

Relationship Between Leisure-Time Physical Activity and Whole Body Bone Mineral Density, Human Growth Hormone, and Leptin in Women

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The benefits of structured exercise on bone health have been well documented. However, less understood is the influence of leisure-time physical activity (LA) on BMD. **PURPOSE:** The purpose of this study was to examine the relationships between LA, whole body BMD, and serum levels of human growth hormone (HGH) and leptin. **METHODS:** One hundred two apparently healthy, premenopausal women (Mean \pm SD Age: 43.1 ± 4.5 y; BMI: 26.5 ± 5.2 kg/m²; body fat: 41.6 ± 7.9 %) participated in the study. Self-reported leisure-time physical activity was quantified as total minutes of moderate to vigorous activity and then participants were separated into tertiles. Whole body BMD was determined using dual energy x-ray absorptiometry (DEXA). Serum HGH, leptin, and insulin were determined by EIA. A MANCOVA was used to evaluate differences in BMD, HGH, leptin, and LA while controlling for BMI, percentage body fat, and insulin. A multiple regression model was created with BMD as the dependant variable and HGH, leptin, LA, lean body mass (LBM), and fat mass (FM) as independent variables. **RESULTS:** LA was significantly different between tertiles ($P < 0.001$). There was no significant difference between the tertiles for BMD, HGH, leptin, LBM, or FM ($P = 0.167$). Pearson correlation coefficient revealed a significant relationship between BMD and leptin ($r = 0.229$; $P = 0.021$), but not for HGH ($r = -0.062$; $P = 0.535$) or LA ($r = -0.023$; $P = 0.817$). Multiple regression indicated that FM had the greatest influence on BMD (beta = 0.336; $P = 0.002$). **CONCLUSION:** For these women, HGH and LA were not related to BMD and FM had the greatest influence on BMD. While mean LA was significantly different between tertiles, the nature of the activities engaged in by these women may have been insufficient to propagate differences in BMD.