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THE VITAL ROLE OF PERIODONTAL HEALTH IN DIABETES MANAGEMENT

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Suzana Carolina Ramos Silva

ABSTRACT

The analysis underscores the critical importance of periodontal health in managing diabetes mellitus, a chronic condition affecting millions globally. It highlights the intrinsic link between oral health and glycemic control, along with the complications associated with diabetes. As evidence suggests, untreated periodontal issues in diabetic patients significantly increase the risk of complications that may lead to hospital admissions. Chronic inflammation from periodontitis exacerbates glycemic control, creating a detrimental cycle that further compromises patient health. The need for an integrated approach that incorporates periodontal health as a fundamental aspect of diabetes treatment is emphasized. Implementing screening and treatment programs for periodontal health can improve patients' oral conditions while yielding substantial savings for healthcare systems by reducing hospitalization rates and associated costs. Education plays a vital role, as increasing patient awareness about the connection between oral health and diabetes encourages better self-care practices, ultimately leading to improved health outcomes. Research findings reinforce that effective periodontal treatment benefits not only oral health but also contributes to lowering diabetes-related complications and healthcare expenses. The conclusion drawn is that integrating dental care with diabetes management is essential for optimizing patient health, enhancing quality of life, and relieving the burden on healthcare systems. By prioritizing periodontal health, healthcare providers can help mitigate the impact of diabetes and improve overall patient outcomes.

Keywords: Periodontal Health. Diabetes Mellitus. Glycemic Control. Healthcare Costs. Integrated Approach.

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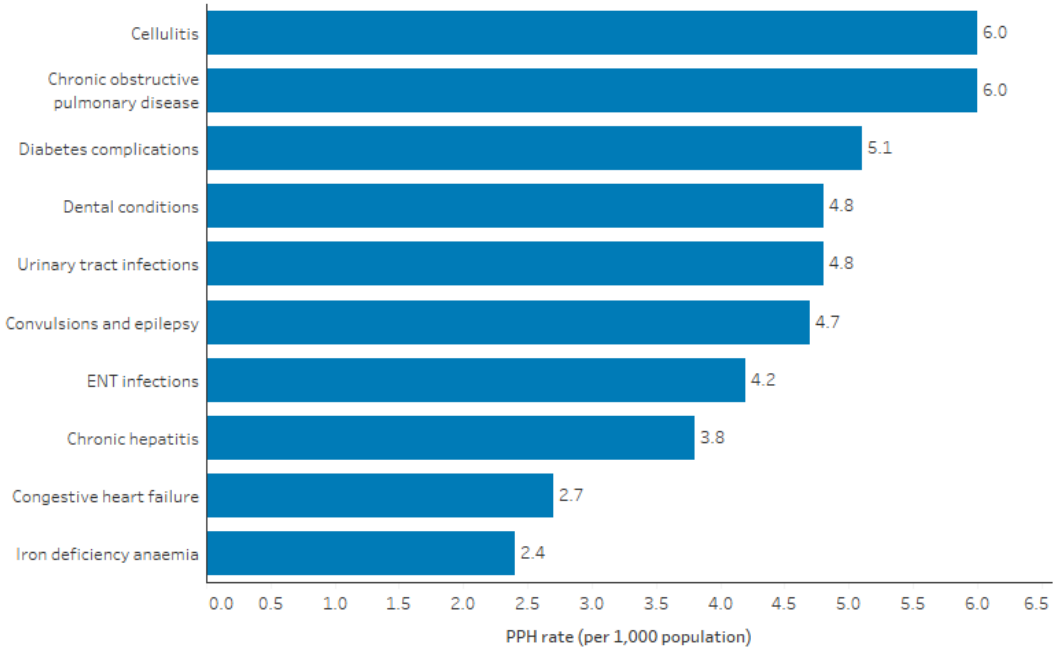
INTRODUCTION

Diabetes mellitus is a chronic condition that affects millions of people worldwide, bringing with it a series of complications that impact both the quality of life of patients and the healthcare system as a whole. One often overlooked aspect in the management of diabetes is periodontal health, which is intrinsically related to glycemic control and the occurrence of systemic complications. The integration of oral health with diabetes treatment offers a significant opportunity to reduce avoidable costs related to hospitalizations.

