

1-C-10 Effects of voluntary wheel running on trabecular bone architecture in old rats

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Purpose: The effects of voluntary running training on cancellous bone in old rats remain controversial. This study investigated the effects of wheel running training on the trabecular bone of old rats.

Methods: Sixteen 28-month-old Fischer 344 female rats were assigned to a voluntary wheel running training group (Tr), or a sedentary control group (Con). After 10-week intervention, the right and left tibiae of Tr, Con, and sedentary adult rats were obtained. They were demineralized in 0.1 M disodium ethylenediaminetetraacetic acid for 4 weeks at 4°C, dehydrated through a graded ethanol series, and then embedded in paraffin. Longitudinal sections (5-μm) were cut using a microtome. Specimens were stained with Azan or HE. Quantitative analysis was performed by microscopic observations using a digital microscope and image analysis software.

Results: Lower trabecular bone volume (BV/TV) was observed in old rats compared to adult rats. In the Tr rats, BV/TV, trabecular thickness and osteoid thickness were greater compared to that of Con rats. No significant differences in BV/TV and trabecular thickness in the Tr rats were observed compared with middle-aged normal rats.

Conclusion: These findings suggest that trabecular architecture were improved by voluntary running training in old rats.

Key words: histomorphometry, osteopenia

Granted by JSPS (22500611) and NUHW (H23B15)

1-C-11 Systolic blood pressure more markedly increases during first 1 km of walking even though walking intensity is lower than second and third 1 km

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Purpose: The purpose of this study was to compare systolic blood pressure (SBP) at 1-km mark of walking to 2- and 3-km mark. In addition, we investigated factors which associated with the increase in SBP during the first 1 km.

Methods:

Seventy two middle-aged and older humans participated in this study. We asked the participants to walk at fairly-hard speed and/or faster than usual speed. Blood pressure was measured during walking at 1.0, 2.0, and 3.0±0.2-km mark in triplicate by oscillometry. To establish which factors were independent predictors of the increase in SBP during first 1km, we performed stepwise regression analyses of walking protocol-, environment-, and physical characteristics-related factors.

Results and Discussion: SBP increased during walking compared to baseline. SBP at 1-km mark was higher than at 3-km mark. Mean walking speed and metabolic equivalent during first 1 km were lower compared to during second and third 1 km. The only variable that was entered for the increases in SBP during first 1 km was anteflexion from long sitting position. We concluded that SBP more markedly increases during first 1 km of walking even though the walking intensity is lower than second and third 1 km. More caution may be needed in humans with lower flexibility compared with higher flexibility.

Key Words: Systolic blood pressure, Flexibility, Walking