10-year Weight Change and Biological Aging in a Random Sample of 3,059 U.S. Adults

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ABSTRACT

Telomeres play a key role in the protection of chromosomes. A good index of biological aging is the length of telomeres. Telomeres gradually shorten over time. Hence, they are strongly related to chronological age. Lifestyle is also an important factor influencing telomere length. **PURPOSE:** This investigation was designed to study the relationship between 10-yr weight change and leukocyte telomere length (LTL) in a large sample of 3,059 randomly selected U.S. adults, 35-70 years old. **METHODS:** NHANES (National Health and Nutrition Examination Survey) data were used with a cross-sectional design to determine the relationship between percent weight change and LTL. Percent weight change was calculated by subtracting baseline body weight 10-yrs earlier from current body weight and then dividing by the individual's baseline body weight. The quantitative polymerase chain reaction method was used to measure LTL relative to standard reference DNA (T/S ratio). Covariates included age, sex, race/ethnicity, year of assessment, economic status, intent to lose weight, BMI, smoking, total physical activity, and disease status, (i.e., having or not having diabetes, cardiovascular disease, and/or cancer). Multiple regression was used to determine the linear relationship between percent weight change and LTL. Potential mediating variables were controlled using partial correlation. Because women and men differed significantly in percent 10-yr weight change and also telomere length, the data were analyzed separately by sex. **RESULTS:** After adjusting for age, race, year of assessment, and economic status, the association between percent 10-yr weight change and LTL was significant in women (F=8.0, P=0.0085). Controlling for all the covariates weakened the relationship slightly (F=6.5, P=0.0163). With all the covariates controlled, for each 1 percentage point increase in weight over the 10-yrs, telomeres were 3.96 base pairs (bp) shorter, on average. Given each 1-yr increase in age was associated with telomeres that were 14.2 bp shorter in women, each 3.6 percentage point increase in weight over the 10-yrs was predictive of 1 yr greater biological aging. 10-yr weight change was not associated with LTL in men. **CONCLUSION:** 10-yr weight change is a significant predictor of biological aging in U.S. women, but not in men.