



## **EFFECT OF THE KETOGENIC DIET ON GLYCEMIC CONTROL, INSULIN RESISTANCE, AND LIPID METABOLISM IN PATIENTS WITH T2DM: A SYSTEMATIC REVIEW AND META-ANALYSIS**

Yuan, X ; Wang, J ; Yang, S ; Gao, M ; Cao, L ; Li, X ; Hong, D ; Tian, S ; Sun, C  
Nutrition & diabetes. 2020;10(1):38

Expert review by [Daniel Quinones](#) DipCNM, MSc, mBANT, CNHC



Type 2 diabetes has become a worldwide health burden with a global prevalence of 300 million. Being overweight or obese has demonstrated to be a significant risk factor for the development of type 2 diabetes. The ketogenic diet which can be characterised by a diet of <55g of carbohydrates daily has demonstrated to be a beneficial intervention for weight loss and glycemic control suggesting potential utility for type 2 diabetics. This systematic review and meta-analysis compared the effects of a ketogenic diet on markers of glycemic control, lipid metabolism and body weight in type 2 diabetics pre and post intervention. There were a total of 13 studies and 567 subjects included in this meta-analysis. The findings conclude that type 2 diabetics following a ketogenic diet intervention ranging from 1-56 weeks experienced an average reduction of fasting blood glucose of 1.29mmol/l, HBA1c reduced by 1.07%, triglycerides decreased by 0.72 mmol/L , total cholesterol decreased by 0.33 mmol/L, LDL decreased by 0.05 mmol/L, HDL increased by 0.14 mmol/L, the average body weight decreased by 8.66 kg , waist circumference reduced by 9.17 cm and BMI reduced by 3.13 kg/m<sup>2</sup>.

**CLINICAL PRACTICE APPLICATIONS:** This meta-analysis demonstrates that a ketogenic diet may be a useful dietary intervention to improve glycemic control, lipid metabolism and body weight in Caucasian type 2 diabetics. Positive results were seen within as little as 1 week.

## **PRIMARY CARE-LED WEIGHT MANAGEMENT FOR REMISSION OF TYPE 2 DIABETES (DIRECT): AN OPEN-LABEL, CLUSTER-RANDOMISED TRIAL**

Lean, ME ; Leslie, WS ; Barnes, AC ; et al.  
Lancet (London, England). 2018;391(10120):541-551

Most individuals with type 2 diabetes are obese with accumulation of fat around the liver and pancreas. Many studies have demonstrated that dietary induced weight loss can improve type 2 diabetes, however none have assessed whether dietary weight loss can sustain type 2 diabetes remission. This 12-month randomised trial of 306 individuals with type 2 diabetes aimed to determine whether weight management led by doctors would achieve long-term remission of type 2 diabetes. The results showed that weight loss of 15kg or more resulted in significantly higher rates of type 2 diabetes remission after 12 months, with 48% of the weight loss group achieving remission compared to 4% of the individuals who were not assigned a weight loss regimen. It was concluded that nearly half of the participants who were on a dietary weight loss programme achieved type 2 diabetes remission and were able to stop their medications. This study could be used by healthcare professionals to understand that type 2 diabetes remission is a possibility with a supervised dietary weight loss programme.



## **THE PREVIEW INTERVENTION STUDY: RESULTS FROM A 3-YEAR RANDOMIZED 2 X 2 FACTORIAL MULTINATIONAL TRIAL INVESTIGATING THE ROLE OF PROTEIN, GLYCAEMIC INDEX AND PHYSICAL ACTIVITY FOR PREVENTION OF TYPE 2 DIABETES.**

Raben, A ; Vestentoft, PS ; Brand-Miller, J ; et al.  
Diabetes, obesity & metabolism. 2021;23(2):324-337

The main risk for the development of type 2 diabetes is being overweight or obese. Strategies to decrease weight are important to prevent its development or reverse disease. This long-term, randomised control trial of 2326 adults with prediabetes, aimed to compare the effectiveness of different maintenance diets, after initial weight loss; one which was high protein and low glycaemic index, and the other which was moderate protein and moderate glycaemic index. These diets were then combined with either moderate intensity or high intensity exercise.

The results showed that after 3 years, the incidence of type 2 diabetes was low and did not differ between the diet and exercise groups. However, more individuals achieved normal blood sugar levels when on a moderate protein diet combined with moderate exercise and when on a high protein diet combined with moderate exercise. The high protein diet with high intensity exercise was the least effective at maintaining normal blood sugar levels. The amount of weight lost was the same no matter what combination of diet and exercise. It was concluded that the incidence of type 2 diabetes was lower than expected with the diet and exercise regimes and did not differ between the diets. This study could be used by healthcare professionals to introduce a long-term protocol combining weight loss, healthy eating, and physical activity to pre diabetic individuals who want to reduce their chance of developing type 2 diabetes.



## **EFFECTS OF INTERMITTENT VERY-LOW CALORIE DIET ON GLYCEMIC CONTROL AND CARDIOVASCULAR RISK FACTORS IN OBESE PATIENTS WITH TYPE 2 DIABETES MELLITUS: A RANDOMIZED CONTROLLED TRIAL**

Umphonsathien, M ; Rattanasian, P ; Lokattachariya, S ; Suansawang, W ; Boonyasuppayakorn, K ; Khovidhunkit, W  
Journal of diabetes investigation. 2022;13(1):156-166

Various studies have shown that intermittent low-calorie diets are effective in reducing weight and improving glycaemic control. In this randomized controlled trial, two intermittent very-low calorie diets (2 days per week and 4 days per week) were evaluated against a control group with respect to achieving diabetes remission, improving glycemic control, metabolic parameters, and quality of life in Type 2 diabetic patients. There was a significant reduction in HbA1c and insulin resistance in the 2 days/week and 4 days/week intermittent very-low calorie groups at week 20. Both the intervention groups achieved diabetes remission with 29% of participants not requiring glucose-lowering medications at week 20.

Both intervention groups also showed a significant reduction in serum triglycerides, body weight, body mass index, and fat mass. Aspartate transaminase and alanine aminotransferase levels, as well as blood pressure, decreased significantly with a 4 day/week intermittent low-calorie diet. Both intervention groups experienced improved quality of life at week 10 and the interventions were generally well tolerated. To generalise the results, longer-term, robust studies are required. These results can help healthcare providers understand the clinical relevance of intermittent very-low calorie diets in managing Type 2 diabetes and obesity.

