medical professionals are increasingly recommended to address shared risk factors and reduce the burden of chronic diseases.[14] Such strategies require robust local epidemiological data to inform clinical practice and health policy.[15]

Understanding the prevalence of systemic risk factors among periodontitis patients is essential for accurate diagnosis, effective management, and personalized treatment planning. However, local data regarding the distribution of systemic comorbidities in periodontitis patients treated in referral healthcare centers remain limited. This research aims to evaluate the demographic characteristics and prevalence of systemic conditions among patients with chronic periodontitis at Haji Regional Public Hospital (RSUD Haji), East Java Province, in 2024. The novelty of this research lies in providing the first locally sourced, hospital-based epidemiological data.

The relationship between chronic periodontitis and systemic diseases such as diabetes, hypertension, cardiovascular disease, and chronic kidney disease is well established internationally, but data on this association in Indonesian referral hospitals remain limited. Given Indonesia's high periodontal disease prevalence (74.1%), understanding the distribution of systemic risk factors in these patients is crucial for improving diagnosis, personalizing treatment, enabling interdisciplinary care, and guiding public health strategies. This study addresses that regional data gap and supports evidence-based integration of systemic health evaluations in periodontal care. The aim of this study is to determine the prevalence of systemic risk factors among patients with chronic periodontitis at Haji Regional Public Hospital in East Java Province.

METHODS

This descriptive, observational study employed a retrospective cross-sectional design. It was conducted at the Department of Periodontology, Haji Regional Public Hospital (RSUD Haji), East Java Province, throughout the year 2024. The study included a single group of patients diagnosed with chronic periodontitis, with subgroup analyses performed based on age, gender, and systemic disease status. Source and methods of participant selection: All eligible patients diagnosed with chronic periodontitis during the study period were identified through the hospital's electronic medical record system. A total sampling method was used, where all qualifying records were included without random sampling or matching. The total number of patients with chronic periodontitis who had systemic risk factors in 2024 was 108.

As this was a total population study, no minimum sample size calculation was required.

Inclusion criteria were patients aged ≥ 13 years diagnosed with chronic periodontitis according to the ICD-10 classification and recorded in electronic medical records of patients who attended the Department of Periodontology at RSUD Haji during 2024. Exclusion criteria were patients with missing or incomplete medical record data related to systemic health conditions, age, or gender. Diagnostic criteria for chronic periodontitis: Diagnosis was based on clinical periodontal assessments recorded in the patient's medical records in accordance with the ICD-10 classification (K05.3), including documented periodontal pocket depth ≥ 4 mm and clinical attachment loss ≥ 1 mm, as recorded by periodontists at RSUD Haji. All eligible records were included to allow the analysis to reflect the entire population of chronic periodontitis patients treated at the department in 2024, minimizing sampling bias. Data were analyzed descriptively using IBM SPSS Statistics version 29 (2023).

RESULTS

This study involved 108 patients diagnosed with chronic periodontitis who attended the Department of Periodontology, RSUD Haji, East Java Province during the year 2024. The characteristics of the participants, including age group distribution, gender, and systemic health status are summarized in Table 1 and Figure 1. The results showed that of the 108 patients, the majority were elderly, (51,9%), female (59,3%), and had systemic disease (78,7%).

Table 1. Distribution of age group, gender, and systemic health status among chronic periodontitis patients at RSUD Haji, East Java Province

Variable	Category	Frequency (n)	Percentage(%)
Age group	Teenagers (13–18 years)	1	0.9%
	Adults (19–59 years)	51	47.2%
	Elderly (>59 years)	56	51.9%
Gender	Male	44	40.7%
	Female	64	59.3%
Systemic status	Without systemic disorders	23	21.3%
	With systemic disorders	85	78.7%

Figure. 1. Prevalence of age, gender, and systemic health status among chronic periodontitis patients at RSUD Haji, East Java Province

The majority of patients (78.7%) had systemic disorders. Cardiovascular disorders were the most common, affecting 38 patients, followed by metabolic disorders (19 patients), cerebrovascular disorders (4 patients), lung disorders, HIV/AIDS, and kidney disorders (2 patients each), and blood disorders (1 patient). Seventeen patients had multiple systemic disorders, most commonly combinations of cardiovascular, cerebrovascular, endocrine, or bone metabolic disorders. Systemic diseases were classified according to ICD-10 classification.

