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EuroPerio9 press release

Unhealthy diets may contribute to gum disease

Nutritional interventions offer potential to reduce inflammation

Amsterdam, the Netherlands. 21 June 2018 – According to a presentation at a EuroPerio9 press conference today, nutrition may have an impact on periodontal disease (1) and its treatment.

“Evidence is emerging from epidemiological and intervention studies that nutrition may contribute to periodontal disease in susceptible individuals (2),” said Prof Iain Chapple, the Periodontal Research Group, School of Dentistry, College of Medical & dental Sciences, the University of Birmingham, Birmingham, United Kingdom. “For many years people’s diets have been shown to have an impact in a range of chronic inflammatory diseases, but in recent years there has been an increasing body of research about the role of nutrition in periodontal disease.”

Periodontitis is a complex disease initiated by an inflammatory response to dental plaque. However, dental plaque alone is insufficient to cause periodontitis. A variety of factors have been identified that tip the balance from health to disease. These can be genetic, environmental or involve lifestyle (exercise, smoking and nutrition).

“Nutrients from the diet are essential for life and provide crucial energy sources in the form of macronutrients and micronutrients,” explained Prof Chapple. “The former may contribute to inflammation, whereas the latter are vital co-factors that regulate oxidative stress in human cells. Micronutrients may also regulate gene transcription factors.”

Oxidative stress is a key driver of chronic inflammation and as a result has a central role in the origins of a wide range of chronic inflammatory diseases (e.g. type 2 diabetes, cardiovascular disease and metabolic syndrome). It has been proposed as a common link between periodontitis and systemic disease (3). Oxidative stress can cause direct tissue damage by altering molecules, such as proteins, lipids and DNA.

It is already established that increased oxidative stress triggers a wide range of damaging cellular and molecular events and that increases in oxidative stress can result from normal cellular metabolism (4). Increased dietary levels of simple sugars or saturated fat enhance oxidative stress levels and inflammation.

“Research using an experimental gingivitis model has shown increased levels of bleeding on probing when participants were fed with a diet high in carbohydrates, when compared to those on a low sugar diet (5),” said Prof Chapple. “This finding has been further supported by a study investigating volunteers placed on a primitive diet which was high in fibre, anti-oxidants, and fish oils, but low in refined sugars and with no oral hygiene measures (6). As would be expected plaque levels increased significantly and classic

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periodontal pathogens emerged within the biofilm, but unexpectedly gingival bleeding significantly reduced from 35% to 13%. These studies support a role for nutrition in controlling periodontal inflammation. However, to date, the precise mechanisms underpinning this observed dietary effect, have yet to be fully elucidated.”

Control of dietary sugar and fat intake can help reduce levels of oxidative stress and inflammation. Research has shown the importance of amounts of simple sugars, carbohydrates and fat intake entering the blood stream, but it indicates that frequency of intake is also a key factor in generating oxidative stress: the more frequent the intake the greater the inflammation recorded in blood vessels (7).

“Foods rich in antioxidants may help reduce oxidative stress, for example green leafy vegetables (broccoli, spinach etc.), berries (e.g. blueberries, blackberries, cranberries, strawberries etc.), red beans, red wine, and dark chocolate with greater than 70% cocoa,” said Prof Chapple. “Diets that slow down digestion resulting in less pronounced spikes in blood glucose, including, for example, nuts, olive and fish oils which also have antioxidant properties, are also effective.”

Regarding dietary supplementation with vitamins or antioxidants, Prof Chapple said they often fail to demonstrate the expected benefits. “It is now recognised that such supplementation fails to account for the complex interactions present in natural food sources. It has been demonstrated that the interaction of a natural food source provides a number of additional benefits over and above that of the single component (8),” he explained.

The physiological impact of diet depends upon many factors, including absorption from the gut into the circulation. “It is also becoming clear that differences in genetic makeup account for a diverse array of responses to dietary supplementation, something that needs to be taken into account when a new dietary intervention is proposed. One size may not fit all,” said Prof Chapple.

“There is a growing interest in the implications of nutritional interventions for managing inflammatory diseases like periodontitis, however diets that may be beneficial for one individual, may not have the same effects in another (e.g. diets rich in beta-carotene) (9), due to differences in our genetic code (nutrigenetics),” explained Prof Chapple.

Prof Chapple concluded: “Nutritional interventions may help to manage inflammatory diseases such as periodontitis, but understanding each individual’s genetic background is critical in an era of individualised medicine. Nevertheless, we can safely recommend that our patients increase their intake of fish oils, fibre, fruit and vegetables and reduce levels of refined sugars as part of a periodontal prevention/treatment regime. This diet has shown to benefit periodontal health as well as general health.”

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Notes to Editors

References:

1. Abstract 2774 **The role of nutrition: Boost or damage of immune system?** Iain Chapple. To be presented at the Team Session on the Role of Nutrition on 22 June 2018 at 10:30.

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About the EFP

The European Federation of Periodontology (EFP) is an umbrella organisation of 30 national scientific societies devoted to promoting research, education and awareness of periodontal science and practice. It represents more than 14,000 periodontists and gum-health professionals from Europe, northern Africa, and the Middle East.

About EuroPerio9

EuroPerio is the world's biggest scientific meeting devoted to periodontology. The most recent of these triennial meetings, EuroPerio8, took place in London in June 2015 and brought together almost 10,000 people. EuroPerio9 will take place from 20 to 23 June 2018 at the [RAI](#), Amsterdam, The Netherlands.

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