

Low fat, low glycemic index ad libitum diet induces weight loss preserves lean body mass in obese healthy subjects. Results of a 24 week study

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Background: Obesity with its related diseases is one of the major health problems in Western countries. In the USA and Europe more than 40% of the population are overweight (1). The classical treatment of obesity, based on decreased caloric intake, has not been successful. Approximately two thirds of the people who lost weight usually regain it within one year's time, and almost all of them within a five year period (2). The underlying mechanisms of this dietary failure are various. One of the most important reasons for weight regain after a caloric restriction is the significant loss of lean body mass, leading to a decreased energy expenditure (3) and a decrease in fat oxidation (4). Reducing fat intake without caloric restriction has been the primary focus of many dietary interventions within the last twenty years. It could clearly be shown that this so-called low fat carbohydrate ad libitum diet is capable of inducing a significant weight loss. The results, however, are modest (5,6). There is also growing evidence of a beneficial effect of diets using low glycemic carbohydrate in treating obesity (7). Low glycemic index (GI) foods may favour weight loss by promoting fat oxidation at the expense of carbohydrate oxidation (7). The low GI diets may induce a higher satiety and, as a consequence, better compliance of patients (8). No trial has so far studied the combined long term effect of fat reduced and ad libitum low glycemic carbohydrate diet on weight loss, body composition changes and the compliance of patients.

Aim: The scope of the following study has been to investigate the long term effect of a low fat ad libitum low glycemic carbohydrate diet in obese non diabetic patients.

Subjects and Methods

Subjects: Generally healthy people (n=120 ; 66 females and 54 males; mean age (SD) 44 (9) years) who were determined to lose weight, were recruited from two obesity outpatient clinics. Before being entitled to take part in the study subjects were required to successfully pass a medical screening by a study physician. This included medical history and symptom evaluations, a physical examination including the measurement of height and weight, sitting blood pressure and pulse rate, an EKG and a laboratory evaluation. The inclusion criteria were ages from 18 to 65, body mass index 26 to 49 kg/m², willingness to lose weight and signing an informed consent. Exclusion criteria were use of any prescription medication, pregnancy or breast-feeding, any weight loss diet during the past 3 months.

Methods: Body weight was determined using a Rowenta® weight scale and height was measured to the nearest 0.5 cm using a stadiometer. Bioelectrical impedance and resistance measurement at 5/100/200 kHz were obtained using BIA instrument **Bodystat® Model QuadScan 4000** with current source electrodes, placed on the base of the fingers and toes.

Treatment: At the beginning the subjects were instructed by a dietician how to use a low glycemic diet. The subjects were given lists containing glycemic indices of carbohydrates sources (based on glucose-revolution brand-miller et al.). Probandes were supplied with low GI recipes. They additionally learned how to choose the low GI foods in restaurants. There was no limit in the amount of caloric intake. In order to reduce the fat intake the subjects received further information for modifying the fat-consume. Group meetings were held every two weeks for one hour. The group meetings consisted of dietary counselling, supportive counselling and sharing of food choices. Compliance with the diet was measured by self-report and food records. Weight and body composition were measured at baseline and after 24 weeks.

Statistics: Statistic analysis was done using Wilcoxon Signed Rank (StatView for Windows; SAS Institute Inc. Copyright © 1992-1998; Version 5.0.1). Results are considered significant when resulting p-Values were < 0,05.

Results: 109 (91%) patients (61 females and 48 males) finished the study; eleven subjects dropped out because they were unable to comply with the diet program. After 24 weeks an average weight loss 8,9 kg has been achieved.

Characteristic	Week 0	Week 24	P Value
Body mass index (kg/m ²)	33,4 ± 4,4	30,3 ± 4,1	< 0,0001
Lean body mass (kg)	56,1 ± 12,2	53,3 ± 12,1	< 0,0001
Fat mass (kg)	42,5 ± 10,9	36,4 ± 9,9	< 0,0001
Weight (kg)	98,6 ± 2,7	89,7 ± 19,6	< 0,0001

Mean ± SD

Discussion: In this 6 month uncontrolled study, low fat, low glycemic diet led to a significant reduction in body mass and fat mass whereas lean body mass-reduction was negligible. This diet seems to be a promising method for the treatment of obesity, though further long-term studies are still required.