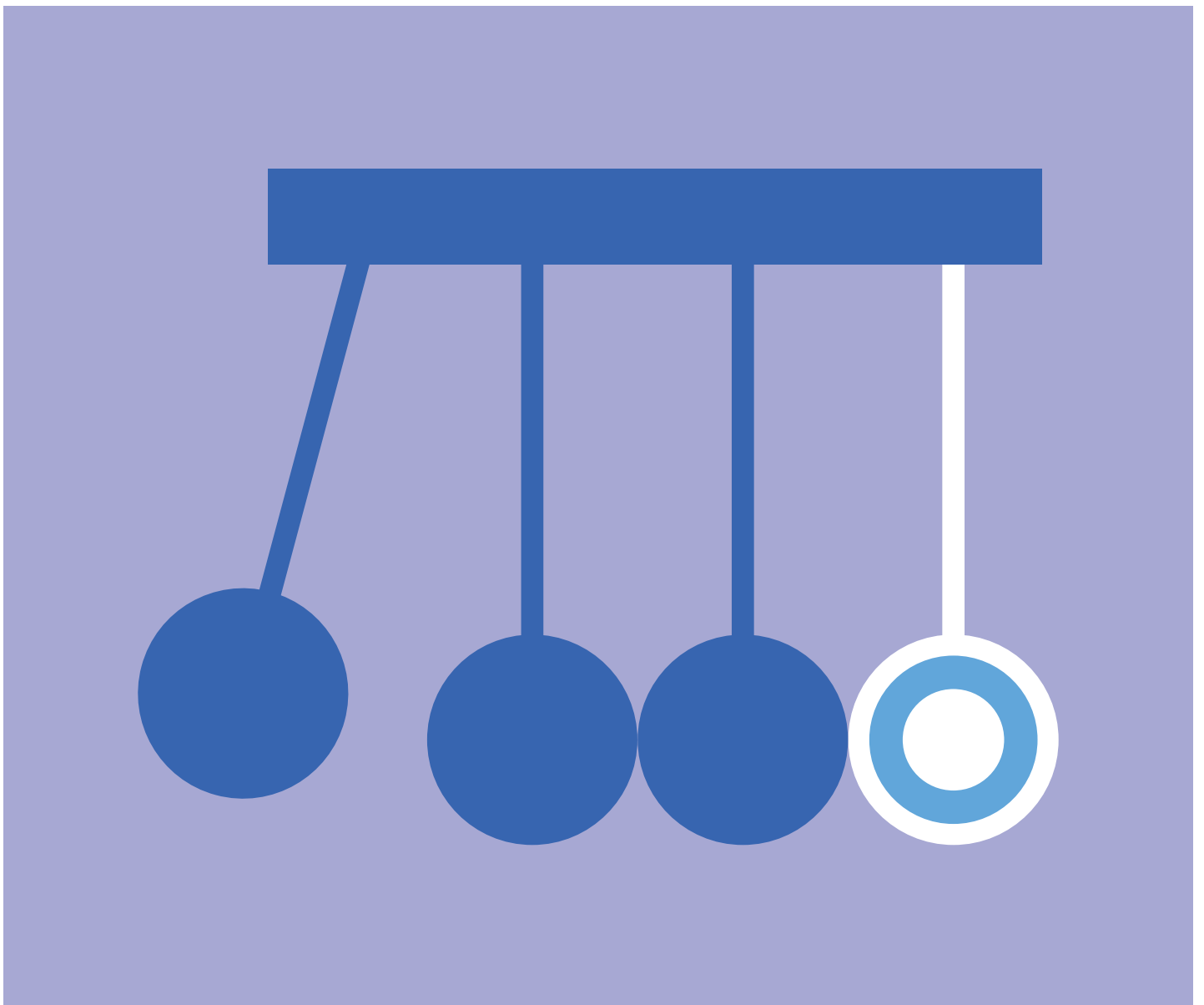


Summary of the **epidemiological evidence** on the **effect** of **periodontitis** on **diabetes**

(based on the systematic review and meta-analysis by Graziani et al. 2018)

Written by **Dr Evanthia Lalla**





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Part I

Summary of the epidemiological evidence on the effect of periodontitis on diabetes

(based on the systematic review and meta-analysis by Graziani et al. 2018)

1. Diabetes mellitus and periodontitis are common, chronic, non-communicable diseases that are closely linked.
2. The infection/inflammation associated with periodontitis can have detrimental effects on diabetes outcomes.
3. Consistent evidence indicates that severe periodontitis in people without diabetes contributes to worsening of glycaemia – as assessed by levels of haemoglobin A1c (HbA1c), or plasma glucose following fasting, or an oral glucose-tolerance test (OGTT) – and an increase in insulin resistance, as assessed by the homeostatic model assessment of insulin resistance (HOMA-IR) test. Severe periodontitis has also been shown to increase rates of incident prediabetes and type 2 diabetes.
4. The evidence is somewhat more limited when it comes to people with diabetes. It suggests that, if affected by severe periodontitis, those with type 2 diabetes are at a higher risk for poor glycaemic control compared to those with mild or no periodontitis, but some conflicting results have also been published. The impact of periodontitis on glycaemic control in type 1 diabetes has not yet been studied.

