

Abstract

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Telomere Length Trajectory and Its Determinants in Persons with Coronary Artery Disease: Longitudinal Findings from the Heart and Soul Study.

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BACKGROUND: Leukocyte telomere length, an emerging marker of biological age, has been shown to predict cardiovascular morbidity and mortality. However, the natural history of telomere length in patients with coronary artery disease has not been studied. We sought to investigate the longitudinal trajectory of telomere length, and to identify the independent predictors of telomere shortening, in persons with coronary artery disease.

METHODOLOGY/ PRINCIPAL FINDINGS: In a prospective cohort study of 608 individuals with stable coronary artery disease, we measured leukocyte telomere length at baseline, and again after five years of follow-up. We used multivariable linear and logistic regression models to identify the independent predictors of leukocyte telomere trajectory. Baseline and follow-up telomere lengths were normally distributed. Mean telomere length decreased by 42 base pairs per year ($p < 0.001$). Three distinct telomere trajectories were observed: shortening in 45%, maintenance in 32%, and lengthening in 23% of participants. The most powerful predictor of telomere shortening was baseline telomere length (OR per SD increase = 7.6; 95% CI 5.5, 10.6). Other independent predictors of telomere shortening were age (OR per 10 years = 1.6; 95% CI 1.3, 2.1), male sex (OR = 2.4; 95% CI 1.3, 4.7), and waist-to-hip ratio (OR per 0.1 increase = 1.4; 95% CI 1.0, 2.0).

CONCLUSIONS/ SIGNIFICANCE: Leukocyte telomere length may increase as well as decrease in persons with coronary artery disease. Telomere length trajectory is powerfully influenced by baseline telomere length, possibly suggesting negative feedback regulation. Age, male sex, and abdominal obesity independently predict telomere shortening. The mechanisms and reversibility of telomeric aging in cardiovascular disease deserve further study.

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