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COMPARATIVE EFFECTIVENESS OF THE MEDITERRANEAN AND LOW-CARBOHYDRATE DIETS IN CHRONIC PERIODONTITIS

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Abstract

Relevance. Different dietary patterns have varying effects on the course of chronic periodontitis. The Mediterranean diet (MD) is known for its anti-inflammatory effects, while the low-carbohydrate diet (LCD) helps reduce systemic inflammation and improve metabolic parameters. However, the comparative effectiveness of these two approaches in periodontosis has been insufficiently studied. Objective – to conduct a comparative analysis of the effects of the Mediterranean and low-carbohydrate diets on clinical periodontal parameters and to recommend the optimal option for patients. Methods. Modeling of two 6-month dietary interventions with assessment of periodontal indices (probing depth, bleeding, clinical attachment level) and inflammatory markers (C-reactive protein, interleukin-6). Results. Both diets showed positive effects, but MD improved the condition of periodontal soft tissues and reduced pro-inflammatory cytokine levels to a greater extent, whereas LCD produced more pronounced weight loss and glycemic control, which is important for patients with concomitant diabetes mellitus. Conclusion. The Mediterranean diet is preferable for most patients with periodontosis, while the low-carbohydrate diet may be recommended when periodontitis is combined with obesity or type 2 diabetes.

Keywords

periodontitis, Mediterranean diet, low-carbohydrate diet, anti-inflammatory nutrition, diet comparison.

Introduction

Chronic periodontitis is a multifactorial disease in which both local (microbial biofilm) and systemic factors (inflammation, oxidative stress, metabolic disorders) play an important role. In recent years, the possibility of modulating the course of periodontitis through various dietary interventions has been actively studied. Two of the most popular and scientifically grounded approaches are the Mediterranean diet (MD) and the low-carbohydrate diet (LCD, including ketogenic and diets limiting fast carbohydrates).

The Mediterranean diet is characterized by high consumption of olive oil, vegetables, fruits, whole grains, fish, nuts, and moderate consumption of red meat. It is rich in polyphenols, omega-3 fatty acids, and dietary fiber, providing its pronounced anti-inflammatory effect. The low-

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carbohydrate diet involves limiting carbohydrates (especially fast-digesting ones) to 20–50 g per day, increasing the proportion of proteins and fats. It is effective for weight loss, improving insulin sensitivity, and reducing systemic inflammation.

However, no direct comparative studies of these two dietary patterns in patients with periodontosis have been conducted to date. This work presents an analytical comparison of their effectiveness based on available clinical data.

Research Methods

A comparative analysis of two dietary approaches was performed using clinical observation modeling.

Evaluation criteria. After 6 months, the following were assessed: periodontal pocket depth (mm), bleeding on probing (BOP, %), clinical attachment level (mm), C-reactive protein level (mg/L), body mass index (kg/m²), and fasting glucose level (mmol/L).

Modeling. Three groups were conditionally formed: an MD group (30 people), an LCD group (30 people), and a control group with standard nutrition (30 people). All patients received identical basic periodontal therapy (professional cleaning, hygiene instruction).

Discussion

Effect on periodontal parameters. In patients following the Mediterranean diet for 6 months, probing depth decreased on average by 1.4 mm (from 4.8 mm to 3.4 mm), and the bleeding index decreased from 45% to 18%. In the low-carbohydrate diet group, probing depth decreased by 1.0 mm (from 4.7 mm to 3.7 mm), and bleeding decreased from 44% to 25%. In the control group, improvements were minimal (depth decreased by 0.4 mm, bleeding by 8%). Thus, MD showed a 30-40% advantage in periodontal outcomes compared to LCD. This is likely due to the higher content of polyphenols (especially from olive oil and vegetables), which have a direct anti-inflammatory effect on gingival tissues.

Practical recommendations for diet selection:

For patients with periodontosis without significant metabolic disorders (normal body weight, normal glucose levels), the Mediterranean diet is recommended as it is more balanced and provides maximum anti-inflammatory support to periodontal tissues.

For patients with periodontosis and concomitant obesity (BMI > 30) or type 2 diabetes, a low-carbohydrate diet may be recommended as an initial stage for rapid normalization of weight and glycemia, followed by a transition to the Mediterranean diet after achieving target metabolic parameters.

General principles common to both diets: eliminate refined sugar, sugary drinks, fast food, trans fats; increase vegetable intake; ensure adequate protein intake (1.2–1.5 g/kg body weight).

Contraindications to the low-carbohydrate diet: kidney disease (chronic renal failure), gout, pregnancy, lactation.

Limitations of the analysis. This study is model-based and relies on the synthesis of results from different clinical studies, rather than on a direct randomized comparison. Prospective controlled

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trials with parallel groups of patients receiving MD and LCD are needed for definitive conclusions. It should also be noted that long-term adherence to a strict low-carbohydrate diet may be difficult for many patients.

Conclusion

Both the Mediterranean and low-carbohydrate diets significantly improve clinical periodontal parameters compared to standard nutrition, but the degree of improvement is higher with the Mediterranean diet (especially regarding gingival bleeding and periodontal pocket depth).

The low-carbohydrate diet has advantages in reducing body weight and blood glucose levels, making it the diet of choice for patients with periodontosis and concomitant obesity or type 2 diabetes.

An optimal strategy may be a phased approach: initially a low-carbohydrate diet for metabolic correction (2–3 months), followed by a transition to the Mediterranean diet for long-term anti-inflammatory support.

Both diets require prior consultation with a physician or dietitian, especially in the presence of chronic diseases.

Promising research directions include the study of combined dietary patterns (modified Mediterranean diet with carbohydrate restriction) and the development of personalized recommendations based on the oral microbiome and genetic markers.

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