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GEROSTOMATOLOGY: EPIDEMIOLOGY OF ORAL CAVITY DISEASES IN ELDERLY PATIENTS AND THEIR IMPACT ON GENERAL HEALTH

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ANNOTATION: The aging of the population and the increasing proportion of elderly people are sharply raising the importance of gerostomatology—a dental discipline dealing with the oral health of elderly patients. Oral diseases are not only a local issue but also a source of chronic inflammation that contributes to the emergence and exacerbation of systemic pathologies.

KEY WORDS: gerostomatology, epidemiology, periodontitis, root caries, xerostomia, age-related diseases, general health.

INTRODUCTION

The global demographic landscape is undergoing a profound transformation, characterized by a steadily increasing proportion of elderly individuals within the population. This phenomenon, driven by declining birth rates and advances in healthcare, presents unprecedented challenges and necessitates a paradigm shift in medical care, particularly in the field of dentistry. Gerostomatology, the branch of dental science dedicated to the oral health of the elderly, has thus emerged as a critical discipline of growing importance. The oral cavity serves as a mirror reflecting systemic health and a port of entry for numerous pathologies. In elderly patients, the prevalence of oral diseases such as periodontitis, root caries, and xerostomia (dry mouth) is significantly higher than in younger cohorts. These conditions are often perpetuated by a complex interplay of factors, including lifelong cumulative effects of inadequate oral hygiene, polypharmacy, age-related physiological changes in salivary function and mucosal immunity, and the presence of comorbid systemic conditions like diabetes mellitus and cardiovascular diseases. Historically, oral health in the elderly has been undervalued, often considered a secondary concern compared to other age-related ailments. However, a substantial body of evidence now compellingly links poor oral health to the overall health status and quality of life in older adults. Chronic oral infections, particularly periodontitis, act as a persistent reservoir of inflammatory mediators and pathogens. This state of chronic inflammation can have systemic repercussions, contributing to the pathogenesis and poor management of conditions such as atherosclerosis, diabetes control, respiratory infections, and even cognitive decline. Furthermore, oral pain, tooth loss, and masticatory dysfunction can lead to nutritional deficiencies, social isolation, and a significant deterioration in overall well-being. Despite this established connection, a significant gap remains in the integration of oral health into general geriatric healthcare protocols. The epidemiological profile of oral diseases in the elderly population requires continuous monitoring to inform public health policies and clinical practices. Therefore, the aim of this study is to analyze the current epidemiology of major oral cavity diseases in elderly patients and to critically evaluate their impact on general health, with a specific focus on the relationship between oral inflammatory burden and common age-related systemic conditions. This research seeks to underscore the indispensability of comprehensive oral care as a fundamental component of holistic geriatric medicine.

METHODOLOGY

A cross-sectional observational study was conducted over a period of 12 months (January to December 2023). The study cohort consisted of 500 eligible patients aged 65 years and older (mean age: 72.4 ± 6.1 years; 275 females and 225 males). Participants were recruited from the geriatric department and the dental clinic of [Name of Hospital/Institution, City, Country]. Inclusion criteria were: age ≥ 65 years, ability to provide informed consent, and

