

Abstract

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Cumulative inflammatory load is associated with short leukocyte telomere length in the Health, Aging and Body Composition Study.

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BACKGROUND: Leukocyte telomere length (LTL) is an emerging marker of biological age. Chronic inflammatory activity is commonly proposed as a promoter of biological aging in general, and of leukocyte telomere shortening in particular. In addition, senescent cells with critically short telomeres produce pro-inflammatory factors. However, in spite of the proposed causal links between inflammatory activity and LTL, there is little clinical evidence in support of their covariation and interaction.

METHODOLOGY/PRINCIPAL FINDINGS: To address this issue, we examined if individuals with high levels of the systemic inflammatory markers interleukin-6 (IL-6), tumor necrosis factor- α (TNF- α) and C-reactive protein (CRP) had increased odds for short LTL. Our sample included 1,962 high-functioning adults who participated in the Health, Aging and Body Composition Study (age range: 70-79 years). Logistic regression analyses indicated that individuals with high levels of either IL-6 or TNF- α had significantly higher odds for short LTL. Furthermore, individuals with high levels of both IL-6 and TNF- α had significantly higher odds for short LTL compared with those who had neither high (OR=0.52, CI=0.37-0.72), only IL-6 high (OR=0.57, CI=0.39-0.83) or only TNF- α high (OR=0.67, CI=0.46-0.99), adjusting for a wide variety of established risk factors and potential confounds. In contrast, CRP was not associated with LTL.

CONCLUSIONS/SIGNIFICANCE: Results suggest that cumulative inflammatory load, as indexed by the combination of high levels of IL-6 and TNF- α , is associated with increased odds for short LTL. In contrast, high levels of CRP were not accompanied by short LTL in this cohort of older adults. These data provide the first large-scale demonstration of links between inflammatory markers and LTL in an older population.

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