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Modern Approach to Non-Drug Treatment of Dyslipidemia

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Abstract: The role of nutrition in the development and progression of atherosclerosis is well known. Changing the dietary pattern in patients with dyslipidemia is of great importance, both as an independent intervention (in the group of patients with low and, partially, moderate cardiovascular risk), and as an adjunct to drug therapy in those at higher risk. This review describes the impact of modern methods of diet therapy, as well as the use of a number of nutraceutical agents from the point of view of evidence-based medicine.

Keywords: dyslipidemia, atherosclerosis, non-medicinal methods, therapeutic nutrition, Mediterranean diet, polyunsaturated fatty acids.

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Introduction

Cardiovascular diseases remain the leading cause of death in developed countries. Progress in the field of cardiology in recent years inspires optimism, but there are still areas that require more careful attention and, possibly, more thorough correction. We are talking about the role of nutrition and nutraceutical agents in the correction of cardiometabolic diseases of the Republic of Uzbekistan, in particular, atherogenic dyslipidemia. Atherogenic dyslipidemia plays a crucial role in the development and progression of CVD and is manifested in an increase in the level of total cholesterol, LDL cholesterol and a decrease in the anti-atherogenic fraction of HDL cholesterol [1]. There is a huge evidence base on the positive impact of lipid-lowering therapy, in particular, statin therapy, on the prevention of CVD. The benefits of statins have been demonstrated in both secondary prevention studies (4S, HPS, CARE, LIPID, LIPS,) and primary prevention studies (AFCAPS / TexCAPS, WOSCOPS, ASCOT-LLA, HPS, CARDS) [2, 3]. The evidence base for the use of non-drug methods of exposure is systematized to a much lesser extent than for drug therapy. This review is intended to analyze the accumulated experience to date. to provide an evidence base for the possibility of dietary effects on dyslipidemia. The factor of lifestyle changes, including the correction of dietary habits, attracts an increasing number of misconceptions that non-drug methods should accompany the use of lipid-lowering drugs [2, 4, 5]. Foreign recommendations for the diagnosis and correction of disorders of the National Society for the Study of Atherosclerosis (NOA) [6] leave opportunities for non-drug methods as the only therapeutic intervention (without prescribing lipid-lowering therapy) for patient management low-and moderate-risk individuals according to the SCORE scale (Table 1). Dietary habits influence cardiovascular risk through their effects on RF (BP, body weight, DM), as well as through a number of other (pleiotropic) effects. Thus, the primary goal of using non-drug goal is to correct other RF, such as obesity, DM, and hypertension [7-9]. Table 2 lists the methods of non-drug effects on various parameters of the lipid spectrum, as well as the level of evidence [6].Limiting saturated fat intake It is obvious that the greatest impact on dyslipidemia from a dietary point of view is the restriction (qualitative and quantitative) of the consumed fats. The main principles of healthy fat intake are: limiting the intake of saturated fat, sharply limiting (or rather completely eliminating) trans-fatty acids, and increasing the intake of long-chain polyunsaturated fatty acids (PUFAs), which reduce the level of plasma TG [10]. According to the updated dietary guidelines, saturated fat should be less than 10 % of the total calorie content, trans-fatty acids should not exceed 1 % of the diet. Salt intake should be limited to 5 g / day, while fiber intake should be increased to 30-45 g / day. It is recommended to consume at least 200 g of vegetables and 200 g of fruit per day. It is recommended to eat fish and seafood 1-2 times a week [11]. With regard to mineral intake, the need to increase potassium intake and reduce sodium intake should be emphasized. Total calorie intake should be calculated based on BMI and age-specific basal metabolic rate. With severe obesity, a decrease in body weight for every 10 kg is accompanied by a decrease in cholesterol LDL by 0.2 mmol / l [5].

DASH (Dietary Approaches to Stop Hypertension) The DASH (Dietary Approaches to Stop Hypertension) diet was developed in 1997 as part of a study on the effects of dietary modification on blood pressure. The main features of this type of diet are an emphasis on eating fruits, vegetables, low-fat dairy products, including whole grains, nuts and fish in the diet, reducing the consumption of saturated fat and red meat, as well as sugar-containing beverages. The main characteristics of the DASH diet are shown in Table 3 [12]. The DASH-Sodium trial sub-study evaluated, in addition, differences between groups with different sodium intakes: low – 1500 mg / day, medium – 2400 mg / day, high-3300 mg / day. The greatest effect on the degree