Studies indicate that diabetic patients with untreated periodontal disease face an increased risk of complications, such as infections and cardiovascular problems, which can lead to hospital admissions. Chronic inflammation caused by periodontitis can impair glycemic control, creating a vicious cycle that further compromises patient health. Therefore, an integrated approach that prioritizes oral health is essential for preventing these complications.

Implementing periodontal screening and treatment programs as part of diabetic care can not only improve patients' oral health but also generate significant savings for the healthcare system. Early detection and effective treatment of periodontal diseases can reduce the incidence of hospitalizations, leading to decreased expenses for medications and emergency procedures.

Figure 1: Potentially preventable hospitalisation rate.



Source: Australian Government (2021).

Moreover, educating patients about the relationship between oral health and diabetes is crucial. Promoting greater awareness can encourage self-care and adherence to oral hygiene practices, contributing to better glycemic control and a reduction in systemic inflammation.

The research conducted by Blaschke et al. (2020) provides robust evidence of the bidirectional association between periodontal diseases and diabetes, leading to the hypothesis that periodontal treatment may result in lower healthcare costs for newly diagnosed diabetes patients, promoting a milder disease course. The study analyzed a total of 23,771 individuals with health insurance coverage in Germany between 2011 and 2016, all aged 18 years or older and diagnosed with diabetes in 2013. Participants were divided into two groups: one that received periodontal treatment and another that did not. The analysis of the average effect of periodontal treatment on healthcare costs, including hospital, outpatient, and medication costs, was conducted using a robust method. The results showed that only 5.3% of the studied population was allocated to the treatment group, and newly diagnosed diabetes patients who received periodontal treatment showed a reduction in total healthcare costs, hospital costs, and diabetes-related medication costs compared to the control group. Thus, the findings of this study highlight that periodontal treatment is not only beneficial for oral health but can also contribute to the reduction of diabetes-specific complications and hospitalizations, resulting in lower healthcare costs.

Another research conducted by Shin et al. (2021) investigated the effects of regular periodontal management on total healthcare spending, hospitalization rates, and the initiation of insulin therapy in individuals with type 2 diabetes. Utilizing data from individuals prescribed diabetes medications during the fiscal year 2015, extracted from a claims database in Japan, researchers applied generalized linear models that accounted for factors such as sex, age, comorbidities, and the status of periodontal management in the previous two years. The analysis included 16,583 individuals and revealed that annual healthcare spending in the third year was 4% lower in the group that received consistent periodontal management, with an adjusted multiplier of 0.96 (95% CI: 0.92-1.00). Additionally, the adjusted odds ratio (aOR) for hospitalization for all causes was 0.90 (95% CI: 0.82-0.98). Notably, among individuals who had not received an insulin prescription in the previous two years (n=13,222), the aOR for the initiation of

insulin in the third year was 0.77 (95% CI: 0.64-0.92) in the group that received annual periodontal management. These findings suggest that regular periodontal care is associated with reduced healthcare costs, lower hospitalization rates, and a lower likelihood of requiring insulin therapy for diabetic patients.

The study by Jeffcoat et al. (2014) aimed to estimate the effects of periodontal therapy on medical costs and hospitalizations in individuals diagnosed with various chronic systemic conditions, including type 2 diabetes, coronary artery disease, cerebrovascular disease, rheumatoid arthritis, and pregnancy. Using claims data from 338,891 individuals with medical and dental coverage collected between 2011 and 2013, researchers included subjects diagnosed with at least one of the specified conditions and evidence of periodontal disease. Participants were categorized based on whether they completed treatment for periodontal disease in the base year of 2005. The study measured total allowed medical costs and the number of hospitalizations per beneficiary per year from 2005 to 2009. The results revealed statistically significant reductions in medical costs for individuals with type 2 diabetes (40.2%), cerebrovascular disease (40.9%), coronary artery disease (10.7%), and pregnancy (73.7%), with comparable outcomes observed for hospital admissions. However, no treatment effect was noted in the rheumatoid arthritis cohort. These results provide valuable evidence that non-invasive periodontal therapy can improve health outcomes for individuals with certain systemic conditions, particularly during pregnancy and in other chronic diseases.