5. Significantly, people with type 1 or type 2 diabetes who are affected by periodontitis show a higher prevalence of other diabetes-related complications, including cardiovascular, cerebrovascular, renal, retinal, and neuropathic complications. Cardiovascular and overall mortality are also significantly increased in periodontitis patients with type 2 diabetes.
6. No conclusive evidence exists for an association between gestational diabetes and periodontitis, although a few studies have suggested that women with periodontitis are at a higher risk for developing gestational diabetes during pregnancy.
7. The quality of some of the 20 studies included in the 2018 systematic review and meta-analysis by Graziani et al. was limited and significant heterogeneity was noted in terms of study design, which means that some conclusions are not as robust as others or suitable for making generalisations.
8. Despite the limitations, the available data support the rationale for including periodontal education and prevention programmes – together with guidelines on periodontal screening, comprehensive evaluation, and treatment (as needed) - in the standards of care for patients with diabetes.

Part II

Editorial / expert opinion and additional points to consider

1. The 2018 Graziani et al. systematic review focused (by design) on the effect of periodontitis on diabetes outcomes. As we well know in the dental profession, the link between diabetes and periodontitis is bidirectional.
2. Poor glycaemic control in diabetes can potentially affect all cells, organs, and systems, and the mouth/periodontal tissues are no exception.
3. Accumulating evidence from around the world has demonstrated that diabetes adversely affects periodontal health. The relative risk of periodontal destruction in patients with diabetes is estimated to be approximately three times that of patients without diabetes. There is evidence that the severity of periodontitis and even its rate of progression may be increased in diabetes, although these data are more limited.
4. Periodontitis is a frequent complication of diabetes that appears to manifest early in the natural history of the disease, with the potential to contribute to periodontal destruction even relatively early in life.
5. Tooth loss – as a result of periodontitis, caries and/or issues related to access to care – is an important outcome to consider in diabetes, as it can significantly impair a patient's ability to consume a healthy diet in order to achieve and maintain metabolic and other diabetes-treatment goals. Studies have demonstrated that adults with diabetes are at a significantly increased risk of experiencing tooth loss and edentulism than adults without diabetes.
6. Periodontal parameters improve following standard non-surgical therapy in people with diabetes, even if glycaemic control is inadequate. Studies on the response to surgical or adjunctive treatments (e.g. antimicrobial) have been very limited.
7. The literature suggests that the adverse effect of diabetes on periodontal health is something about which both our medical colleagues and our patients need to be reminded, as both groups have been shown to be less aware of the periodontal complications of diabetes than its other systemic complications.
8. Patients of all ages with diabetes need to be educated on how to prevent the development of periodontitis and how to monitor for disease activity and seek periodic professional evaluation and care. Signs and symptoms of periodontitis may not be present upon diabetes diagnosis but may develop later, especially if glycaemic control is inadequate.
9. Type 2 diabetes is by far the most common type of diabetes mellitus and presents many similarities to periodontitis. Both pathologies may affect similar segments of the population, as they share some common risk factors and their prevalence is underestimated and under-reported. Behavioural modification and patient education is key to the management of

both conditions, and dental professionals are uniquely positioned to contribute to advice on lifestyle modification and risk reduction.

10. Patients affected by either disease may undergo a long asymptomatic phase and often remain unrecognised and untreated for several years.
11. Various studies have explored the ability of clinical periodontal parameters to identify patients with undiagnosed prediabetes or diabetes and findings suggest that such an approach is particularly promising. By assessing the presence of diabetes risk

factors in their patients, performing or ordering a screening blood test, referring to a physician for diagnostic testing, and following up on outcomes, dental professionals may positively affect patient health and well-being.

12. A key question to keep in the centre of our research and clinical efforts is: how can we all contribute to improving patient outcomes – both those related to health and those related to quality of life – in patients affected by diabetes and periodontitis? A concentrated, team-based, patient-centred effort is essential!



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The EFP thanks Sunstar
for its support and its unrestricted grant.

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