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Effect of Soy Protein Intake on High-fat induced Obesity and Insulin resistance

Nobuyo Tsunoda(角田伸代), Yuko Fujikane, Hyounju Kim(金 賢珠), Midori Ebata(江端みどり), Shinji Ikemoto(池本真二)

Department of Clinical Dietetics and Human Nutrition, Faculty of Pharmaceutical Sciences, Josai University, Saitama, 350-0295

High-fat diet feeding leads to obesity and insulin resistance. Recently, it was reported that sterol regulatory element-binding protein-1c (SREBP-1c) is involved in this mechanism of high-fat induced obesity and insulin resistance. SREBP-1c is an important factor regulating cholesterol and fatty acid metabolism. Some reports suggested soy protein (SPI) also has the effect of decreasing plasma cholesterol levels. Therefore, SPI may modulate the effect of high-fat on obesity and insulin resistance and/or SREBP-1c expression level. Furthermore, our previous study demonstrated levels of high-fat induced obesity and insulin resistance were different by types of oil. In this study, we investigated whether SPI intake modulates levels of obesity and insulin resistance induced by high-fat diets composed of three different oils (safflower oil, fish oil, palm oil). No significant different effects are on body weight, adipose tissue weight and glucose tolerance tests by SPI intake. But insulin tolerance tests deteriorated in mice fed high-safflower oil diets contained SPI (S-SPHF) compared with mice fed high-safflower oil diets contained casein (S-HF). S-SPHF-fed mice had high plasma glucose levels in feeding compared with S-HF-fed mice in stead of no difference of plasma insulin levels in feeding. These results indicate that S-SPHF-fed mice may reproduce insulin resistance caused of decreasing glucose intake into the peripheral tissues. Furthermore, we found that insulin resistance in S-SPHF-fed mice may be caused by decreasing glucose transporter 4 (GLUT4) mRNA in white adipose tissue. But it is remained to clear which tissues (skeletal muscle or adipose tissue or liver) relate to insulin resistance.