1D04-2 Voluntary wheel-running exercise suppresses development of diabetic nephropathy
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Purpose: The aim of this study was to examine whether voluntary wheel-running (WR) exercise suppress development of diabetic nephropathy in a type 2 DM model rat OLETF. Methods: Five-week-old male OLETF rats were housed either in cages equipped with wheels (OLETF-WR) or in standard cages (OLETF-SED) for 16 months. These rats underwent urine collection in a metabolic cage and an examination for HbA1c and renal injury biomarkers. Results and Discussion: OLETF-SED with high HbA1c showed an increase in BUN, creatinine and urine volume per day, compared with OLETF-WR and LETO. In addition, OLETF-SED and OLETF-WR showed the highest and moderate levels in both Kidney/BW ratio and excretions of albumin and total protein into urine, respectively, while LETO the lowest levels. Nephron segment-specific biomarkers of renal injury revealed that OLETF-SED has injury in both glomerulus and proximal/distal tubules whereas OLETF-WR just only in glomerulus. Thus, long-term voluntary WR exercise could suppress diabetic nephropathy, but not fully.

Key words: OLETF, diabetes, exercise, renal failure

1D04-3 Effects of exercise intensity and style on acute decreases in blood glucose
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Purpose: In this study, we evaluated the effects of exercise intensity and style to develop an exercise prescription for reducing blood glucose.

Methods: In the aerobic exercise (AE) group, nine healthy men ingested a glucose solution; 30 min later, they exercised (aerobic exercise, 40–80% heart rate reserve) for 20 min. In the resistance training (RT) group, 10 healthy men ingested a glucose solution; 30 min later, they exercised (barbell squat, 40–80% one-repetition maximum, 10 times/set, three sets). Walking (4 km/h, 3 min) and stretching of the lower limbs (7 min) were performed by participants in both groups as a warm-up exercise. In the control (C) condition, after fasting blood glucose was measured, the participants ingested the glucose solution and then rested in a sitting position for 120 min, during which time the blood glucose was measured every 30 min. In the exercise conditions, in addition to the C condition time points, blood glucose was measured immediately after exercise and warm-up as well.

Results and Discussion: Elevated blood glucose by the ingestion of glucose solution was significantly lowered after exercise at all exercise intensities of both exercise styles. All glucose levels were significantly lower than in the C conditions, while an acute blood glucose lowering effect was observed in both exercise groups. In the AE group, there were no significant differences in blood glucose levels according to exercise intensity. No significant difference was observed between intensities other than between 80% and 40% in the RT group. This result suggests that exercise has an acute glucose lowering effect, regardless of style or intensity and that low-intensity exercise, irrespective of style, can be recommended to patients with diabetes as a way to help control blood glucose levels.

Key words: exercise intensity, exercise style, blood glucose