

GW23-e0235

EXERCISE TRAINING IMPROVES ISCHAEMIC TOLERANCE OF THE SENESCENT HEART BY AMPK-AUTOPHAGY CASCADE

doi:10.1136/heartjnl-2012-302920a.134

¹Chunhu Gu, ²Lu Yu, ³Li Jiang, ⁴Heng Ma. ¹Department of Cardiovascular Surgery, Xijing Hospital, Fourth Military Medical University; ²Department of Pathology, Xijing Hospital, Fourth Military Medical University; ³Department of Plastics and Burn, Tangdu Hospital, Fourth Military Medical University; ⁴Department of Physiology, Fourth Military Medical University

Objectives Exercise promotes myocardial resistance to ischaemic injury. But the mechanisms underlying exercise induced anti-aged

cardioprotection are incompletely understood. Here, we report that swimming training (ST) modulation of AMPK dependent autophagy prevents ischaemic injury in aged heart.

Methods and Results— young (4 months) and aged (22 months) mice maintained 10-week free-loading exercise training (swimming 1 h/day, 5 days/week).

Results Exercise significantly promoted basal autophagy in aged heart, which was accompanied by AMPK activation and mammalian target of rapamycin (mTOR) inhibition. As thus, exercise training improve the tolerance of aged hearts to ischaemia/reperfusion (I/R) injury as evidenced by reduced infarct size and cardiomyocytes damage, ameliorated the recovery of LV function after ischaemia as well as improved cardiomyocyte contractile function under hypoxic condition. Exercise training also restores the energy in response to I/R and cardiomyocyte mitochondrial membrane potential (MMP). Additionally, exercise induced cardioprotective effect and cardiac autophagy upregulation were impaired in AMPK KD mice. Furthermore, hypoxia stress-induced cardiomyocytes death in aged heart was promoted by autophagy depression.

Conclusions Excitation AMPK-autophagic flux by exercise training in senescence may be attributed to enhance intrinsic myocardial resistance to myocardial ischaemic injury in aged individuals.