

Effectiveness of a Hypocaloric and Low-Carbohydrate Diet on Visceral Adipose Tissue and Glycemic Control in Overweight and Obese Patients with Type 2 Diabetes

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Objective: To assess the efficacy of a hypocaloric low-carbohydrate diet in overweight and obese patients with type 2 diabetes.

Design: A Randomized Controlled Trial.

Setting: Istituto Santa Margherita, University of Pavia, Italy.

Method: Patients were enrolled based on the following criteria: both genders, age 30–85, Caucasian origin, BMI between 24.9 and 34.9 kg/m² (overweight and obese), glycated hemoglobin $\leq 7.5\%$, glomerular filtration rate ≥ 60 ml/min/1.73m² (CDK-EPI), on a free diet and only treated with metformin. Patients were evaluated before and after the intervention. They were randomly allocated to receive metformin with either a low-carbohydrate or a standard diet (control group) for 90 days. At the end of each dietary period, anthropometric and biochemical assessments, and Dual-energy X-ray absorptiometry (DXA) measurements were documented.

Result: Seventeen type 2 diabetic patients with an average age of 67 years and a BMI of 31 kg/m² were included in the study. Eleven (64%) were females and 6 (35.3%) were males. Patients on the low-carbohydrate diet showed reduced values of glycated hemoglobin (-0.43%; -5 mmol/mol; $P < 0, 05$) both within the treated group and the control group. The preliminary data showed maintenance of fat-free mass (FFM) (-0.24 kg; $p = 0.862$) a decrease in gynoid fat mass (FM) (-2.18 kg; $P < 0, 05$), with a decrease in visceral adipose tissue (-0.20 kg; $p = 0.108$).

Conclusion: A low-carbohydrate low-calorie diet has a short-term effect on the assessment of blood glucose and glycated hemoglobin values. It also shows promising results in the reduction of gynoid fat and visceral fat among type 2 diabetic patients.