In Older Adults Simple Biological Age Score Flags Higher Cognitive Decline Risk

A recent study published examined the relationship between light BioAge and the risk of cognitive impairment and cognitive decline in middle-aged and older adults, utilizing data from a large Chinese longitudinal cohort.

Study

Scientists assessed associations between light BioAge and cognitive outcomes using data from the China Health and Retirement Longitudinal Study (CHARLS), a nationally representative cohort of Chinese adults aged 45 and older spanning 2011–2020. CHARLS collected detailed information on health, socioeconomic status, and pension security.

CHARLS used a multistage, stratified, cluster-randomized design to recruit approximately 17,000 participants from 150 counties and 450 communities. Data included demographics, health status, physical activity, medical history, lifestyle, and laboratory values.

Light BioAge at baseline was the exposure variable. Baseline data were collected in 2011–2012, with follow-ups in 2013, 2015, 2018, and 2020. Only participants from 2011–2012 without baseline cognitive impairment or memory-related diseases, and with the data needed to calculate light BioAge and assess cognition during follow-up, were included.

The primary outcome was new-onset cognitive impairment during follow-up. Secondary outcomes included declines in mental intactness and episodic memory. Cognitive function was measured using a 0–31-point scale, with higher scores indicating better function. The assessment comprised two components: Episodic memory (0–20 points; immediate and delayed word recall) and mental state (0–11 points; orientation, calculation, and drawing tasks). Cognitive impairment was defined as a total score below 11, while declines in mental intactness or episodic memory were defined using changes from baseline, with difference scores below the lowest quartile classified as a decline. This survey-based definition of cognitive impairment was not equivalent to a clinical diagnosis of mild cognitive impairment or dementia.

Associations between light BioAge and cognitive decline were analyzed using Cox regression, adjusting for confounders. Subgroup, non-linear, and sensitivity analyses were also performed.

Findings

A total of 17,272 participants aged 45 years or older were included in the 2011-2012 CHARLS. After excluding individuals with baseline cognitive impairment, memory-related diseases, missing light BioAge data, or no cognitive assessment data during any of the four follow-up surveys, 4,818 participants were included in the analysis. During follow-up, 23.72% developed cognitive impairment, 40.70% showed a decline in mental intactness, and 35.14% experienced episodic memory decline.

Analysis revealed that higher light BioAge remained associated with increased risks of cognitive impairment, episodic memory decline, and reduced mental intactness after controlling for chronological age and other potential confounders. Because chronological age is itself a component of light BioAge, the authors cautioned that this should not be interpreted as an effect entirely independent of chronological age. Notably, individuals with light BioAge ≥56.82 years had substantially higher risks of cognitive impairment and episodic memory decline than those with light BioAge <42.45 years.

Sensitivity analyses supported these findings, indicating that higher light BioAge remained associated with poorer cognitive outcomes. No significant non-linear associations were found. Adding light BioAge to multivariable models produced small but statistically significant improvements in predictive performance across all three cognitive outcomes, while a separate analysis found that combining age with light BioAge better predicted cognitive impairment than age alone.

Exploratory subgroup analyses further suggested that the association between higher light BioAge and cognitive risks persisted across several demographic and health-related groups, although the patterns were not consistent across all subgroups. These results suggest that light BioAge may have potential as an epidemiological marker of cognitive risk, although its additional ability to distinguish individual risk appears modest.

Conclusion

The current study found that higher light BioAge is associated with increased risks of cognitive impairment, episodic memory decline, and reduced mental intactness among middle-aged and older adults.

Light BioAge provided modest additional predictive information, and for cognitive impairment, combining light BioAge with chronological age performed better than age alone. It may serve as a potential epidemiological marker for the early identification of cognitive impairment risk in this population. However, the study does not establish causality, and cognitive impairment was identified using survey-based cognitive testing rather than a clinical diagnosis.

The authors also noted potential selection bias from extensive participant exclusions and the need to validate the findings in other populations before light BioAge can be considered for routine clinical risk assessment.

Source:

https://www.news-medical.net/news/20260810/Simple-biological-age-score-flags-higher-cognitive-decline-risk-in-older-adults.aspx