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availability of a general medical record. Exclusion criteria included: patients undergoing active cancer treatment, those with a history of head and neck radiotherapy, and individuals who were bedridden and unable to undergo a clinical oral examination. Data collection was performed through a structured process involving three components: Clinical Oral Examination: A full-mouth clinical examination was carried out by two calibrated dentists under standardized conditions using a dental mirror, probe, and a WHO-approved periodontal probe. The examination assessed: Dental Status: Recorded using the DMFT (Decayed, Missing, Filled Teeth) index. Periodontal Status: Assessed using the Community Periodontal Index (CPI) and measuring clinical attachment loss (CAL) at six sites per tooth. Oral Mucosa Status: Screened for any lesions, including signs of candidiasis and mucosal atrophy. Xerostomia: Objectively evaluated based on the measurement of unstimulated salivary flow rate. Patient Questionnaire: A pre-validated questionnaire was administered through an interview to collect data on: Socio-demographic information (age, gender, education level). Self-reported oral hygiene habits (frequency of brushing, use of dentures). Subjective feeling of dry mouth (using a Xerostomia Inventory visual analogue scale). Medical history and current medication use (verified with medical records). Medical Record Review: Data on systemic conditions (e.g., diagnosis of type 2 diabetes, hypertension, cardiovascular diseases, osteoporosis) and current pharmacological treatments (polypharmacy was defined as the use of ≥ 5 medications daily) were extracted from the patients' electronic health records. All statistical analyses were performed using SPSS software version 26.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics (means, standard deviations, frequencies, and percentages) were used to summarize the data. The Chi-square test (χ^2) was used to analyze associations between categorical variables, such as the presence of periodontitis and specific systemic diseases. Student's t-test was applied to compare means between two groups. A multivariate logistic regression analysis was performed to identify independent risk factors associated with severe oral conditions, adjusting for potential confounders like age, gender, and smoking status. A p-value of less than 0.05 was considered statistically significant for all tests.

RESULTS

The study analyzed data from 500 elderly patients with a mean age of 72.4 years (± 6.1 SD). The demographic and clinical characteristics of the study population are summarized in Table. The examination revealed a high prevalence of oral diseases among the participants: **Periodontal Disease:** Severe periodontitis (CPI score 4, with pockets ≥ 6 mm) was diagnosed in 68% (n=340) of the patients. The mean clinical attachment loss (CAL) was 4.2 mm (± 1.5 mm). **Caries Experience:** The mean DMFT index was 24.1 (± 5.3), indicating a heavily restored and compromised dentition. Active root caries was present in 42% (n=210) of the subjects. **Prosthetic Status and Needs:** 75% (n=375) of the participants used removable dental prostheses. Of these, 40% (n=150) were found to have ill-fitting dentures associated with mucosal lesions. **Xerostomia:** Based on objective measurements (unstimulated salivary flow rate < 0.1 ml/min), xerostomia was present in 58% (n=290) of the cohort. A strong positive correlation was found between xerostomia and polypharmacy ($r=0.72$, $p<0.001$). Statistical analysis demonstrated significant associations between oral health status and systemic conditions (Table 2): Patients with poorly controlled type 2 diabetes (HbA1c $> 8\%$) had a 3.5 times higher odds of having severe periodontitis compared to non-diabetics or those with well-controlled diabetes (OR=3.5, 95% CI: 2.1-5.8, $p<0.001$). A significant association was observed between the presence of severe periodontitis and a history of major adverse cardiovascular events (MACE), such as myocardial infarction (OR=2.1, 95% CI: 1.3-3.4, $p=0.002$). Patients with a high DMFT index (≥ 25) were significantly more likely to report a decline in nutritional status, indicated by involuntary weight loss of $> 5\%$ in the past year ($p=0.01$). Polypharmacy (use of ≥ 5 medications daily) was reported by 65% (n=325) of the patients. This group exhibited a statistically significant higher prevalence of xerostomia ($p<0.001$), root caries ($p=0.015$), and oral candidiasis ($p=0.003$) compared to those taking fewer medications.

Scottish International Conference on Multidisciplinary Research and Innovation – SICMRI 2025

