

**Results** Compared with Wistar-Kyoto rats (WKY), whole body and myocardial insulin sensitivity decreased in SHR as manifested by increased fasting blood glucose ( $6.24 \pm 0.21$  vs  $5.18 \pm 0.19$  mmol/l,  $n=6$ ,  $p<0.05$ ) and decreased insulin-induced cardiac function changes especially for  $\pm LVdp/dt_{max}$  respectively, which was partly attributable to decreased PPAR $\gamma$  expression in myocardium ( $0.72 \pm 0.08$  vs  $1.08 \pm 0.07$ ,  $n=4$ ,  $p<0.05$ ). Moreover, 9-week swimming training not only attenuated the fasting blood glucose ( $5.54 \pm 0.16$  vs  $6.24 \pm 0.21$  mmol/l,  $n=6$ ,  $p<0.05$ ) improved cardiac function and enhanced myocardial response to insulin in vivo in SHR, but also increased myocardial PPAR $\gamma$  and subsequent Akt expressions ( $1.18 \pm 0.12$  vs  $0.72 \pm 0.08$ ,  $n=4$ ,  $p<0.01$  and  $0.953 \pm 0.13$  vs  $0.514 \pm 0.14$ ,  $n=4$ ,  $p<0.05$ ) in SHR.

**Conclusions** These data demonstrate that 9-week swimming training increased myocardial PPAR $\gamma$  and subsequent Akt expressions in SHR, which is partly involved in improved myocardial insulin sensitivity. The present findings also indicate that the decreased PPAR $\gamma$  expression and subsequent phosphatidylinositol 3-kinase (PI-3 kinase)/Akt signalling perhaps plays a causative role in the impaired inotropic response to insulin in SHR heart. Thus, AE merges as an important choice in future SHR preclinical and clinic investigation.

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# LONG-TERM AEROBIC EXERCISE INCREASES MYOCARDIAL PPAR $\gamma$ EXPRESSION IN SPONTANEOUSLY HYPERTENSIVE RATS

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**Objectives** It is well known that cardiac insulin resistance exists in spontaneously hypertensive rats (SHR), which is attributable to decreased peroxisome proliferator-activated receptor-gamma (PPAR $\gamma$ ) expression in myocardium. However, the effects of aerobic exercise (AE) on myocardial insulin sensitivity in SHR rats are largely unclear. Therefore, the present study aimed to determine the effects of 9-week swimming training on myocardial insulin sensitivity in SHR and the underlying mechanism, with the special focus on the role of exercise in myocardial PPAR $\gamma$  expression.

**Methods** 4-weeks-old SHR were randomly subjected to 9 weeks of either sedentary or freeloading swimming exercise (2 h/day, 5 d/week). Blood glucose, cardiac systolic/diastolic function and PPAR $\gamma$ , protein kinase B (Akt) expressions in myocardium were determined at the end of exercise.