The most common systemic diagnoses accompanying chronic periodontitis were ICD-10 E11 (Type 2 Diabetes Mellitus) and ICD-10 I10 (Hypertension). Additional diagnoses included ICD-10 I11.9 (Hypertensive Heart Disease, unspecified) (Table 2 and Figure 2).

Table 2. Distribution of systemic conditions among chronic periodontitis patients based on ICD-10 classification

No	Systemic Disorder	ICD-10 Code	Frequency (n)
1	HIV disease resulting in other infectious diseases	B20.4	2
2	Type 1 Diabetes Mellitus	E10	1
3	Type 2 Diabetes Mellitus	E11	18
4	Epilepsy, unspecified	G40.9	1
5	Polyneuropathy in diseases classified elsewhere	G63.2	1
6	Essential (primary) Hypertension	I10	17
7	Hypertensive Heart Disease, unspecified	I11.9	16
8	Other Forms of Angina Pectoris	I20.8	4
9	Atherosclerotic Heart Disease	I25.1	1
10	Stroke	I61, I63	2
11	Asthma, unspecified	J45	2
12	Thrombocytopenia	D69.6	1
13	Chronic Kidney Disease, Stage 5	N18.5	2
14	Multiple systemic conditions (≥2 diagnoses)	--	17
15	Without systemic diseases	--	23
	Total		**108**

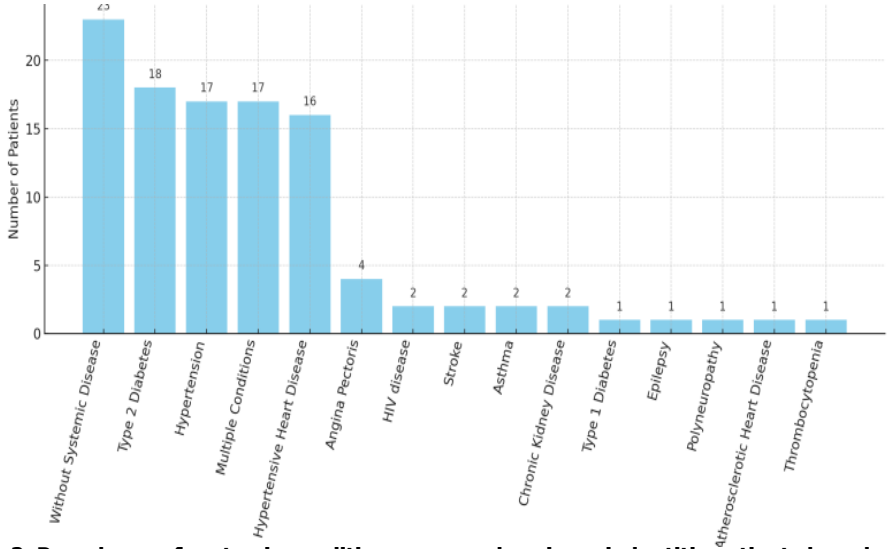

Figure 2. Prevalence of systemic conditions among chronic periodontitis patients based on ICD-10 classification

DISCUSSION

The results showed that most patients were elderly, female, and had one or more systemic disorders (Table 1). This finding is consistent with previous studies describing a relationship between systemic health status and periodontitis progression.[8,12] The predominance of elderly patients aligns with global evidence showing that periodontitis prevalence increases with age.[1] Older individuals tend to have reduced immune response and longer exposure to plaque and calculus, increasing the risk of periodontal tissue damage.[11]

The higher proportion of female patients (59.3%) may reflect a greater tendency among women to seek dental care (Table 1). However, this contrasts with other studies reporting that men tend to have greater periodontitis severity, partly due to higher smoking rates and

poorer oral hygiene.[8] Moreover, men with low levels of bioavailable testosterone, influenced by sex hormone binding globulin, have an increased risk of periodontitis.[16]

The finding that 85 patients had systemic disorders supports earlier research describing a bidirectional relationship between periodontitis and systemic diseases.[17] The most common vascular disorder was hypertension. Hypertension increases inflammatory mediators and causes vascular dysregulation, both of which contribute to periodontal damage.[10] Periodontitis can also promote atherosclerosis through pathogens such as *Porphyromonas gingivalis,* which trigger endothelial dysfunction and plaque formation.[3,5]