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of blood pressure reduction was achieved when the DASH diet was combined with a low sodium intake. In the lower sodium intake group, mean SBP was 7.1 mmHg lower in the non-BP group and 11.5 mmHg lower in the AH group [13]. Adherence to the DASH diet after 8 weeks caused a significant reduction in total cholesterol (-0.35 mmol / L), LDL (-0.28 mmol / L) and HDL (-0.09 mmol / L) without significant reduction in the level of cholesterol. effects on the level of TG. Moreover, more significant differences were observed in the male participants of the study [14]. At the same time, a cross-sectional study comparing the effects of the standard DASH diet and its modification with a reduced fat content (using low-fat dairy products) and a higher carbohydrate content (HF-DASH) showed a significant reduction in TG levels with the second diet option. The decrease in LDL, HDL, and apolipoprotein A-1 levels was more pronounced in the first group – the standard diet (with low-fat dairy products). Favorable impact on the level of BP was observed in both groups [15]. A meta-analysis of prospective studies of the effect of the DASH diet demonstrated its protective value in relation to a significant reduction in the risk of cardiovascular disease by 20 %, CHD by 21 %, stroke by 19 %, and the development of HF by 29 % [16].

Mediterranean diet Unlike the well-defined features of the DASH diet, there are no common approaches to standardizing the so-called Mediterranean diet. In general, this diet is characterized by an abundance of vegetables and fruits, whole grains, low-fat dairy products, fish, olive oil, moderate alcohol consumption, especially wine, and red meat restriction [17]. Compared to the DASH diet, the Mediterranean diet contains less dairy products and meat, more olive oil and seafood.. Example of a daily ration according to DASH Components Food Quantity Serving sizes Cereals 6-8 servings per day 1 piece of bread, 30 grams of cereals, ½ cup of ready-made rice, pasta or cereals Vegetables 4-5 servings per day 1 cup of raw leaves, ½ cup of sliced raw or cooked vegetables, ½ cup of vegetable juice Fruits 4-5 servings per day 1 medium fruit, ¼ cup of dried fruit, milk and dairy products 2-3 servings per day 1 cup of milk, 1 cup of yogurt, 45 grams of cheese Lean meat, poultry and fish 2 tablespoons peanut butter spoons or 15 grams of sunflower seeds, ½ cup dry beans or peas Fats and oils 2-3 servings per day 1 table. 1 tablespoon soft margarine. spoon soft margarine, 2 tablespoons. spoons of salad dressing, 1 teaspoon of vegetable oil Sweets and sugar 5 or less servings per week 1 table. spoon of sugar, 1 table. spoon of jelly or jam, ½ cup soft ice cream, 1 cup lemonade

REVIEWS of the marine diet on the risk of developing a number of noncommunicable diseases have demonstrated beneficial health effects in relation to conditions such as CVD, asthma, cancer, cognitive impairment, metabolic syndrome / insulin resistance, rheumatoid arthritis, and type 2 diabetes [18]. In addition, it has been shown to have a positive effect on reducing all-cause mortality [19, 20]. The PREDIMED (PrevencionconDietaMediterranea) study conducted in Spain demonstrated the benefits of the Mediterranean diet in relation to CVD prevention. For 2 years, participants One of the food options was followed: 1-with a restriction of the total amount of fat, 2 - with an additional introduction of olive oil, 3 - with an additional consumption of nuts. At the end of the study, there were no differences between the groups in terms of LDL cholesterol, but in terms of HDL and TG levels, a more favorable profile was found in the groups that additionally consumed nuts and olive oil. A meta-analysis of the effects of the Mediterranean diet on cardiovascular events showed the benefits of limiting saturated fat intake to 7 % of the daily caloric content or less [11, 12]. This data is In part, they contradict the results of the recently published study PURE (Prospective Urban and Rural Epidemiological Study) – this is one of the most famous projects of the Canadian Public Health Research Institute (PHRI). Participants from 18 countries were followed up for 7 years; during this period, 5,796 deaths and

