1-C-10  Amount and intensity of physical activity assessed with a triaxial accelerometer in relation to bone mineral density at femoral neck in postmenopausal Japanese women

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Purpose: Walking steps do not provide information on the intensity of the activities in daily living. On the other hand, acceleration reflects intensity of the activities. This cross-sectional study investigated the associations between physical activity (PA) using a triaxial accelerometer and BMD at femoral neck (FN-BMD) in postmenopausal Japanese women.

Methods: The subjects were 90 women with 10 years since menopause or more (69.2±6.3 years of age). None of the subjects showed any abnormality in bone metabolism. FN-BMD was measured by dual X-ray absorptiometry (QDR4500A, Hologic, USA). A triaxial accelerometer (EW-NK50, Panasonic Electric Works Co., Japan) was given to each subject. This instrument measured the number of steps per taken and converted acceleration into metabolic equivalents (METs). The product of intensity at 3 METs or more and hours was expressed in Ex (METs·h). The subjects were instructed to wear the accelerometer during waking hours for 7 consecutive days.

Results and Discussion: While there was no correlation between walking steps and FN-BMD, Ex was positively associated with FN-BMD (r=0.26, p<0.01). This positive effect of Ex on FN-BMD remained significant after adjustment for confounding factors. It is suggested that the intensity of PA is a significant determinant of FN-BMD in postmenopausal Japanese women. Key Words: Femoral neck BMD, Accelerometer, Postmenopausal women

2-A-1  Relationship between daily spontaneous running volume and brain monoamine levels in rats

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Purpose: In this study, we examined the effects of difference of daily spontaneous running distance on brain monoamine levels which have a crucial role for physiological and psychological benefits in rats.

Methods: Male rats were housed individually in cages with or without an attached running wheel and were randomly assigned to either physically active or sedentary conditions for 4 weeks. The rats were screened into high runner (HR) or low runner (LR) based on the calculated daily running distance. We assessed the levels of brain dopamine, serotonin, noradrenaline, and its metabolite using HPLC.

Results and Discussion: The brain serotonin levels in LR was significantly higher than that of HR in the five every regions except for striatum. In the striatum, the dopamine levels in HR were significantly higher than that in LR. The results of the present study showed that difference of daily spontaneous running distance influenced monoamine levels in several brain regions related to physiological and psychological benefits, and suggests that daily spontaneous exercise volume could be essential points to obtain beneficial effects of physical exercise efficiently.

Key Words: spontaneous running, monoamine, brain