

Role of vegan and vegetarian diets in type 2 diabetes

Siedlecka Dagna¹, Micał Wojciech², Krzewicka-Romaniuk Ewa¹, Pradiuch Anna¹

¹. Department of Pathophysiology, Medical University of Lublin, Lublin, Poland

². 1st Department of Medical Radiology, Medical University of Lublin, Lublin, Poland

KEY WORDS: type 2 diabetes, vegetarian diet, vegan diet, obesity, dietary factors

ABSTRACT

Significant benefits could be achieved in diabetes management with vegetarian and vegan diets. Many reports in literature indicate that both, vegetarian and vegan diet bring a potential benefits in a treatment of type 2 diabetes. What is more vegetarian and vegan diets have a positive effect on anti-atherogenic process. Observational studies indicate that risk of developing diabetes is reduced by half in people during a vegetarian diet, compared to non-vegetarian.

INTRODUCTION

Diabetes is a group of metabolic diseases characterized by hyperglycemia due to a defect of secretion or action of insulin. Chronic hyperglycemia in diabetes causes damage, dysfunction and failure of various organs, especially eyes, kidneys, nerves, heart and blood vessels.^[1,2] Diabetes is one of the most common chronic diseases and is a huge health and economic problem in many countries. It is called the first non-infectious epidemic in the world. Type 2 diabetes accounts for 90% of all diabetes cases. According to the World Health Organization (WHO) that 422 million people around the world suffer from diabetes, of which 180 million are people whose disease has not yet been diagnosed.^[3] It is expected that the number of people affected by diabetes is going to grow, increasing complications and healthcare costs. The aim of this review is to explore whether vegetarian and vegan diets lowers blood glucose levels, helps weight loss and reduces the risk of diabetes complications.

DIETARY TREATMENT

Dietary treatment of diabetes has been prescribed since ancient times. Views on nutrition of diabetic patients have changed along with a progress of knowledge about pathogenesis and pathophysiology of the disease.^[4] Nowadays dietary recommendations for people with diabetes include avoiding simple carbohydrates, limiting the intake of saturated and trans fats and cholesterol, preferring multiple smaller meals instead of large meals, eating more vegetables.^[5] These guidelines are individualized.^[6-9] They are based on medical condition, lifestyle, and food preferences. In type 2 diabetes, the primary task of the diet is not only to maintain good control metabolic disease, but also to reduce the patient's body weight.^[10] Weight control is extremely important for patients with diabetes because obesity is the main risk factor for type 2 diabetes and cardiovascular disease. Co-morbidity of obesity and type 2 diabetes is determined as diebesity.^[11-13] Many studies show that despite the weight loss and life style changes complete remission of the disease is not possible.^[8,14] Obesity and dietary factors play major roles in the risk of developing type 2 diabetes.^[15,16] The key of disease management are nutritional changes.^[17]

DIETS

Vegetarianism can be a solution to many health, ethical and ecological problems. People choose this type of diet for many reasons. Some do not want to harm animals, others are motivated by ideological or religious considerations. There are plenty types of vegetarian diets, for example^[18]:

- Pescatarian – doesn't eat any meat except for fish and seafood,
- Fruitarian – is a type of veganism (not vegetarianism), eats fruits, some seeds, nuts and vegetables, without eating animal products,
- Ovo Vegetarian,
- Lacto Vegetarian,
- Lacto-ovo vegetarian.

Type of Vegetarian	Meat	Eggs	Milk
Ovo Vegetarian	No	Yes	No
Lacto Vegetarian	No	No	Yes
Lacto-ovo Vegetarian	No	Yes	Yes

Table 1. Difference between Ovo-, Lacto-, Lacto-ovo Vegetarians.

Vegetarian diets tend to be low in fat, high in complex carbohydrates and dietary fiber. It reduces the risk of chronic constipation, colon cancer and hemorrhoids. Lower intake of simple sugars can protect against dental caries and periodontal diseases. It also protects against vitamin deficiencies, especially carotenoids, vitamin B₁, C, K, folate, magnesium, and potassium.^[19,20] It also has the opposite effect, reducing triglycerides level.^[5,21] The advantages, are that they reduce the risk of occurrence: hypertension, ischemic heart disease, obesity, type 2 diabetes, kidney stones.^[22-25]

Vegans exclude from the menu all products of animal origin: fish, eggs, butter, milk, gelatin. This way of nutrition may result in nutrient deficiencies, especially vitamin B₁₂, D and calcium.^[19,20] For diet it is essential to provide body with necessary nutrients to consider it as healthy. Incorrect use of vegetarian diet may negatively affect health. People must be conscious that this diet has not only advantages but also disadvantages. Improper use of a vegetarian diet may result in megaloblastic anemia, osteomalacia, neuropathy, menstrual disorders in young girls.

OBSERVATIONAL STUDIES:

Many clinical trials indicate benefits of vegetarian and low fat vegan diets in the treatment of diabetes. Nutrition sciences ensure that the use of a vegetarian diet combined with physical activity and elimination of stimulants allows to get rid of many symptoms resulting from diabetes. Well planned vegetarian diets can be nutritionally adequate.^[17] In randomized trials, they have been shown to improve glycemic control, blood lipid concentrations and body weight. In some instances there were more benefits than using conventional dietary guidelines.^[5] In Bernard et al. study, diabetes 2 patients were randomized to a conventional ADA (American Diabetes Association) diabetes diet or to a low-fat vegan diet. There was no significant differences between the two groups in weight loss; using both diets people lost weight. However greater improvements in plasma lipids, glycaemia were observed in the vegan group than in the conventional diet group.^[5] That has been recently confirmed in a different large multicenter study.^[26]

According to the Polish Diabetes Association, to avoid diabetes complications, the main goal of dietary treatment in diabetic patients is maintaining normal or close to the norm serum glucose level. Proper diet should provide all necessary nutrients, which allow to achieve optimal levels of lipids and lipoproteins, optimal blood pressure and prevent development of atherosclerosis and diabetic nephropathy.^[9]

CONCLUSION

Many scientific studies have shown that a vegetarian and vegan diet can protect against many chronic diseases. Benefits are suspected by observational and clinical trials. To confirm the effectiveness of vegetarian and vegan diets in diabetes management, larger clinical trials are needed. Also researchers agreed that the relationship between type 2 diabetes and obesity needs more in-depth analysis.^[27] Some questions remain unanswered. For example why not all obese patients develop diabetes? Proper nutrition not only prevents its development, but also helps the treatment, prevents the formation of early and chronic complications, may delay the entry of pharmacotherapy, and improves the comfort and quality of patients life.

It is important to educate patients to accept changes in the nutrition model and increase physical activity. Lack of basic knowledge about proper eating habits is a cause of frequent failure of treatment of obese people with diabetes.^[28,29]

ACKNOWLEDGEMENT: None

DISCLOSURE STATEMENT: The authors have no conflicts of interest to declare.

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