

A TWO-WAY RELATIONSHIP

The two-way association between diabetes and periodontitis, a highly prevalent but largely hidden chronic inflammatory disease, is widely accepted.¹ Patients with diabetes have a three to fourfold increased prevalence of severe periodontitis, and the severity of periodontitis is associated with poor glycaemic control.²

Periodontitis has been linked to an increase in insulin resistance, even in people without diabetes.³ Adverse outcomes in diabetes (including the increased risks of heart disease, stroke and early mortality) are more likely in the presence of periodontitis.⁴ For example, severe periodontitis is associated with a threefold increase in the incidence of end-stage renal disease in diabetes compared to patients who lack such disease.

Although the exact mechanism linking these diseases is not yet fully understood, it is believed to involve aspects of immune functioning, neutrophil activity, and cytokine biology.² There are also common lifestyle factors, such as obesity, physical activity, and diet that influence the progression of both conditions.

Periodontitis is widespread with most older patients showing signs of disease. The most recent Adult Dental Health Survey (2009) reported that 75% of dentate adults aged 55–64 years had signs of periodontitis (pocket depth or loss of attachment of ≥ 4 mm), and this increased to 82% in the 75–84 years group.⁵ Importantly, early stages may be reversible through dental intervention and plaque control measures. In later stage periodontitis teeth become mobile, are eventually lost, and the alveolar bone continues to deteriorate. The progression from mild to severe disease is associated with a range of non-modifiable factors (age and genetic susceptibility), modifiable factors (plaque, calculus, and smoking) and the presence of other health conditions (diabetes, HIV, and steroid treatment).⁶

This article discusses the importance of considering oral health, and in particular the prevention of moderate to severe periodontitis, as part of diabetes management. In addition to the self-management activities already recognised as essential in diabetes care, behaviours to control the progression of periodontitis should also be encouraged. These include self-performed plaque control, such as by flossing, and attending the dentist for regular dental check-ups.

A NEGLECTED RISK FACTOR?

Despite the persuasive epidemiological evidence linking periodontitis with adverse outcomes in diabetes, at present there is very limited oral health awareness among patients with diabetes or the health professionals who care for them. This appears to be an international pattern with surveys from across Europe, North America, and the Middle East reporting low awareness of the importance of oral health in diabetes. This may reflect limitations in communication and integration at the interface between dental and general medical healthcare services and gaps in the training of health professions, together with a lack of research evidence of the impact of oral health promotion on diabetes outcomes.

It has long been recognised that the careful and regular removal of dental plaque prevents the progression of periodontal disease in the general population,⁷ but experimental studies of the effectiveness of such interventions on diabetes outcomes are lacking. However, it is likely that preventing the progression to moderate or severe periodontitis may have benefits that are of similar size of effect to those reported following the successful treatment of severe periodontitis. This has been reported as leading to improvements in glycaemic control equivalent to 2 mmol/mol (0.4%) HbA1c;^{8,9} a randomised controlled trial to confirm this finding in the UK is currently underway (Periodontitis and Type 2 Diabetes Mellitus; ISRCTN83229304).

INTEGRATING ROUTINE DIABETES CARE AND ORAL HEALTH

Authoritative bodies already state a need for

action to address the risks posed by poor oral health in diabetes. The International Diabetes Foundation, for example, published a guideline recommending that primary care professionals routinely ask about current oral health and oral self-care, and include advice to seek care from a dental professional (Box 1).¹⁰ Likewise, the European Society of Cardiology has stated that oral health should be promoted as part of a healthy lifestyle and as an important component in the prevention of cardiovascular disease.⁴ However, in the UK oral health in diabetes receives little attention from authoritative bodies; it is not included in the quality standards for clinical best practice published by NICE.¹¹

We recently asked patients where they would like to be provided with information and advice about oral health that is relevant to their diabetes. Most saw the dentist as central to managing specific oral health needs, but felt the GP team was better placed to provide general advice about oral health and its relevance to diabetes. This is important as not all patients regularly attend the dentist, and fits with GPs providing information about other aspects of diabetes that are managed by associated services (such as, eye screening and podiatry). The model of shared care that emerged is summarised in Box 2.¹²

