swimming training on serum free fatty acid (FFA) and the expression of peroxisome proliferator-activated receptor (PPAR-γ), carnitine palmitoyltransferase-I (CPT-I), medium-chain acyl-CoA dehydrogenase (MCAD) mRNA, to explore the mechanisms that why swimming training could improve insulin resistance.

Methods Twenty-six male ApoE knockout mice were randomly divided into groups: the high-fat diet group (HFD, n=13) and the high-fat diet group with exercise training (HFD+Ex, n=13). The HFD+Ex group were fed with high-fat diet with exercise training for 12 weeks. The treatment of HFD group was identical to the HFD+Ex group except to swimming training. And another ten healthy male C57BL/6 (ND, n=10) mice as the control group were, which were fed with normal diet for 12 weeks. After 12 weeks experiment, the mice were dissected, the livers were excised off immediately. Serum insulin, glucose were determined and Homa-IR was calculated to ascertain the establishment of insulin resistance. Serum total cholesterol (TC), triglyceride (TG), high-density lipoprotein cholesterol (HDL), low-density lipoprotein cholesterol (LDL), free fatty acid (FFA) were determined. The PPAR-γ, CPT-I, MCAD mRNA in liver were estimated by reverse transcription PCR (RT-PCR).

Results 1. There wasn’t any difference of the albuminuria incidence between patients less than 60-year-old and equal to or more than 60-year-old. The longer the hypertension exists, the higher the proportion of albuminuria. 2. The incidence of albuminuria associated with blood pressure levels significantly. The higher the blood pressure (BP) level, the more the urine protein excretion. The albuminuria detection rate in patients with normal blood pressure, high normal blood pressure, I, II or III stage hypertension were 26.3%, 27.5%, 28.7%, 51.5% and 40.5% respectively. 3. The incidence of albuminuria was different in patients with uncontrolled BP (BP=140/90 mm Hg) compared with those with well controlled BP (<140/90 mm Hg) (27% vs 30.2%, p<0.05). 4. The incidence of albuminuria was in obese patients compared with those with normal body weight at equal blood pressure level, but the difference wasn’t statistically significant. 5. Patients with albuminuria had more heart, cerebral or renal events than whom without proteinuria.

Conclusion The detection rate of proteinuria in hypertensive patients without known diabetes was 28.8% in China, among them the incidence of microalbuminuria was 18.6%, and the incidence of clinical albuminuria was 10.3%. Uncontrolled BP was important risk factor of proteinuria.