

Parallel Session RTD Line 1 / Diet and weight (re)gain prevention

Lecture 6: Relationship between weight changes after weight loss and fatty acid composition of adipose tissue: the DIOGENES study

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Abstract

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Background:

Different protein content and glycemic index in the diet were tested for weight maintenance in obese subjects. Fatty acid composition of adipose tissue reflects change in fatty acid composition of dietary fat but also endogenous processing of fat (e.g. lipogenesis, selective lipolysis in adipose tissue). Relationship of weight changes after low calorie diet (LCD) with changes in fatty acid composition of adipose tissue triglycerides was evaluated in subjects undergoing weight maintenance diets with strictly controlled proportion of protein and glycemic index of food obtained in special supermarkets.

Methods:

87 adult subjects (weight 98.6 ± 15.6 kg, BMI 33.8 ± 4.1 kg/m², age 44.0 ± 5.4 yr) followed after an 8 week LCD period, strictly controlled weight maintenance diets for 6 months. Four diets were combination of higher or lower protein content and higher or lower glycaemic index, the fifth diet was control (healthy) diet. All diets were reduced in fat. Anthropometric parameters were examined and adipose tissue biopsies from the abdominal region were obtained before start of LCD, after LCD and after 6 months of weight maintenance. Fatty acid composition in adipose tissue was determined by gas chromatography.

Results:

The mean total weight loss was 9.4 ± 5.7 kg and BMI loss 3.2 ± 1.83 . During the weight maintenance period the mean weight gain was $+1.1 \pm 4.1$ kg, BMI change was $+0.4 \pm 1.4$ kg/m². Significant correlation was found between body weight change during the weight maintenance and change in proportion of saturated (SFA), monounsaturated (MFA), trans fatty acids and n-6 and n-3 polyunsaturated fatty acids (R squared 28.51, P=0.001). Significant positive correlation of change of BMI with change in SFA proportion (P<0.05) and significant negative correlation of weight and BMI change with change in MFA proportion (P <0.005) was shown.

Conclusion:

The results suggest that the effect of six month-weight maintenance diet are related to the change in fatty acid composition of adipose tissue; this change can be result of the difference in dietary fat composition and/or in individual metabolic processing.

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