An Inhibitory Effect of Voluntary Running in an Activity Wheel on Blood Pressure Increase in SHRSP.

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We studied an inhibitory effect of voluntary running in an activity wheel on blood pressure increase in SHRSP. Four-week-old SHRSP and WKY were kept in an activity wheel at night for 21 weeks. Distance of a rat's running was recorded every day and blood pressure and body weight were measured every week. At 25 weeks of age urine catecholamine content, heart weight, kidney weight and liver weight per body weight, and cross sectional areas of media of thoracic aorta and mesenteric artery were measured.

Distance of running was greatest at 4 weeks of age, then quickly decreasing in SHRSP. Blood pressure increase of SHRSP of running group was significantly reduced compared with that of SHRSP of non-running group after 15 weeks of age. Body weight was significantly decreased in running SHRSP than non-running SHRSP after 2 weeks from the beginning of running.

At 25 weeks of age, heart weight, kidney weight, urine noradrenalin content, and cross sectional area of thoracic aorta media were lower in running SHRSP than non-running SHRSP. Liver weight, urine dopamine and adrenalin contents, and cross sectional area of mesenteric artery medium were not significantly different between both groups. In WKY, distance of running was rather constant after 8 weeks of age. Blood pressure, body weight, heart weight, urine catecholamine content, and cross sectional area of aorta media were not significantly different between running and non-running groups. Kidney weight and liver weight were higher in running WKY than non-running WKY. Cross sectional area of mesenteric artery media was decreased in running WKY.

Voluntary running may reduce blood pressure increase by suppression of increased function of sympathetic nervous system in SHRSP. The reduction of blood pressure increase may cause the decrease of heart weight, kidney weight, and cross sectional area of thoracic aorta media.