

Association Between Blood Lead and Walking Speed in the National Health And Nutrition Examination Survey (NHANES)

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Background and Aims: Walking speed is increasingly used as a simple and reliable measure of motor function in older people.

Slower walking speed is associated with adverse health effects including falls, disability, admission to hospital and mortality.

Lead is a toxicant that has been shown to adversely affect human health, particularly the neurological and vascular systems. We explored the hypothesis that lead can adversely affect the motor system manifesting as slower walking speed.

Methods: We used US National Health and Nutritional Examination Survey (NHANES) cross-sectional data from 1999-2002.

The time to walk 20ft (walking speed) was measured among 1,795 men and 1,798 women 50 years of age and older. The

association with blood lead concentration (sex-specific quintiles) was assessed with linear regression separately in men and women, adjusting for age, education, ethnicity, alcohol use, smoking status, height and waist circumference.

Results: Mean blood lead was 3.26 (sd=2.79) ug/dl in men and 2.21 (sd=1.86) ug/dl in women. Mean walking speed was 3.27 ft/s (sd=0.76) in men and 3.15 ft/s (sd=0.82) in women. Among women, walking speed decreased steadily with increasing blood lead quintile. Women in the highest quintile of blood lead had a walking speed that was 0.107 ft/s slower (95% CI: -0.008, -0.206) than women in the lowest quintile. Walking speed was 0.032 ft/s slower (95% CI: -0.049, -0.015) per ug/dl of blood lead, the same as 1 year of age in these data. Among men, walking speed increased through quintile 4 of blood lead (0.14 ft/s faster [95% CI: 0.05, 0.24] than those in quintile 1), but quintile 5 was not different from quintile 1.

Conclusions: We found higher blood lead level to be associated with decreased walking speed in women. The pattern in men was less clear. A contribution of healthy-worker effect to the pattern in men cannot be ruled out.