Looking through the window

Yvonne Gordon reports back from a conference looking at the links between oral and systemic health

With fewer patients visiting the dentist and running increased risk of periodontal disease, top professors in dentistry and medicine are gathering more and more evidence for the link between periodontal disease and systemic health, in particular heart disease and Type 2 diabetes, both of which are increasing at alarming rates, both in the UK and globally.

At the recent Oral and Dental Research Trust’s (ODRT) symposium at the QEII1 Conference Centre in central London – The Impact of Oral Health on Systemic Health: What is the Evidence and How Big is the Problem? – a series of experts addressed the audience with their research, yielding fascinating results.

Clinicians, academics, scientists and other interested parties packed the lecture theatre at the QEII1 Conference Centre to hear an array of prestigious speakers from the UK and US.

Professor Nairn Wilson, CBIE, dean and head of the dental institute at Guy’s, St Thomas’ and King’s College hospitals and ODRT chairman, introduced the one-day event, chaired by Professor lain Chapple. The idea for the conference was born out of the review – A Strategic Review of Oral & Dental Health in the UK – a position paper published by the British Society for Dental Research.

Prof Wilson said: ‘From this paper arose the need to inform the public of the importance of oral health in relation to general health, as a result of which pilot projects were developed.

‘Oral diseases are among the most common to affect humans and systemic diseases present around the oral cavities, which has an influence on Type 2 diabetes and cardio-vascular conditions. Oral cancer is growing in families and the young, with a 50 per cent survival rate. The cost is huge.’

Periodontal disease affects the supporting structures of the teeth, when the epithelial cells are irritated and gingivitis develops. In most people, this destroys the bone and the supporting tissues of the teeth, gradually exposing the connective tissues. In five to 10 years, the exposure of the ulcerated surface to bugs causes periodontitis.

Tell-tale signs

Professor Mike Lewis from Cardiff University, who is also dean of the dental faculty at Glasgow and vice-president of the Royal College of Physicians and Surgeons, talked about the mouth as a window on the body.

He said: ‘You can tell a lot from looking at the tongue, from which the Chinese can diagnose 300 conditions. Mouth ulcers can reflect haematic or nutritional deficiency or gastro-intestinal problems. Ulcerative gingivitis is caused by immuno-suppression. Dry mouth could indicate undiagnosed diabetes. Many diseases are reflected in the mouth and early recognition may assist diagnosis and outcome.’

More studies are needed, but researchers suspect that bacteria and inflammation linked to periodontitis can also play a role in systemic diseases or conditions such as blood cell disorders, which can lower the body’s resistance to infection, making periodontal diseases more severe.

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Several studies link chronic inflammation from periodontitis with the development of cardio-vascular problems. Some evidence suggests that oral bacteria may be linked to heart disease, arterial blockages and stroke.

People with diabetes often have periodontal disease. In addition, there is evidence that people with diabetes are more likely to develop and have more severe periodontitis than those without diabetes. Some studies suggest that periodontitis can make it more difficult for people with diabetes to control their blood sugar.

Although periodontitis may contribute to these health conditions, it doesn’t necessarily mean that one condition causes the other. That is why researchers are examining what happens when periodontitis is treated in people with these various health problems.

Prevention better than cure

Given the potential link between periodontitis and systemic health, problems, prevention may be an important step in maintaining overall health. Dentists should ensure that patients brush thoroughly twice a day and clean between the teeth once a day, as well as eat a balanced diet and limit snacks. Patients should be educated that regular dental check-ups and cleaning are essential, because professional cleanings are the only way to remove calculus, which traps plaque bacteria along the gum line.

Diabetes specialist, Professor Rhys Williams, dean of medicine and professor of dental epidemiology at the School of Medicine in Swansea, looked at the extent of the growing problem of diabetes mellitus. He said 80 to 90 per cent of sufferers have Type 2, which has increased drastically in the United Arab Emirates due to its transformation from a subsistence society to a wealthy one and the subsequent effect on nutrition and physical activity, Latin America, Africa and Asia have also seen a huge increase due to urbanisation and change in diet. In the UK, there is an increase of four per cent, largely due to earlier detection, increasingly sedentary lifestyles, obesity and fast food. There are about half a million undiagnosed cases in Wales. Prof Williams said: ‘Diabetes affects many parts of the body. The vast majority of people with diabetes will have cardio-vascular disease, most of whom are women.’

