

Abstract

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The association between physical activity in leisure time and leukocyte telomere length.

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BACKGROUND: Physical inactivity is an important risk factor for many aging-related diseases. Leukocyte telomere dynamics (telomere length and age-dependent attrition rate) are ostensibly a biological indicator of human aging. We therefore tested the hypothesis that physical activity level in leisure time (over the past 12 months) is associated with leukocyte telomere length (LTL) in normal healthy volunteers.

METHODS: We studied 2401 white twin volunteers, comprising 2152 women and 249 men, with questionnaires on physical activity level, smoking status, and socioeconomic status. Leukocyte telomere length was derived from the mean terminal restriction fragment length and adjusted for age and other potential confounders.

RESULTS: Leukocyte telomere length was positively associated with increasing physical activity level in leisure time ($P < .001$); this association remained significant after adjustment for age, sex, body mass index, smoking, socioeconomic status, and physical activity at work. The LTLs of the most active subjects were 200 nucleotides longer than those of the least active subjects (7.1 and 6.9 kilobases, respectively; $P = .006$). This finding was confirmed in a small group of twin pairs discordant for physical activity level (on average, the LTL of more active twins was 88 nucleotides longer than that of less active twins; $P = .03$).

CONCLUSIONS: A sedentary lifestyle (in addition to smoking, high body mass index, and low socioeconomic status) has an effect on LTL and may accelerate the aging process. This provides a powerful message that could be used by clinicians to promote the potentially antiaging effect of regular exercise.

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