

Abstract

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Insulin resistance, oxidative stress, hypertension, and leukocyte telomere length in men from the Framingham Heart Study.

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OBJECTIVE: Insulin resistance and oxidative stress are associated with accelerated telomere attrition in leukocytes. Both are also implicated in the biology of aging and in aging-related disorders, including hypertension. We explored the relations of leukocyte telomere length, expressed by terminal restriction fragment (TRF) length, with insulin resistance, oxidative stress and hypertension.

METHODS: We measured leukocyte TRF length in 327 Caucasian men with a mean age of 62.2 years (range 40-89 years) from the Offspring cohort of the Framingham Heart Study.

RESULTS: TRF length was inversely correlated with age ($r = -0.41$, $P < 0.0001$) and age-adjusted TRF length was inversely correlated with the Homeostatic Model Assessment of Insulin Resistance (HOMA-IR) ($r = -0.16$, $P = 0.007$) and urinary 8-epi-PGF(2alpha) ($r = -0.16$, $P = 0.005$) - an index of systemic oxidative stress. Compared with their normotensive peers, hypertensive subjects exhibited shorter age-adjusted TRF length (hypertensives = 5.93 ± 0.042 kb, normotensives = 6.07 ± 0.040 kb, $P = 0.025$).

CONCLUSIONS: Collectively, these observations suggest that hypertension, increased insulin resistance and oxidative stress are associated with shorter leukocyte telomere length and that shorter leukocyte telomere length in hypertensives is largely due to insulin resistance.

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