

Abstract

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Telomere Length in Lymphocytes of Older South Australian Men May Be Inversely Associated with Plasma Homocysteine.

Bull CF, O'Callaghan NJ, Mayrhofer G, Fenech MF.

CSIRO Human Nutrition, Adelaide, South Australia., School of Molecular and Biomedical Science, University of Adelaide, South Australia.

BACKGROUND: Deficiencies in folate (FOL) and vitamin B12 (B12) result in increased chromosomal aberrations, a validated biomarker of cancer risk. Telomeres, the regions of DNA that cap the ends of each chromosome, are critical for maintaining chromosomal stability but the impact of micronutrients on telomere structure and function remains unclear.

OBJECTIVE: We hypothesized that telomere length maintenance might be compromised if the status of FOL and B12 was inadequate and plasma homocysteine (HCY) was increased. We investigated the relationship between telomere length in peripheral blood lymphocytes and plasma FOL, B12, and HCY status, and tested whether any such relationship was dependent on age, gender, body mass index, and common polymorphisms in folate metabolism genes.

METHODS: A single blood sample was collected from 43 younger (18-32 years) and 47 older (65-83 years) adults in South Australia. The younger cohort consisted of 18 males and 25 females, whereas the older group included 24 males and 23 females. Telomere length was determined in lymphocytes by flow cytometry.

RESULTS: Telomere length in the younger cohort was 11.52% greater than in the older cohort ($p = 0.015$). In the older cohort, telomere length in females was 12.5% greater than in males ($p = 0.028$). In older males, there was a significant inverse correlation between telomere length and HCY ($r = -0.57$, $p = 0.004$), but this effect was not observed in the younger cohort or in the older female group.

CONCLUSION: These results provide evidence that telomere length of lymphocytes in older men may be adversely affected by HCY in vivo.

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