

Leukocyte Telomere Length and Cardiovascular Disease in the Cardiovascular Health Study

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Abstract

The telomere length of replicating somatic cells is inversely correlated with age and has been reported to be associated cross-sectionally with cardiovascular disease (CVD). Leukocyte telomere length, as expressed by mean terminal restriction fragment (TRF) length, was measured in 419 randomly selected participants from the Cardiovascular Health Study, comprising a community-

dwelling cohort recruited in four US communities. The authors investigated associations between TRF length and selected measures of subclinical CVD/risk factors for CVD (data were collected at the 1992/1993 clinic visit) and incident CVD (ascertained through June 2002). In these participants (average age = 74.2 years (standard deviation, 5.2)), mean TRF length was 6.3 kilobase pairs (standard deviation, 0.62). Significant or borderline inverse associations were found between TRF length and diabetes, glucose, insulin, diastolic blood pressure, carotid intima-media thickness, and interleukin-6. Associations with body size and C-reactive protein were modified by gender and age, occurring only in men and in participants aged 73 years or younger. In younger (but not older) participants, each shortened kilobase pair of TRF corresponded with a threefold increased risk of myocardial infarction (hazard ratio = 3.08, 95% confidence interval: 1.22, 7.73) and stroke (hazard ratio = 3.22, 95% confidence interval: 1.29, 8.02). These results support the hypotheses that telomere attrition may be related to diseases of aging through mechanisms involving oxidative stress, inflammation, and progression to CVD.