General practice teams will need to become more aware about the various oral manifestations of diabetes if they are to become more effective at preventing, diagnosing early and, when appropriate, making timely referrals to oral health specialists. Training may be needed to improve the confidence of GPs and practice nurses to ask questions related to oral health, spot potential problems, and advise patients to seek dental care. A simple oral

Box 1. Recommendation on clinical care for people with diabetes¹⁰

1. Enquire annually as to whether each person with diabetes follows local recommendations for day-to-day dental care for the general population, and (where access permits) attends a dental professional regularly for oral health check-ups.
2. Enquire at least annually for symptoms of gum disease (including bleeding when brushing teeth, and gums which are swollen or red).
3. In those people not performing adequate day-to-day dental care, remind them that this is a normal part of diabetes self-management, and provide general advice as needed. Advise those not attending for regular dental check-ups on the importance of doing so (where access permits).
4. In those people with possible symptoms of gum disease, advise them to seek early attention from a dental health professional.
5. Education of people with diabetes should include explanation of the implications of diabetes, particularly poorly controlled diabetes, for oral health.

Box 2. Shared care model of oral health and diabetes: roles and responsibilities.¹²

Patients:

- Inform dentist about their diabetes and any changes, for example, in medication
- Aim to adhere to recommendations

Dental professionals:

- Give oral health information tailored to people with diabetes
- Communicate with primary care professionals

Primary care professionals:

- From the point of diagnosis of diabetes onwards, give information on importance of oral health
- Provide written leaflets about diabetes and oral health
- Routinely discuss oral health at diabetes reviews

health item could be included in the routine diabetes review. There is also a need for materials to improve patients' awareness of the importance of oral health, their access to dental services, and their confidence in oral health self-care.

Greater organisational integration between general medical practice and general dental practice also needs to be considered to ensure that people with diabetes receive consistent advice and support regarding their oral health. In the UK, most patients with diabetes who are managed by general practice teams also have access to NHS dentists, but models of integrated diabetes care that span general medical and dental practices are lacking.

In the UK, greater involvement of dental professionals in health promotion is already being urged, and dentists could become involved in blood glucose testing of people at risk of diabetes or screening for hypertension. Prevention and self-care advice is likely to become a cornerstone of the new dental contract scheduled to be implemented in 2014. This focus on prevention and continuity of care should enable stronger links between general practice and dental practice teams.

RESEARCH IS NEEDED TO INFORM POLICY AND PRACTICE

The links between oral health and diabetes are part of a complex multifactorial picture, with several common risk factors and behaviours affecting both. The early identification and treatment of periodontal infection may be important to delaying the progression of diabetes, as well as cardiovascular disease outcomes.

While authoritative guidance already supports the inclusion of oral health as an integral component of diabetes management, more evidence is needed to drive clinical practice and policy about how this should be done. Research is needed to answer the following questions:

- What types of patient information and education are effective in raising patient awareness of the importance of oral health in diabetes?
- Does inclusion of oral health as a routine item in patients' annual diabetes review improve oral self-care of people with diabetes, including regular dentist visits?
- What impact does improvement in oral health and the prevention of periodontitis have on diabetes outcomes?
- What is the cost effectiveness of GPs/practice nurses promoting oral health and the use of the dental services as part of their diabetes care?
- What is the scope for dental and GP teams developing shared protocols for oral health in diabetes?

SUMMARY

- There are recognised bi-directional associations between poor oral health and type 1 and 2 diabetes.
- An emerging consensus has identified low levels of patient and professional awareness as a problem.
- Oral health is not currently covered in diabetes education programmes or as part of self-management education in primary care.
- Primary care should consider integrating oral health with routine diabetes care.
- More research is needed to identify successful interventions and their effect on levels of periodontitis, diabetes outcomes and oral health awareness.

Jeremy Dale,

Professor of Primary Care, Division of Health Sciences, Warwick Medical School, University of Warwick.

Antje Lindenmeyer,

Senior Research Fellow, Warwick Medical School, Warwick.

ADDRESS FOR CORRESPONDENCE

Jeremy Dale

Division of Health Sciences, Warwick Medical School, University of Warwick, Coventry, CV4 7AL

E-mail: jeremy.dale@warwick.ac.uk

Edward Lynch,

Head of Warwick Dentistry, Warwick Medical School, Warwick.

Paul Sutcliffe,

Associate Professor, Warwick Evidence, Warwick Medical School, Warwick.

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