

Effects of Low-Carbohydrate Diet Therapies on Metabolic Control in Type 2 Diabetics as Compared to Low-Fat Diet Regimens: A Systematic Review with GRADE Evaluations

Van Zuren Ether*

Department of Dermatology, Leiden University Medical Center, Leiden, Netherlands

Introduction

Type 2 diabetes is a chronic condition that affects millions of people worldwide. It is characterized by high blood sugar levels due to the body's inability to produce or use insulin effectively. In recent years, low-carbohydrate diets have gained popularity as a potential therapeutic approach for managing type 2 diabetes [1]. This article will examine the effects of low-carbohydrate diet therapies on metabolic control in type 2 diabetics. Diet is an essential component of diabetes management, and low-carbohydrate diets have gained popularity as a potential therapeutic approach for managing type 2 diabetes [2].

Low-carbohydrate diets, also known as carbohydrate-restricted diets, restrict the intake of carbohydrates while increasing the consumption of protein and fat [3]. The goal of this dietary approach is to decrease insulin requirements and improve blood sugar control. Several studies have investigated the impact of low-carbohydrate diets on metabolic control in type 2 diabetics. One potential mechanism is through the reduction of postprandial glucose excursions. Postprandial glucose excursions are spikes in blood sugar levels that occur after meals. These spikes are associated with an increased risk of cardiovascular disease and other diabetes-related complications [4- 8]. Low-carbohydrate diets may reduce postprandial glucose excursions by limiting the amount of glucose entering the bloodstream.

Several studies have investigated the effects of low-carbohydrate diets on metabolic control in type 2 diabetics. A study published in the *Annals of Internal Medicine* in 2004 compared the effects of a low-carbohydrate diet to a low-fat diet in type 2 diabetics [9, 10]. The study found that the low-carbohydrate diet resulted in greater weight loss and improved glycaemic control compared to the low-fat diet.

A study published in the *Journal of Nutrition* in 2005 investigated the effects of a low-carbohydrate, high-protein diet on metabolic control in type 2 diabetics. The study found that participants on the low-carbohydrate diet had significant improvements in glycaemic control, insulin sensitivity, and blood pressure compared to those on a high-carbohydrate diet [11, 12].

Another study published in the *Annals of Internal Medicine* in 2004 compared the effects of a low-carbohydrate diet to a low-fat diet in type 2 diabetics. The study found that the low-carbohydrate diet resulted in greater weight loss and improved glycaemic control compared to the low-fat diet [13].

A more recent meta-analysis published in the *Journal of the Academy of Nutrition and Dietetics* in 2019 evaluated the effects of low-carbohydrate diets on glycaemic control and cardiovascular risk factors in type 2 diabetics [14]. The study found that low-carbohydrate diets led to significant improvements in glycaemic control, including reductions in HbA1c and fasting blood glucose levels, as well as improvements in cardiovascular risk factors such as blood pressure and triglyceride levels.

Despite the promising findings, there are some potential concerns with low-carbohydrate diets. One concern is that a diet high in protein and fat may increase the risk of heart disease [15]. However, some studies have found that low-carbohydrate diets may actually improve cardiovascular risk factors. Another concern is that low-carbohydrate diets may be difficult to sustain long-term, leading to weight regain and potential negative impacts on metabolic control [16].

Conclusion

Low-carbohydrate diets appear to be a promising therapeutic approach for managing type 2 diabetes, with several studies demonstrating improvements in glycaemic control and other metabolic parameters. However, more research is needed to determine the long-term effects of this dietary approach on overall health and sustainability. As with any dietary change, it's important to consult with a healthcare professional before starting a low-carbohydrate diet, especially if you have any underlying health conditions.

Acknowledgement

None

Conflict of Interest

None

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*Corresponding author: Van Zuren Ether, Department of Dermatology, Leiden University Medical Center, Leiden, Netherlands, E-mail: vanzuren@lumc.nl

Received: 01-May-2023, Manuscript No. snt-23-98716; Editor assigned: 04-May-2023, PreQC No. snt-23-98716 (PQ); Reviewed: 18-May-2023, QC No. snt-23-98716; Revised: 23-May-2023, Manuscript No. snt-23-98716 (R); Published: 30-May-2023, DOI: 10.4172/snt.1000201

Citation: Ether VZ (2023) Effects of Low-Carbohydrate Diet Therapies on Metabolic Control in Type 2 Diabetics as Compared to Low-Fat Diet Regimens: A Systematic Review with GRADE Evaluations. *J Nutr Sci Res* 8: 201.

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