Defining risks for diabetics

Christopher Turner consideres what dental practices should be aware of.

Periodontal disease (PD) is the sixth complication of diabetes mellitus (DM) and was first described in 1928. Diabetics have a three to four times greater risk of developing PD than non-diabetics (for smokers the risk is 10 times).

While the pathophysiological mechanism of the relationship between the two diseases is still under investigation, there is a common pathogenesis between DM and PD involving an enhanced inflammatory response at both local and systemic level. This is caused by the chronic effects of hyperglycaemia and the formation of glycation end-products that promote the inflammatory response. There are raised markers of inflammation such as C-reactive protein, cytokines and tissue necrosis factor in both diseases. High glucose levels stimulate the formation of osteoclasts with enhanced resorption and diminished bone formation, and this may be why there is greater loss of alveolar bone in diabetics. It is the severity of hyperglycaemia that affects the periodontium most.

Although PD is not a classic infection because it does not follow Koch's Postulates, inflammatory products from Gram-negative bacteria in plaque give rise to a chronic bacteriological challenge and are a persistent source of inflammatory mediators that may lead to endothelial dysfunction.

Endothelial dysfunction is associated with cardiopathic and arterial complications and raises morbidity fourfold and may be a factor in nephropathy where diabetics on haemodialysis are at greater risk of PD. Periodontal disease also predicts the development of overt nephropathy and end-stage renal disease in a dose dependent manner in individuals with little or no pre-existing kidney disease. Periodontal management➲

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can contribute to the prevention of severe renal disease raising the question whether all patients requiring haemodialysis should have a pre-treatment periodontal disease screening.

Neuropathy is a microvascular complication and associated with the development of xerostomia that can affect over 40 per cent of diabetics and give rise to an increased risk of developing caries. There is an inverse relationship between salivary flow and HbA1c levels that may be due to a disturbance in glycaemic control. Other oral symptoms are burning mouth and impaired taste that contribute to morbidity and a low quality of life and can be overlooked. Dentists faced with a patient with these symptoms should make an early referral to check and eliminate pre-diabetes or diabetes.

An increasing severity of retinopathy has been associated with PD. Premature births and pre-eclampsia also have been associated with high levels of PD that in turn may give rise to patients developing type 2 diabetes.

Case report

Siddiqi et al (2020) have called for greater co-operation between doctors and dentists in treating diabetics. The following case illustrates the point.

Mrs D has been a type 1 diabetic for 25 years and has recently lost weight because her HbA1c glycated haemoglobin is 6.6 and has been higher. She has attended the same dentist for 40 years and been told her teeth are satisfactory despite no radiographs, episodes of periodontal abscesses and extractions including both mandibular central incisors replaced with a gum-stripping removable acrylic partial denture. Her BPE scores are two or three in each sextant. She has never had a full mouth pocket measurement although this is recommended when there is a score of three or more in any sextant, and was only told what her scores were when she asked directly.

This is a chicken and egg situation. Her doctor does not know about her periodontal health and is struggling to maintain her HbA1c below the recommended maximum of 6.5, and her dentist is unaware that high glycated haemoglobin levels could be contributing to the difficulties in her dental care.

Discussion

With these related risks that affect the working lives of doctors and dentists it is surprising that there is little or no contact between these two professional groups and the sharing of clinical results. Few doctors are aware of the importance of PD for their diabetic patients, only 5.7 per cent in a recent survey. In the UK the Department of Health and Social Care's website for diabetics fails to mention PD, NICE has refused a request to have dental checks added to their list for doctors, and the main charity, Diabetes UK, is more concerned with salivary sugar. Periodontal disease warrants only a passing mention. This needs to change.

It is quite clear that PD and DM affect each other. Some PD patients are at risk of developing type 2 diabetes and pre-eclampsia in addition to greater severity of the well-documented five other risks. However, PD has an adverse but modifiable effect on glycaemic control, and its progression is associated with an increase in HbA1c levels in type 2 diabetics. Periodontal therapy improves metabolic control so the overall management of DM may improve because the HbA1c level falls.

It follows that dentists have a very important role to play in treating these patients and helping them improve their daily plaque control because that reduces the inflammatory load, by removing calculus, eliminating pockets and extracting unsaveable teeth. They also need to share a simple method of describing periodontal risks to their diabetic patient's doctors. The simplest periodontal index to use is the BPE scores because that is a routine at every dental examination and has been put forward as the international standard to use. The method is as follows:

Develop a pro forma for the doctor. Report the sextant scores together with the date of examination as normal, what each number means and then take the highest score of all from any sextant. This is the risk number. The risk can then be defined simply:

- 0 – 1, low, let us call that green
- 2 – 3, medium, let us call that amber
- 4 – 4*, high, let us call that red

In return ask for the HbA1c results remembering that the normal maximum is 6.5. These results can be classified:

- 0 -2, low, let us call that green
- 3-5, medium, let us call that amber
- 6 and above, let us call that red

In this way it will be possible to develop an easily understood method of communication that then must be shared with each patient. Doctors need to be aware that they should associate higher HbA1c levels with uncontrolled periodontal disease and seek a dental opinion given the two-way relationship of PD and DM. Ideally the last two sets of results should be recorded as that will enable trends in disease progression or regression to be monitored.

The above scheme is for those diabetics who attend for dental care. However, it is reported that about 40 per cent or more of the UK adult population do not seek dental care. The question that has to be asked is how will they find out about their increased periodontal risks when their doctors have not been taught and can be reluctant to accept that dental opinion does count and there is no publicity from the Department of Health and Social Care?

Conclusion

As we approach the centenary of the first description in the dental literature of the link between DM and PD, I suggest that it is our professional responsibility to take the lead in that process to achieve a paradigm shift in the care of diabetics - especially when it is predicted that this group of patients will consume 10 per cent of the NHS budget in the near future. In the absence of guidance from bodies such as NICE, by what other means will doctors learn about the role that dentists can play in the treatment for this rapidly increasing group of patients?

As we hopefully come to the end of the restrictions and damage that the covid pandemic has caused for dentists and their patients perhaps now is the time to review both prevention strategies and how best care might be provided for potentially high risk groups such as diabetics.

References available on request.