

Promoting Periodontal Health Through Healthy Eating Patterns

NUTRITION



Dr Sanna Syrjäläinen

Dentist, clinical teacher, and post-doctoral researcher in Periodontology at the University of Turku Institute of Dentistry and HUS Helsinki University Hospital

Author — Dr Sanna Syrjäläinen

Can what we eat influence the health of our gums? A growing body of research suggests that the answer is yes. Beyond brushing and flossing, dietary choices appear to play an important role in shaping the body's inflammatory response, the oral microbiome, and ultimately the risk of developing periodontitis. While no single food can prevent or cause gum disease, evidence increasingly points to the benefits of a balanced, anti-inflammatory diet rich in fruits, vegetables, whole grains, fish, and healthy fats. As periodontitis becomes more common in ageing populations, nutrition is emerging as an important – and modifiable – piece of the periodontal health puzzle.

Periodontitis is a microbe-induced inflammatory disease of tooth-supporting tissues (1). The pathogenesis of periodontitis is multifactorial, involving a complex interplay between the subgingival microbiota and the host immune response (2). An increasing body of evidence suggests that periodontitis is linked to systemic diseases, illustrating how oral health reflects overall systemic health. In addition, the prevalence of periodontitis is expected to increase as the population ages (3), which underscores the importance of identifying modifiable risk factors to prevent the onset of the disease.

Diet is one potential lifestyle factor that may modulate host susceptibility to periodontitis, and research around this topic has been active. Diet may affect periodontal health through direct physiological actions, as exemplified by vitamin C and its role in stabilising collagen (4). On the other hand, diet can indirectly influence periodontitis by modulating the host response, such as immune function or oxidative stress. Additionally, dietary habits shape the composition of the oral microbiome (5).

Key nutrients and their impact on gum health

A variety of nutrients have been examined in relation to periodontitis. For example, through their antioxidant properties, vitamins A, C, and E are thought to protect against tissue damage caused by oxidative stress, which is one of the key pathological cascades in periodontitis (6). Vitamin D, however, is believed to protect against periodontitis via its role in bone metabolism and immunity (7).

Fairly convincing evidence also suggests a link between certain macronutrients and the development of periodontitis. A reduction of free sugars in diet (i.e. added monosaccharides and disaccharides in foods) has been associated with reduced gingival inflammation (8). Also, a higher dietary saturated fatty acid intake as well as high ratio of n-6 to n-3 polyunsaturated fatty acids (PUFAs) has been associated with an increased risk of periodontitis and tooth loss (9,10). Conversely, higher intake of n-3 PUFAs has been associated with lower prevalence of periodontitis (11,12), and omega-3 supplementation seems to enhance periodontal healing when used as an adjunct to periodontal treatment (13).

While there are plausible biological pathways for the above-mentioned nutrients to affect periodontal health, the findings from population-based studies and randomised controlled trials remain inconclusive (14).

> Diet alone does not dictate whether an individual develops periodontitis, but it serves as one important risk among many.

The whole diet approach: Beyond single nutrients

Focusing exclusively on single nutrients, on the other hand, fails to account for the inherent complexity of the diet and the synergistic interactions and intercorrelations between nutrients (15). Moreover, the effect of single nutrients may be too small to detect, whereas combining the intake of multiple nutrients into dietary patterns may provide sufficient power to detect associations. To address these issues, a whole diet approach has been adopted in many studies to analyse the overall role of the diet in the risk of periodontitis.

One common method is to use a pre-defined scoring system, where researchers evaluate a person's diet by comparing it to established nutritional guidelines or well-known healthy diets, such as the Mediterranean diet or the Healthy Eating Index (HEI) (15). A study analysing 1,197 post-menopausal women found four dietary patterns – the HEI, alternative HEI, alternate Mediterranean diet, and Dietary Approaches to Stop Hypertension (DASH) – to be associated with better clinical periodontal measures (16). Another study examining hospital patients in the UK found that lower adherence to the Mediterranean diet was associated with more severe gum disease (17). There are similar results from multiple observational studies showing a reduced risk of periodontitis in people who adhered to a healthier diet (18).

The inflammatory potential of diet

As periodontitis is an inflammatory condition, researchers are increasingly focusing on the "inflammatory potential" of the diet in relation to periodontal health. A randomised controlled trial conducted by Woelber et al. showed that shifting to an anti-inflammatory diet – rich in n-3 PUFAs, vitamins, and fibre while low in processed sugars – can significantly reduce gingival inflammation in just four weeks, even without changes in plaque levels (19). This link is further supported by large-scale, population-based studies showing that higher dietary inflammatory potential is linked with an increased risk of periodontitis (20–22).

Clinical implications and future directions

Periodontitis is a complex disease, and diet alone is unlikely to either prevent or cause it. However, given how common the condition is and the significant burden it places on both individuals and healthcare systems, identifying modifiable lifestyle factors is essential. Research into the link between nutrition and gum health has become highly active, exploring the issue from many different angles.

While diet alone does not dictate whether an individual develops periodontitis, it serves as one important risk factor among many. The core evidence supports the consumption of fruits, vegetables, unsaturated fats, whole grains, and fish, while consistently recommending the limitation of components like refined sugars, saturated fats, and processed meat products that contribute to systemic inflammation. Furthermore, maintaining a healthy weight remains a cornerstone of preventing gum inflammation (23,24). Ultimately, these principles align perfectly with national dietary guidelines worldwide. For both clinicians and policymakers, integrating nutritional awareness into periodontal care is an evidence-based strategy. Supporting and enabling these dietary changes not only improves periodontal health but also drives systemic well-being.

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