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4,784 major cardiovascular events occurred [3]. Participants were divided into groups based on their level of macronutrient intake: carbohydrates, fats, and protein. Main output The conclusion of the study is that the predominance of carbohydrates in the diet (more than 60% of the total caloric content) is associated with an adverse effect on overall mortality, as well as on mortality from non-cardiac causes. In contrast, higher fat intake was associated with a lower risk of overall mortality, as well as the risk of stroke and MI. Such a negative effect of carbohydrates can be explained by an adverse effect on the lipid spectrum in the form of an increase in the level of TG, a decrease in the level of cardioprotective HDL cholesterol, an increase in the content of small proatherogenic LDL particles, as well as the risk of hypertension [4]. The authors of the study interpret the results with caution, as they partly disagree with the previously accepted guidelines on limiting fat intake. Most likely, we should not expect a review of clinical guidelines before conducting specially designed randomized controlled trials that confirm the primary results. Vegetarian diet The vegetarian nature of the diet involves the consumption of vegetables, fruits, cereals, whole grains. Depending on their attitude to the possibility of additional consumption of milk, eggs or fish, vegetarians are divided into vegans, who completely exclude animal products from the diet; lacto-vegetarians, who allow the consumption of milk and eggs, and pesco-vegetarians, who allow themselves seafood and fish. Randomized and observational studies have demonstrated the positive effects of vegetarian diets on LDL cholesterol, SBP and DBP, as well as body weight. Even short-term adherence to a vegetarian diet (for 4 weeks) resulted in a significant beneficial effect on the lipid spectrum, blood pressure, as well as the content of C-reactive protein (CRP), insulin, and glycated hemoglobin [15]. In the same study, a decrease in the need for medications, primarily antihypertensive, was demonstrated. Long-term adherence to vegetarianism according to a number of studies (up to 280 thousand participants) prevents the development of obesity, as well as coronary heart disease in comparison with a diet that included meat products. Stroke rate there was no difference between the groups [6]. Some studies, however, have also shown a decrease in the level of antiatherogenic HDL cholesterol [7]. The vegetarian nature of nutrition may be of interest from the point of view of environmental and economic feasibility, both directly – by eliminating expensive meat products, and indirectly – by reducing the dose of concomitant cardiologicaldrugs.Nutraceutical agents The most studied nutraceutical agents to date are polyphenols. According to one classification, all plant polyphenolic compounds It can be divided into hydrolyzable tannins (gallic acid esters with glucose and other sugars) and phenylpropanoids. Phenylpropanoids are the largest group of natural polyphenols with a variety of functions, including protection of plants from various pathogens, including insects, bacteria, fungi and viruses, as well as protection from ultraviolet radiation. Phenylpropanoids include several structurally different groups: glycosylated phenylpropanoids(phenylpropanoid glycosides), flavonoids, isoflavonoids, coumarins, stilbenoids, curcuminoids, and lignans [28]. They are in significant They are found in large amounts in plants, vegetables, fruit juices, and some beverages (tea, coffee, wine, and cola). There is evidence that polyphenolic compounds can have anti-inflammatory, antihistamine, antioxidant, decongestant, and antitumor effects on the human body, stabilize cell membranes, and inhibit aging processes [29]. In particular, at the cellular level, cocoa has been shown to influence the resistance of LDL cholesterol to oxidation, reduce platelet aggregation, and improve endothelial function [13]. There is evidence of the ability of some polyphenols reduce the production of TG, increase the level of anti-atherogenic HDL cholesterol, and also prevent the oxidation of LDL cholesterol [3]. In general, all nutraceutical agents for the correction of dyslipidemia can be divided into three groups according

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to their mechanism of action (Table 4): inhibitors of cholesterol absorption in the intestine, inhibitors of cholesterol synthesis in the liver, and agents that affect the excretion of LDL cholesterol [3]. However, it should be understood that this division is conditional, since most nutraceutical agents involve several different mechanisms. Much of the research on nutraceutical opportunities for primary care prevention was studied in a group of patients with elevated total CHOLESTEROL levels from 5.2 to 6.2 mmol / L. The potential positive effects of dietary and nutraceutical agents are the so-called pleiotropic effects, including effects on endothelial function and arterial wall stiffness, anti-inflammatory

Conclusion

1. All patients with dyslipidemia should be advised to reduce their intake of saturated fat due to its adverse effect on the risk of cardiovascular events due to its proatherogenic effect.
2. All patients, regardless of diseases, should strive to exclude trans-fatty acids due to the increased risk of developing premature atherosclerosis.
3. In the presence of overweight and obesity, it is necessary to limit the total caloric content of the diet (up to 2,000 kcal / day) to normalize body weight and reduce cardiovascular risk.
4. In the group of patients with moderate and low risk of CVD, the use of special nutraceutical agents and functional foods that affect the lipid spectrum may be promising, but requires further research.
5. The possibility of additional benefits from nutritional intervention in high-and very high-risk patients receiving statins or other lipid-lowering medications requires separate study.

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