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# A role of adolescent lifestyle habits in biological aging: a prospective twin study

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ABSTRACT:

Adolescence is a stage of fast growth and development. Exposures during puberty may have long-term effects on health in later life. In this study, we aimed to investigate the role of adolescent lifestyle in biological aging. Biological aging was assessed in young adulthood by four measures of epigenetic aging. Study participants were twin pairs (n=371) aged 21–25 years from the Finnish Twin Cohort. Blood-based DNA methylation (DNAm) was used to assess epigenetic aging by Horvath's clock, DNAm PhenoAge, DNAm GrimAge, and DunedinPoAm estimators. Adolescent lifestyle-related factors, including body mass index, leisure-time physical activity, smoking, and alcohol use were measured at ages of 12, 14, and 17 years. First, latent class analysis was conducted to identify patterns of lifestyle behaviors in adolescence. We identified six subgroups of participants with different lifestyle behavior patterns. Second, the mean differences across the subgroups in later biological aging were studied using the Bolck-Croon-Hagenaars (BCH) approach. The groups with the healthier lifestyle behaviors were biologically younger compared to the groups with unhealthy habits. However, the differences were observed only when DNAm GrimAge and DunedinPoAm estimators were used to assess biological aging. These findings suggest that adolescent lifestyle may associate with biological aging process. Of measures of epigenetic aging, DNAm GrimAge and DunedinPoAm estimators may capture adolescent lifestyle-induced changes in biological aging. We are currently extending our analysis to include ACE components. Our purpose is to investigate the genetic and environmental factors underlying the observed differences in biological aging between the subgroups.

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