Voluntary wheel running may improve cardiac dysfunction in experimental mouse model of cancer-induced cachexia

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A rat model of cancer cachexia has recently been established by implantation of the human stomach cancer cell line, which shows similar symptoms observed in human patients. On the other hand, cardiovascular diseases in cancer patients with cachexia have become a great concern. Here we applied this cancer cachexia model to mice and evaluated symptoms of cachexia including cardiac functions. Moreover, we investigated effects of voluntary wheel running (VWR) on cachexia symptoms using this model.

85As² human stomach cancer cells were inoculated to male BALB/c nu/nu mice, which showed a symptomatic cachexia at 2 wks after cancer implantation. By 8 wks after implantation, severe cardiac atrophy was developed and left ventricular ejection fraction (LVEF) was markedly reduced. VWR starting from 2 to 6 wks after implantation significantly suppressed the severity of cachexia. Moreover, LVEF significantly increased in cachexia group with VWR, compared to cachexia group without VWR.

In our cachexia mouse model, voluntary exercise could improve cachexia-induced cardiac dysfunction as well as suppress a progress of cachexia itself, suggesting a possible therapeutic effect of exercise on heart failure induced by cancer cachexia.