

How far will be a weight reduction successful depends on numerous factors. We focused on genetic, nutritional, hormonal and psychobehavioral factors which may significantly affect weight loss. Among nutritional factors a special attention was paid to the role of intakes of dietary calcium and n-3 polyunsaturated fatty acids (PUFA). In subsequent studies the predictors of weight reduction.

In a pilot study (study 1) the effects of dietary calcium intake in 208 overweight or obese subjects who underwent comprehensive weight management programme on weight loss were evaluated. The results of the pilot study showed that the weight loss significantly correlated with the changes in calcium intake – with increasing calcium intake higher weight loss was achieved.

In the second study we investigated the effect of various forms of calcium supplementation on anthropometric, biochemical, hormonal and psychobehavioral parameters in a cohort of 67 overweight or obese perimenopausal women. We did not find any effect of calcium intake on weight loss. However, groups with calcium supplementation exhibited smaller decline in fat-free mass (FFM) compared with the placebo group. Calcium supplemented groups also demonstrated significant reductions in hunger scores.

In the studies 3, 4 and 5 predictors of weight reduction were investigated. In the Study 3, eighty obese women underwent a comprehensive 12-month weight reduction programme which included daily administration of 10 mg of sibutramine. Predictors of weight loss at 12th month were baseline values of body mass index (BMI), depression score, restraint score and total energy intake. At 12th month only a change in disinhibition score remained significantly related to decrease in BMI.

In the Study 4, sixty seven women with overweight or obesity participated in a complex weight reduction programme in the Spa Lipova. Factors characterizing the eating behavior had no effect on the outcome of weight reduction programme. Baseline concentrations of growth hormone (GH), peptide YY₃₋₃₆ (PYY), neuropeptide Y (NPY) and C-reactive protein (CRP), along with age and BMI explained 49.8% of weight change variability in response to a short-term negative energy balance.

In the Study 5, we followed 24 overweight or obese women for 6 months. Initial BMI together with baseline values of dietary restraint scores and scores of disinhibition predicted weight reduction after 6 months. These parameters explained 60.8% of the variability in weight change. After six months, the changes in leptin and HDL cholesterol concentrations explained 42.2% variance in weight change.

In the Study 6, we investigated a frequency of neuromedin beta (NMB) P73T polymorphisms in groups of 37 males and 255 females with overweight or obesity and in normal weight subjects. We did not reveal any significant differences in the frequency of genotypes (PP, PT, TT) between a group of overweight/obese and group of normal weight subjects. Men non-carrying T allele exhibited higher energy, protein and fat

intakes and a higher hunger score at baseline compared with men who carried T allele. These men also demonstrated significant reductions in waist circumference, energy and carbohydrate intakes and in restraint and depression scores at the end of the study.

In the Study 7 the effects of n-3 PUFA supplementation on lipid profile and changes in the composition of fatty acids in serum phospholipids were examined in 40 obese women. The results show that a low-dose n-3 PUFA supplementation in yoghurt combined with a low calorie diet increased their concentration in serum lipids and prevented adverse changes in serum fatty acids composition after a short-term low calorie diet.

In the study 8 a relationship between the items of Eating Inventory (EI) and cardiometabolic risk factors was investigated in a cohort of 67 overweight/obese women before and after short-term weight reduction programme. An implementation of standard dietary and lifestyle pattern for 3 weeks revealed significant associations between the factors of EI and metabolic risks in overweight/obese women: The restraint score significantly negatively correlated with total cholesterol, fasting glucose, insulin, C-peptide (CP) and NPY. Hunger score was positively related to insulin, and NPY while disinhibition score correlated positively with total cholesterol, LDL cholesterol, triglycerides (TG) and NPY concentrations and negatively with adiponectin levels.

Two published review articles are attached. They constitute the basis of literary references for this thesis.