

1-A-13 Effects of a combined chronic intake of caffeine with exercise on body compositions, insulin and leptin resistances in the obese diabetic model rats -A study using radiographic CT scan apparatus-

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Purpose: The present study was performed to examine the effects of chronic use of caffeine and regular exercise as well as their combined effects on body composition, by using radiographic computed tomography (CT) scan apparatus, and examine the TG and glycogen (Gly) contents, which are indicators of insulin resistance, in the liver and skeletal muscle.

Methods: Other metabolic syndrome (MS)-related parameters such as body weight (BW), blood pressure (BP), fasting blood glucose (FBG), serum insulin, leptin, and lipid concentrations were also measured in the obese diabetic model of Otsuka Long-Evans Tokushima Fatty (OLETF) rats. The homeostasis model assessment of insulin resistance (HOMA-R) was calculated using FBG and insulin concentrations.

Results and Discussion: Combined chronic intake of caffeine with exercise showed the greatest total body fat and visceral fat mass reductions, the greatest lean body mass increases, and leptin and insulin resistance improvement, although these effects were found in the caffeine-only and exercise-only treatments.

Key Words: caffeine, computed tomography, hepatic and muscle TG, HOMA-R

1-A-14 The effects of voluntary exercise and restricted diet on glucose metabolism in Zucker Fatty Rats.

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Purpose: The purpose of the present study was to investigate whether glucose metabolism was improved by diet restricted and/or voluntary exercise in Zucker Fatty Rats.

Methods: Male Zucker Lean Rats were used as control group (L: n=8). Male Zucker Fatty Rats were divided into a obese (Ob: n=8), a restricted diet (DR: n=8), and a restricted diet + exercise (DR+Ex: n=8) groups. The L and Ob groups had free access to food. The DR and DR+Ex groups had food intake restricted to 67% and 70% of the Ob group level, respectively. The DR+Ex group was exercised voluntarily on the wheel ergometer with a load of 30% on their body weights. After 6 weeks all rats were prepared for experiment. Blood was collected and the liver was excised. Liver glycogen and serum insulin and glucose were measured.

Results: Zucker Fatty Rats ate a large number of food and became to have heavy body weight, hyperglycemia, and hyperinsulinemia. Body weights in the DR and the DR+Ex groups were significantly lower than in the Ob groups. Irregular boundaries of islets in the pancreas of the Ob group were observed. The DR+Ex group had improved islet morphology compared with the Ob group. Serum insulin and glucose in the DR+Ex group were significantly lower than in the Ob group. There were no significant differences in serum insulin and glucose levels between in the DR and Ob groups. Liver glycogen in the Ob, DR and DR+Ex groups were significantly higher than the L group.

Conclusion: Voluntary exercise may improve impaired glucose metabolism in Zucker Fatty Rats.

Key words: obesity, exercise, diet-restricted, Insulin, glycogen