Abstract

Current research attention is focused on promoting a healthy aging experience among the burgeoning elderly population. With an overall aim to study the relationship between telomere length (TL), a biomarker of aging, nutrition, and mortality, three distinct but ancillary studies were conducted, following the multiple paper dissertation format. The first and second study used data from the National Health and Nutrition Examination Survey (1999-2002). The first study examined cross-sectional rates of age-related TL change and evaluated variability in the rate by gender, chronic stress, and chronic diseases. Crude and adjusted linear regression models estimated the rate of decline in TL across 10-year age categories, and assessed variation in the decline rate by sex, chronic stress, and presence of chronic diseases. The population rate of decline in TL with age was significantly greater for certain age groups, males and those with high allostatic load and a history of comorbidities. Analyses by gender showed a fairly consistent, yet statistically non-significant, decline for males; however, a trough in the rate was observed for females in the age categories 20-29 years and 50-59 years. Further, among women, a significant inverse association was found between TL and parity, menopause, and age at menopause. The second study comprehensively examined the role of specific nutrients and a healthy eating index in attenuating or preserving TL. In multivariate linear regression models, using energy-adjusted nutrients, intake of potassium, Vitamin B2, and the overall healthy eating index score were positively associated with TL; thus, emphasis should probably be placed not on individual nutrients but rather the importance of overall healthy eating. The third study assessed the association of TL with survival and lifespan using data from the Zutphen (The Netherlands) and Cretan (Greece) Elderly Study (2000). Subjects were 328 elderly men with vital status followed-up until September 2015. Kaplan-Meier survival estimation showed negligible, not statistically significant, differences in all-cause or cardiovascular mortality between long and short TL groups. Univariate and multivariable Cox proportional hazard models assessed the association of TL with survival; longer TL was not associated with all-cause or cardiovascular mortality. In linear regression models, TL was not a significant predictor of age at death for all men combined or analyzed separately for the Zutphen and Cretan cohort, possibly due to a survivor effect. Findings from these three studies advance the understanding of the relationship of TL with health outcomes, nutrition, and mortality. Understanding telomere dynamics and epidemiology may provide new insights to promoting healthy aging.