

Adolescent risk factors accelerate biological ageing at midlife

Smoking, obesity, and psychological disorders during adolescence are associated with older biological age at 45, a large cohort study has found.

Biological ageing is defined as a gradual physiological decline across multiple organ systems over time. Those who age more quickly are more likely to accumulate chronic disease, develop functional disability, and die prematurely.

The authors analysed data on participants in the Dunedin Study, a longitudinal investigation of health and behaviour of a cohort born between 1 April 1972 and 31 March 1973 in Dunedin, New Zealand.

Health assessments were conducted at birth and at regular intervals with the most recent at age 45 years.

Four measures of ageing were evaluated: pace of ageing, gait speed, brain age, and facial age. A composite score was calculated from the individual scores of each category.

The pace of ageing was measured with repeated assessments of a panel of 19 biomarkers taken at age 26, 32, 38, and 45 years. These included measures examining obesity and metabolic health, blood pressure, cardiorespiratory fitness, respiratory fitness, cholesterol and other blood parameters, as well as dental health.

Gait speed was measured at usual speed, walking fast and walking while concentrating on another task.

The BrainAGE algorithm was used to determine brain age. Facial age was evaluated from photographs.

Four health factors: asthma, daily cigarette smoking, obesity, and

psychological disorders were evaluated at 11, 13 and 15 years.

Of the 1,037 original participants, 938 were alive and underwent assessment at age 45, and 910 (50.4% men) met the inclusion criteria for this analysis.

Participants who had smoked daily, were obese or had a psychological disorder diagnosis during adolescence were biologically older at midlife compared with participants without these factors.

- Smoked daily 0.61 SD units (95% CI: 0.43-0.79)

- Obesity 0.82 SD units (95% CI: 0.59-1.06)

- Psychological disorder diagnosis 0.43 SD units (95% CI: 0.29-0.56)

Adolescents with obesity had a faster pace of ageing, slower gait speed and older facial age at midlife than those who were not obese.

Similar findings were seen at midlife in adolescents with psychological disorders when compared with those without a psychological disorder.

Adolescents who smoked daily had a faster pace of ageing, slower gait speed and older facial age as well as older brain age compared with those who did not smoke daily.

Participants with asthma were not biologically older at midlife 0.02 SD units (95% CI: -0.14 to 0.19) compared with those without asthma.

These findings remained unchanged after adjusting for childhood risk factors such as poor health, socioeconomic status, and adverse experiences.

The study authors conclude: 'The findings of this cohort study suggest that daily smoking, obesity and/or a psychological disorder diagnosis during adolescence are associated with accelerated ageing at midlife.'

Addressing these factors could prevent the accumulation of chronic disease, development of disability, and risk of early death in adulthood by reducing the risk of accelerated biological ageing, they argue.

DR PETER SAUL

Bourassa KJ, Moffitt, TE, Ambler A et al. Association of treatable health conditions during adolescence with accelerated aging at midlife. *JAMA Pediatr* 2022;176(4):392-99

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