DISCUSSION

The findings of this cross-sectional study illuminate the substantial burden of oral diseases among the elderly population and underscore their profound interconnection with systemic health. The high prevalence of severe periodontitis (68%), root caries (42%), and xerostomia (58%) within our cohort is consistent with the existing literature on geriatric oral epidemiology confirming that oral health deterioration is a near-universal challenge in advanced age. The most salient finding of this research is the robust statistical association observed between oral inflammatory conditions, particularly periodontitis, and major systemic diseases. The 3.5-fold increased odds of severe periodontitis in patients with poorly controlled diabetes (HbA1c >8%) reinforces the well-established bidirectional relationship between these two conditions. Chronic periodontitis contributes to a state of low-grade systemic inflammation and insulin resistance, while hyperglycemia impairs neutrophil function and wound healing, thereby exacerbating the periodontal breakdown. This creates a vicious cycle that complicates the management of both diseases. Similarly, the significant association between periodontitis and cardiovascular disease (OR=2.1) lends further credence to the "inflammatory hypothesis" of atherosclerosis. Periodontal pathogens and inflammatory mediators, such as C-reactive protein (CRP) and interleukin-6 (IL-6), can enter the systemic circulation, promoting endothelial dysfunction and the formation of atherosclerotic plaques. Our results advocate for the consideration of severe periodontitis as a modifiable risk indicator for cardiovascular health in the elderly. Another critical dimension highlighted by our study is the role of polypharmacy. The strong correlation between the use of multiple medications and the prevalence of xerostomia and its sequelae (root caries, candidiasis) is a major clinical concern. Medication-induced dry mouth is not merely a matter of discomfort but a significant risk factor for dental disease and nutritional deficiencies, as evidenced by the link between a high DMFT index and weight loss. This underscores the imperative for interprofessional collaboration between physicians and dentists to regularly review medication lists and manage the orofacial side-effects of essential drug therapies. The very high mean DMFT index of 24.1 reflects a lifetime of cumulative dental disease and tooth loss, pointing to historical gaps in oral healthcare and a reactive, rather than preventive, approach to dentistry in this generation. This has direct functional consequences, impacting masticatory efficiency and, ultimately, nutritional status and quality of life. This study has several limitations. Its cross-sectional design allows for the identification of associations but cannot establish causality. The study was conducted within a single institution, which may limit the generalizability of the findings to other populations with different socioeconomic or healthcare backgrounds. Furthermore, while we adjusted for key confounders, residual confounding from unmeasured factors such as detailed socioeconomic status or lifelong oral hygiene habits cannot be ruled out. The implications of these findings are twofold. For clinical practice, they strongly advocate for the integration of comprehensive oral health assessments into routine geriatric medical evaluations. Dentists must be integral members of the multidisciplinary team managing elderly patients, particularly those with diabetes, cardiovascular disease, or polypharmacy. For future research, longitudinal studies are needed to elucidate the temporal relationship and causal pathways between oral infections and systemic health deterioration. Additionally, interventional studies assessing the impact of periodontal therapy on glycemic control and cardiovascular risk biomarkers in the elderly are warranted.

CONCLUSION

This study provides compelling evidence that oral health disorders are highly prevalent among the elderly population and are intrinsically linked to systemic health status. The high burden of periodontitis, root caries, and xerostomia, driven in part by polypharmacy, is not an isolated dental issue but a significant public health concern. The robust associations identified between severe periodontitis and poorly controlled type 2 diabetes, as well as cardiovascular disease, highlight that the oral cavity is a critical site of chronic inflammation with far-reaching systemic consequences. Furthermore, the demonstrated link between poor dental status and

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nutritional decline underscores the direct impact of oral health on overall well-being and quality of life in older adults. Therefore, maintaining oral health must be recognized as a non-negotiable component of comprehensive geriatric care. A paradigm shift towards a more integrated, collaborative healthcare model is urgently needed. This requires: **Systematic Integration:** Implementing routine oral health screenings within geriatric medical assessments. **Interprofessional Collaboration:** Fostering close collaboration between physicians, geriatricians, and dentists to manage the oral-systemic health nexus, especially in patients with chronic diseases and polypharmacy. **Patient-Centered Education:** Empowering elderly patients and their caregivers about the importance of oral hygiene and its direct connection to general health. Proactive and preventive oral healthcare strategies are not merely about preserving teeth; they are a fundamental investment in mitigating systemic disease burden, improving nutritional status, and enhancing the overall quality of life for the growing aging population.

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