



**IMPROVING THE EFFECTIVENESS OF DIET THERAPY IN PERIODONTAL
DISEASE: A MODERN PERSPECTIVE ON THE PROBLEM**

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Abstract

Relevance. Periodontal disease is a widespread oral pathology that affects the supporting tissues of the tooth. Drug and surgical treatment do not always provide stable results without correcting lifestyle factors, among which nutrition plays a central role. Objective – to assess the possibility of increasing the effectiveness of periodontal disease treatment through targeted dietary changes and to develop specific nutritional recommendations. Materials and methods. An analysis of open data on the influence of macro- and micronutrients on the condition of the periodontium was carried out, using a method of comparative assessment of clinical outcomes under different dietary patterns. Results. It has been shown that increasing the proportion of plant fiber, polyunsaturated fatty acids, antioxidant vitamins and probiotics in the diet helps reduce the depth of periodontal pockets, decrease gum bleeding and slow down bone resorption. Conclusion. The introduction of evidence-based diet therapy into the comprehensive management of patients with periodontal disease can increase treatment effectiveness by at least 30% and reduce the frequency of relapses.

Keywords: periodontal disease, diet therapy, dietary fiber, omega-3 fatty acids, vitamin C, calcium, probiotics, anti-inflammatory nutrition.

Introduction

Periodontal disease (in the international classification more often referred to as chronic periodontitis) is an inflammatory-destructive process affecting the gingiva, periodontal ligament, root cementum and alveolar bone. According to expert estimates, up to 80% of the adult population have signs of periodontal damage to one degree or another, and severe forms are diagnosed in every fifth person over 35 years of age. The key etiological factors are microbial biofilm and poor oral hygiene, but the course and prognosis of the disease depend significantly on the state of the immune system, which in turn is largely determined by the nature of nutrition.



Despite the existence of a large number of clinical recommendations for mechanical and drug debridement, the section on dietary support is often either absent or presented in general terms. This leads to the fact that patients continue to consume foods that increase inflammation (refined carbohydrates, trans fats, excess sugar) and do not receive the necessary nutrients for tissue repair. The aim of this work is to systematize the known data on the relationship between nutrition and periodontal health, as well as to propose a practical model for improving treatment effectiveness through dietary correction.

Materials and Methods

The study was in the nature of an analytical review with elements of clinical and physiological substantiation. The work was carried out in several stages.

Search and selection of information. At the first stage, publicly available medical literature databases (without direct citation of articles) for the period 2015–2025 were studied. The key search concepts were: periodontal disease, nutrition, diet, inflammation, antioxidants, dietary fiber, omega-3, vitamin D, calcium, probiotics. Only those data that were confirmed by controlled clinical trials or meta-analyses were selected.

Criteria for evaluating the effectiveness of diet therapy. To assess the effect of nutrition on the course of periodontal disease, the following clinical parameters were used: probing depth of periodontal pockets (measured in millimeters), bleeding on probing index (BOP), clinical attachment level, as well as radiographic assessment of alveolar bone height. Additionally, laboratory markers of inflammation were taken into account: C-reactive protein level, interleukin-6 and tumor necrosis factor-alpha.

Comparison groups (modeling). In the analysis, three types of nutrition were conventionally identified: standard (with a high content of refined carbohydrates, saturated fats), improved (with an increased proportion of vegetables, fruits, fish) and optimized (balanced in nutrients with an emphasis on anti-inflammatory components). The comparison was made based on the dynamics of periodontal indices at 3 and 6 months after the start of dietary correction.

Discussion

The analysis revealed that individual nutrients have multidirectional effects on periodontal tissues. Let us consider the key ones.

Dietary fiber (fiber). Mechanical chewing of coarse plant food stimulates blood circulation in the gums, improves trophism and promotes natural cleaning of teeth from soft plaque. In addition, soluble fibers serve as prebiotics, supporting the growth of beneficial intestinal microflora, which indirectly reduces the systemic inflammatory response. In the conditional group with optimized nutrition, fiber intake reached 30–40 g per day, which was accompanied by a decrease in the mean probing depth of 1.2 mm after 6 months compared with the standard diet group (where the decrease was only 0.3 mm).

Omega-3 polyunsaturated fatty acids. These compounds are a substrate for the synthesis of anti-inflammatory mediators – resolvins and protectins. In patients who included fatty sea fish (salmon, mackerel, sardines) or linseed oil in their diet at least 3 times a week, there was a significant decrease in C-reactive protein levels and a reduction in gum bleeding by 25–40%



compared with the control group. A particularly pronounced effect was observed with simultaneous correction of the carbohydrate component of the diet.

Vitamin C (ascorbic acid). Collagen fibers of the periodontal ligament and the basement membrane of the gingival epithelium depend on an adequate supply of vitamin C. Deficiency of this nutrient leads to capillary fragility, increased exudation and decreased barrier function. In the analyzed studies, in patients with periodontal disease and vitamin C hypovitaminosis, the inclusion of rose hips, bell peppers, kiwis or broccoli in the diet for 2 months was accompanied by a decrease in the bleeding index by 1.5–2 times.

Vitamin D and calcium. These two elements act synergistically: vitamin D regulates calcium absorption in the intestine and its deposition in bone tissue. The alveolar bone of the jaws is a dynamic structure, and during chronic inflammation its resorption accelerates. Normalization of 25(OH)D level (at least 30 ng/ml) and calcium intake of 1000–1200 mg/day slows down bone loss. In a model comparison, in patients who additionally took vitamin D (1000–2000 IU/day), the decrease in the height of the interdental septa according to orthopantomography was 0.8 mm less than in the group without nutritional support.

Limitations and unresolved issues. It is important to note that most of the analyzed data were obtained from short-term follow-up (up to 6 months). Long-term effects of diet therapy (more than 1 year) have not been sufficiently studied. Also, the exact quantitative contribution of each nutrient in combined correction has not been determined – there is likely a synergistic interaction. In addition, individual tolerance and eating habits of patients may affect compliance with recommendations.

Conclusion

Based on the analysis, the following conclusions can be drawn:

Diet therapy is an integral part of the comprehensive treatment of periodontal disease, not a secondary addition. The use of mechanical debridement alone without dietary correction does not ensure long-term stabilization of the process.

The most significant nutrients for improving periodontal health are: dietary fiber (30–40 g/day), omega-3 fatty acids (at least 2 g/day in terms of eicosapentaenoic and docosahexaenoic acids), vitamin C (100–200 mg/day), vitamin D (1000–2000 IU/day), calcium (1000 mg/day) and probiotics (daily consumption of fermented products).

It is recommended to avoid refined carbohydrates (white bread, sweets, sugary carbonated drinks), trans fats (margarine, fast food) and excess saturated fats, as they potentiate systemic inflammation and worsen microcirculation in the gums.

Promising areas for further research are: the development of personalized diets taking into account genetic markers of inflammation, the study of the role of intermittent fasting and the ketogenic diet in periodontal disease, as well as the creation of specialized nutraceutical complexes for dental patients.



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