Ketogenic Diet and Type 2 Diabetes

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Type 2 diabetes is a long-term condition where a person's blood sugar levels are high because their body either resists insulin or doesn't make enough of it. The main treatments for type 2 diabetes are medicine and lifestyle changes like exercise and weight loss. However, some studies have investigated the ketogenic diet as an alternative way to manage blood sugar levels and improve overall health. Below is some of the research in this area.

1. **Effect of low-calorie versus low-carbohydrate ketogenic diet in type 2 diabetes.**
   The goal of this study was to investigate the effects of a low-carbohydrate ketogenic diet (LCKD) compared to a conventional low-calorie diet (LCD) in improving glycemia in overweight and obese individuals, including those with type 2 diabetes.

   The study involved 363 participants who were overweight or obese, with 102 having type 2 diabetes. Participants were given the option to choose between the LCD or LCKD based on their personal preference.

   Various health parameters were measured before the dietary intervention and at intervals of 4, 8, 12, 16, 20, and 24 weeks afterward. Parameters included body weight, body mass index (BMI), blood glucose levels, changes in hemoglobin and glycosylated hemoglobin, total cholesterol, low-density lipoprotein cholesterol, (for the complete list please see the publication). In the LCKD group, some antidiabetic medications were initially reduced by half or discontinued, and dietary counseling and medication adjustments were performed biweekly.

   Both the LCD and LCKD showed positive effects on all the measured parameters. Notably, individuals following the LCKD experienced more significant improvements compared to those on the LCD.

   This study suggests that a ketogenic diet, specifically the LCKD, offers advantages over a conventional low-calorie diet in obese individuals with diabetes. The LCKD appears to enhance glycemic control, which may lead to lower blood glucose levels.

2. **The effect of periodic ketogenic diet on newly diagnosed overweight or obese patients with type 2 diabetes**
   This second study aimed to investigate the effects of a periodic ketogenic diet on overweight or obese patients newly diagnosed with T2DM.

   Sixty overweight or obese newly diagnosed T2DM patients were randomly divided into two groups: the Ketogenic diet (KD) group, and the control group, which followed a routine diabetes diet. Each dietary plan lasted for 12 weeks. During this period, changes in blood glucose, blood lipid levels, body weight, insulin levels, and uric acid levels were recorded before and after the intervention.

   In both groups, there were significant decreases in many physiological paramets which included , BMI (body mass index),triglyceride levels (TG), low-density lipoprotein cholesterol (LDL) , and glycosylated hemoglobin (HbA1c) (please see publication for the complete list) after the intervention ($P < 0.05$). However, the

decrease in these parameters was more pronounced in the KD group. It was observed that participants found it more challenging to adhere to the ketogenic diet over the long term compared to the routine diabetes diet.

In overweight or obese patients newly diagnosed with type 2 diabetes mellitus, a periodic ketogenic diet can effectively control body weight, as well as blood glucose and lipid levels. However, long-term adherence to the ketogenic diet appears to be challenging for some individuals.

3. **Effects of the Ketogenic Diet on Glycemic Control in Diabetic Patients: Meta-Analysis of Clinical Trials.** This review focused on analyzing existing literature and summarizing interventional trials that employed the ketogenic diet for glycemic control. The primary emphasis was on aggregating data related to key variables, such as weight, glycemic control, and lipid profile.

   The findings of this review indicate a significant positive effect of the ketogenic diet when compared to control groups in terms of three key aspects: weight reduction, glycemic control, and improved lipid profile. Notably, there was a favorable impact on glycated hemoglobin (HbA1c) levels and high-density lipoprotein (HDL) cholesterol levels among those following the ketogenic diet as opposed to control groups.

   Based on the results of this review, it can be concluded that the ketogenic diet outperforms control diets in terms of glycemic control and improvements in lipid profile. These findings are substantial enough to support the recommendation of the ketogenic diet as an adjunctive treatment for type two diabetes.

Following a ketogenic diet can provide many benefits and it is important to check with your healthcare practitioner prior to initiating any new health care regime or practice.

Practitioners trained by the Metabolic Terrain Institute of Health take a scientific approach to working with patients who wish to implement the ketogenic diet as a treatment option. It is essential to consult with a MATC Certified™ Practitioner to properly test, assess and address each patient before and during implementing a ketogenic diet intervention, or at the very least consult with a practitioner or health care provider familiar with your specific state of metabolic health.

1. Hussain TA, Mathew TC, Dashti AA, Asfar S, Al-Zaid N, Dashti HM. Effect of low-calorie versus low-carbohydrate ketogenic diet in type 2 diabetes. Nutrition. 2012 Oct;28(10):1016-21.
2. Li S, Lin G, Chen J, Chen Z, Xu F, Zhu F, Zhang J, Yuan S. The effect of periodic ketogenic diet on newly diagnosed overweight or obese patients with type 2 diabetes. BMC Endocr Disord. 2022 Feb 3;22(1):34.
3. Alarim RA, Alasmre FA, Alotaibi HA, Alshehri MA, Hussain SA. Effects of the Ketogenic Diet on Glycemic Control in Diabetic Patients: Meta-Analysis of Clinical Trials. Cureus. 2020 Oct 5;12(10):e10796.