

SELECTED NUTRIENTS IN ETIOLOGY, PREVENTION AND TREATMENT OF OBESITY

The 21st century pandemic of obesity is given by to the obesitogenic environment that helps to develop a positive energy balance, where the energy intake of an individual chronically exceeds his energy need, ie energy expenditure. There is an increase in body weight by increased or abnormal body fat accumulation in the body. Preventing the development of obesity is aimed at achieving energy balance, in the case of existing overweight or obesity, the treatment lies in inducing and maintaining a negative energy balance for some time, ie stimulating energy expenditure and reducing energy intake. Selected diet determines not only energy intake, but its individual nutrients can also partially affect energy expenditure and fat tissue physiology.

The aim of this work is to describe and experimentally verify some nutrients that could help in weight reduction and physiological function of adipose tissue. Based on the literature data, 19 active substances or mixtures were considered. A mixture of ω -3 polyunsaturated fatty acids (ω -3 PUFA), eicosapentaenoic acid and docosahexaenoic acid, in a daily dose of 0.6 g, in the form of fish oil in a certified food supplement was chosen as the most suitable for the experiment. In a 12-week, three-arm, parallel randomized clinical intervention study (UMIN Clinical Trials Registry - R000031131), groups of overweight women with and without daily addition of ω -3 PUFA were compared at the same controlled exercise and isocaloric diet. Both groups were compared to a control group without prescribed physical activity. The intervened group with ω -3 PUFA achieved a statistically significant ($p \leq 0.05$) reduction in body fat percentage as a body composition marker compared to control, the group without ω -3 PUFA did not have a statistically significant improvement versus control. In comparison, the two intervened groups achieved a statistically significant difference in the plasma adiponectin level parameter, where the ω -3 group achieved a significant increase in the level. The level of inflammatory interleukin 6 (IL 6) was significantly increased in the non- ω -3 PUFA supplementation group. Omega-3 PUFA are low in a common Czech diet. Our study suggests the appropriateness of using the ω -3 PUFA supplementation in our existing Czech nutritional conditions for the adjustment and normalization of nutritional status in combination with isocaloric diet and exercise according to current recommendations.