Finally, the study by Cho et al. (2015) explored the relationship between continuity of outpatient care and hospitalizations in patients with type 2 diabetes in Korea. Since April 2012, a chronic disease management system, including diabetes, has been implemented through primary care clinics, reducing copayments for patients under the care of a single provider and improving continuity of care. Using data from the National Health Insurance Sample (NHIS) from 2009, researchers conducted a cross-sectional study to analyze diabetes-related hospitalizations. They assessed continuity of care using various indices, such as the Usual Provider Continuity (UPC) index, the Continuity of Care (COC) index, the Sequential Continuity of Care (SECON) index, and the Integrated Continuity of Care (ICOC) index. The results showed that patients with low scores on the COC (less than 0.75) had a significantly higher likelihood of hospitalization, with an odds ratio of 2.44 compared to patients with higher COC scores. The study also calculated the area under the receiver operating characteristic curve

(AUROC) for each continuity index to determine which best explained hospitalizations. The COC index demonstrated the highest AUROC (0.598), while the UPC, SECON, and ICOC indices showed similar AUROC values. These results suggest that maintaining high continuity of care may reduce the risk of hospitalizations for patients with type 2 diabetes, with the COC index exhibiting marginally greater explanatory power.

These investigations highlight the importance of periodontal health in the management of diabetes and suggest that integrated approaches prioritizing oral health can lead to significant improvements in health outcomes and a reduction in hospital costs.

The presented analysis highlights the importance of periodontal health in the management of diabetes mellitus, a chronic condition affecting millions of people worldwide. Evidence shows that oral health is intrinsically linked to glycemic control and the complications associated with diabetes, emphasizing the need for an integrated approach that considers periodontal health as a fundamental part of treatment. The implementation of screening and periodontal treatment programs not only improves the oral health of patients but can also result in significant savings for healthcare systems by reducing hospitalizations and related costs.

Studies demonstrate that diabetic patients with untreated periodontal problems face a heightened risk of complications that may lead to hospital admissions. Chronic inflammation resulting from periodontitis worsens glycemic control, creating a vicious cycle that further compromises the patient's health. Thus, educating patients about the relationship between oral health and diabetes is crucial, encouraging self-care practices and improving health outcomes.

The analyzed research reinforces that periodontal treatment not only benefits oral health but also contributes to the reduction of diabetes complications and healthcare costs. Therefore, effective integration between dental care and diabetes management is essential to optimize patient health, enhance quality of life, and alleviate the burden on healthcare systems.

REFERENCES

1. Australian Government. (2021). *Health system performance*. Available at: https://www.indigenoushpf.gov.au/measures/3-07-selected-potentially-preventable-hospital-adm.

2. Blaschke, K., Hellmich, M., Samel, C., Listl, S., & Schubert, I. (2020). The impact of periodontal treatment on healthcare costs in newly diagnosed diabetes patients: Evidence from a German claims database. *Diabetes Research and Clinical Practice*, 108641. https://doi.org/10.1016/j.diabres.2020.108641.

3. Cho, K., Lee, S., Jun, B., Jung, B., Kim, J., & Park, E. (2015). Effects of continuity of care on hospital admission in patients with type 2 diabetes: Analysis of nationwide insurance data. *BMC Health Services Research*, 15. https://doi.org/10.1186/s12913-015-0745-z.

4. Choi, J., Booth, G., Jung, H., Lapointe-Shaw, L., Tang, T., Kwan, J., Rawal, S., Weinerman, A., Verma, A., & Razak, F. (2021). Association of diabetes with frequency and cost of hospital admissions: A retrospective cohort study. *CMAJ Open*, 9, E406–E412. https://doi.org/10.9778/cmajo.20190213.

5. Jeffcoat, M., Jeffcoat, R., Gladowski, P., Bramson, J., & Blum, J. (2014). Impact of periodontal therapy on general health: Evidence from insurance data for five systemic conditions. *American Journal of Preventive Medicine*, 47(2), 166–174. https://doi.org/10.1016/j.amepre.2014.04.001.

6. Shin, J., Takada, D., Kunisawa, S., & Imanaka, Y. (2021). Effects of periodontal management for patients with type 2 diabetes on healthcare expenditure, hospitalization, and worsening of diabetes: An observational study using medical, dental, and pharmacy claims data in Japan. *Journal of Clinical Periodontology*. https://doi.org/10.1111/jcpe.13441.