3-P2-10

Poster Sessions

Gender differences in the effect of spontaneous exercise on heart failure in DCM model mice

Masami Sugihara¹, Ryo Kakigi², Takashi Murayama³, Takashi Miida¹, Takashi Sakurai³, Sachio Morimoto⁴, Nagomi Kurebayashi³

¹Dept. Clin. Lab. and Med., Juntendo Univ., ²Fac. Mgmt. & Info. Sci., Josai Int. Univ., ³Dept. Pharmacol., Juntendo Univ., ⁴Dept. Health Sci. at Fukuoka, IUHW

Nowadays, exercise is regarded as one of therapies for heart failure (HF). However, the effects of exercise on patients with dilated cardiomyopathy (DCM) have not been established. A knock-in mouse model of human inherited DCM, TNNT2 Δ K210, shows similar characteristics to DCM patients. We have recently found that voluntary exercise significantly improves cardiac function in male DCM mice. In this study, we compared the effects of voluntary exercise on male and female DCM model mice.

The DCM mice showed enlarged heart and frequent sudden death with t_{1/2} of ~70 days. Male and female DCM mice started running with wheels at 1 month of age. The non-exercise controls of both genders were housed without wheels. After running for a month, mice were investigated with echocardiography. After sacrifice, weights of body, heart, lung, lower extremity muscles were measured. Gene expressions of HF- and arrhythmia-related genes in myocardium were quantified by qPCR analysis.

At 2 months of age, the ejection fraction (EF) were significantly improved in male exercise group ($33.4 \pm 8.0\%$ (n=8)) compared with male control group ($22.7 \pm 9.3\%$ (n=8)). However, in females, the EF of both groups did not differ significantly (exercise group: $30.7 \pm 6.4\%$ (n=7), control group: $25.0 \pm 11.1\%$ (n=7)). Reasons for the weaker effects (of voluntary exercise) in female will be discussed.