The most common endocrine disorder was diabetes mellitus, affecting 20 patients. Diabetes mellitus, particularly type 2, is the metabolic disorder most strongly associated with periodontal disease. Chronic hyperglycemia induces oxidative stress and pro-inflammatory cytokines such as IL-1β, TNF-α, and IL-6, and also disrupts microcirculation in gingival tissue, all of which increase the risk of periodontal disease. Conversely, periodontitis can worsen glycemic control by reducing insulin sensitivity.[7,18,19]

This study also identified patients with a history of stroke (Table 2), consistent with reports indicating that stroke risk increases by 2.55 times in severe periodontitis and by 1.71 times in moderate periodontitis compared to individuals without periodontitis.[8] Additionally, a patient with Parkinson's disease was recorded, consistent with studies suggesting that periodontitis may contribute to neuroinflammation associated with dementia.[20,21] Four patients had a history of radiotherapy or chemotherapy, conditions that can promote systemic osteoporosis and accelerate alveolar bone resorption. Osteoporosis may exacerbate periodontal tissue damage in the presence of infection and inflammation.[6,11]

In this study, two patients had asthma (Table 2) Asthma is characterized by chronic inflammation and shared cytokine pathways like interleukin IL-6 and TNF-α, which can worsen both asthma and periodontitis. Epidemiological studies have shown that periodontitis is more common in individuals with asthma, with its severity correlating with asthma duration and control status.[22] Periodontitis and reduced salivary flow are more prevalent in patients with severe asthma compared to mild to moderate asthma or no asthma.[23]

One patient had thrombocytopenia. Persistent periodontal infection can elevate systemic inflammation and potentially worsen hematological disorders through pro-inflammatory cytokines and microbial invasion into the bloodstream.[24] Patients with chronic kidney disease (CKD) were also identified, consistent with studies showing a strong association between periodontitis and CKD stage progression. Among hemodialysis patients, the prevalence of periodontitis exceeds 50%.[9]

Two patients with HIV/AIDS were recorded, highlighting the vulnerability of immunosuppressed individuals to opportunistic infections such as periodontitis. The prevalence of periodontitis is higher among individuals with HIV.[25] Opportunistic infections, dysbiosis, and inflammation can perpetuate the periodontal disease cycle.[24]

Although no statistically significant associations were found, these patterns offer valuable insights for clinical strategies and prevention policies (Table 2). The lack of significance may reflect the limited sample size or the complex multifactorial nature of periodontal–systemic interactions. An interdisciplinary approach is essential, particularly for elderly patients and those with comorbidities. Given the growing burden of non-communicable diseases in Indonesia, these findings underscore the need for comprehensive systemic screening in dental care. Comorbidity-based risk assessment and detailed medical histories are critical for effective periodontal treatment planning. Moreover, patients with multiple systemic conditions require especially careful management.

This study has certain limitations, notably its cross-sectional design that hinders causal conclusions, and the absence of clinical data such as periodontitis severity. Future studies with prospective designs, more diverse samples and biomarker analyses are recommended to explore causal links between systemic diseases and periodontal conditions.

Overall, the integration of microbiological, immunological, hormonal, and systemic components in this discussion reflects the multifactorial nature of periodontitis. The present

findings reinforce the importance of early identification of systemic risk factors and targeted periodontal therapy, especially in medically compromised patients. Future research should focus on precision approaches that address microbial dysbiosis, host immune modulation, and systemic inflammatory load simultaneously, as suggested in recent conceptual frameworks.[27-30]

CONCLUSION

The majority of chronic periodontitis patients at RSUD Haji, East Java Province in 2024 had systemic conditions, predominantly among elderly and female patients. These findings underscore the importance of integrating systemic screening into comprehensive periodontal care. Integrating systemic health evaluation into dental protocols is strongly recommended to support holistic patient care. Strengthening collaboration between dental and medical services, implementing comorbidity-based risk assessment, and incorporating detailed medical histories into clinical protocols may enhance patient management and reduce the burden of periodontal–systemic complications. The implication of this study may also provide an evidence-based foundation for hospital policy development and public health planning aimed at improving holistic oral-systemic healthcare.

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