Study links adverse childhood experiences with epigenetic age acceleration

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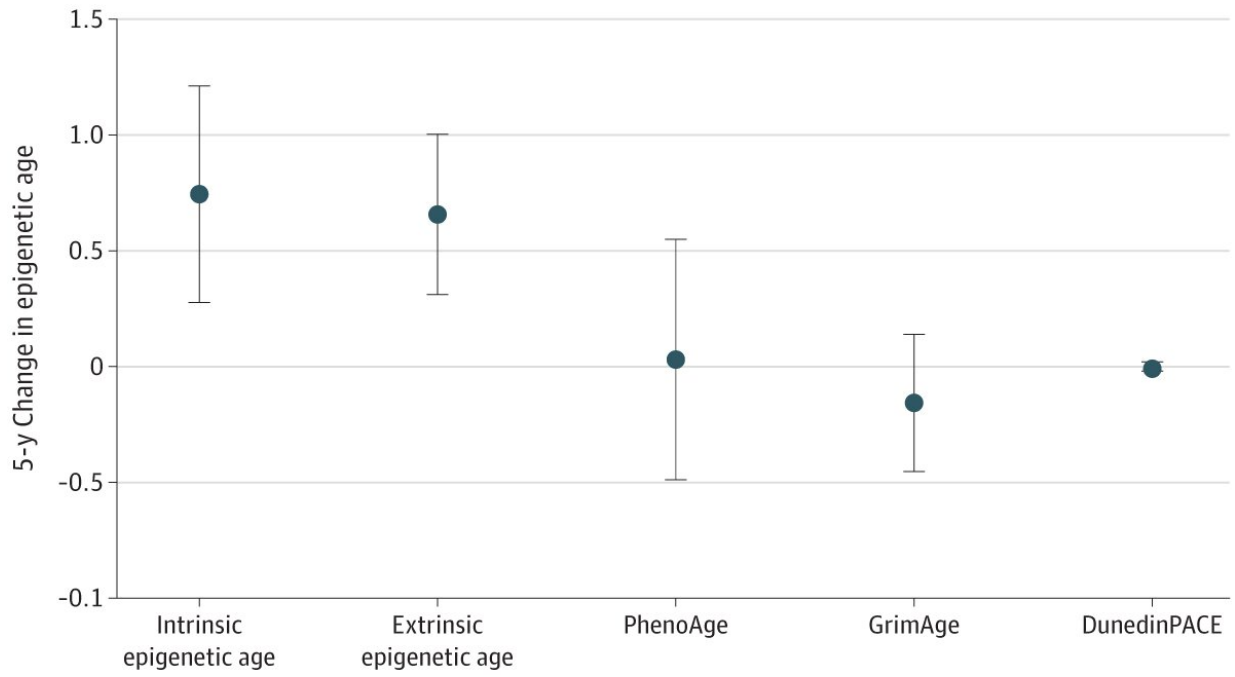

Associations between adverse childhood experiences and 5-year differences in epigenetic age. Models were adjusted for age, sex, race, body mass index, smoking status, physical activity, alcohol consumption, education, marital status, income, paternal occupation, and study center. Point estimates (β) represent mean differences in epigenetic age comparing participants with 4 or more vs. less than 4 adverse childhood experiences. DunedinPACE indicates Dunedin Pace of Aging Calculated From the Epigenome. Credit: *JAMA Network Open* (2023). DOI: 10.1001/jamanetworkopen.2023.17987

Research led by Northwestern University Feinberg School of Medicine, Chicago, has investigated associations of adverse childhood experiences with changes in epigenetic age acceleration.

In the paper, "Association of Adverse Childhood Experiences With Accelerated Epigenetic Aging in Midlife," published in *JAMA Network Open*, researchers utilized cohort data from a 30-year-long coronary study to confirm that various epigenetic age acceleration measurements are linked to adverse childhood experiences.

Adverse childhood experiences (ACEs) are broadly described as conditions of violence, abuse, neglect, undermined safety and household instability that most children experience at some point before turning 18. The adverse effects of ACEs accumulate in a dose-response fashion, with those experiencing more ACEs having more significant adverse health outcomes.

Researchers used data from the Coronary Artery Risk Development in Young Adults (CARDIA), a study initially designed to examine the factors contributing to cardiovascular disease development. CARDIA began with a baseline assessment in 1985 and conducted eight follow-up exams over 30 years. Two CARDIA follow-up time points were used in the analysis, year 15, which included an ACEs questionnaire, and year 20.

Five DNA methylation-based measurements associated with biological aging and long-term health were measured at Y15 and Y20. Epigenetic markers of participants with four or more ACEs were compared to those with less than four. Having four or more ACEs was consistently associated with various epigenetic age acceleration (EAA) measurements.

DNA methylation profiling showed participants with four or more ACEs

were likely to have older epigenetic ages than their chronological ages, independent of their socioeconomic status in early or later life. The results with multiple EAA measures suggest that ACEs may play a role in various epigenetic pathways that persist late in life and may be associated with preclinical conditions and overt diseases.

The data collected in the study also shows that the group with four or more ACEs were less likely to be married, more likely to be smokers, were less physically active and earned less income.

More information: Kyeezu Kim et al, Association of Adverse Childhood Experiences With Accelerated Epigenetic Aging in Midlife, *JAMA Network Open* (2023). DOI: 10.1001/jamanetworkopen.2023.17987

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