Dr Philip Preshaw, from Newcastle University’s school of dental science and institute of cellular medicine, spoke about whether periodontal disease and diabetes had a bi-directional relationship. He said the mouth should not be looked at in isolation from the rest of the body. He said: ‘Type 2 diabetes is a result of poor diet and low physical activity. One in 10 children is overweight worldwide and there will be 300 million sufferers globally by 2025. One in three people born in the US in 2000 will develop diabetes.’

He explained the ‘thrifty gene’ hypothesis. ‘Humans can deal with different environmental challenge in scant times. The problem now is that in times of plenty we can have too much. The same geno-type which protects us against starvation in times of crisis, causes a risk of diabetes in times of plenty.’ He said periodontal disease was often found in diabetics. For example, 60 per cent of diabetic Pima Indians had periodontal disease, compared to 56 percent in non-diabetics.
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The mechanistic links

His talk was followed by Dr Christine Ritchie from the University of Alabama, who gave a detailed presentation about the mechanistic links between Type 2 diabetes and periodontitis and then Professor Mark Caulfield, who gave an overview of atherosclerotic vascular disease and ischaemic stroke in the UK.

Professor Panos Papapanou from Columbia University looked at the evidence for periodontitis and macrovascular disease. He said men with periodontal disease had 4.3 times higher risk of stroke. His research includes the role of periodontal infections as independent risk factors for systemic disease, in particular, the role of periodontitis in the development of atherosclerosis, cardiovascular and cerebrovascular disease.

Professor Thomas Van Dyke, Director of the Periodontology Research Laboratories at Boston University spoke about unravelling the links between cardiovascular disease and periodontitis. He said: ‘Both conditions have a large inflammatory component. The control of inflammatory response can prevent periodontitis as well as early vascular changes. Greater understanding of the complex pathways involved in inflammation may provide alternative therapeutic strategies to combat inflammation and chronic diseases potentially arising from it.’

In his paper, Understanding and Managing Periodontal Diseases: A Notable Past, a Promising Future, published July 2008, Prof Van Dyke wrote: ‘At the end of the 20th century, an old concept in medicine and dentistry reappeared: that the infection and inflammation of periodontal disease in the mouth could reach distant sites via the bloodstream. Apparently oral disease could, in fact, contribute to systemic diseases such as atherosclerosis, diabetes, as well as adverse outcomes in pregnancy. This concept of oral health in relation to general health connection is now supported by sound and rational evidence-based observations. Clearly, the 21st century has arrived with a new understanding of the nature of periodontal diseases based on a notable era of discovery. There is a promising future for preventing and treating this condition and treating condition that affects not just the mouth but also the whole body.’

Joinied-up thinking

The overall consensus at the symposium was that there was a need for cross-discipline and collaborative research projects, because public health was suffering due to the divorce between dentistry and medicine. It was originally observed in the late 1980s that patients with acute myocardial infection (MI) had significantly more dental problems such as periodontal disease than subjects without M1. Members of a consensus group of physicians and dentists met earlier this year to review the current evidence linking periodontal disease to overall health.

The Potential Impact of Periodontal Disease on General Health; a Consensus View, published by, Current Medical Research and Opinion 2008, states that: ‘The infectious and inflammatory burden of chronic periodontitis is thought to have an important systemic impact.’

The article states that periodontitis is associated with an increased likelihood of coronary heart disease and may influence the severity of diabetes, although a ‘causal relationship still needs to be demonstrated between periodontal disease, cardiovascular disease, and diabetes, through relevant prospective studies. However, it acknowledged that periodontal disease is more severe in people with diabetes mellitus, a group already at increased risk for cardiovascular events.

In the paper, the consensus group expressed an urgent need for dentists and physicians to work together in understanding and improving patient health. It concluded that good oral health is an integral component of general health and acknowledged that research into the inflammatory patho-physiology of periodontitis, cardiovascular disease and diabetes was revealing potential links between the conditions.

Therefore cross-discipline communication and research between dentists and physicians was essential to improve understanding of the risks.

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