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Epidemiology / Risk and protective factors in MCI and dementia

Early adult to midlife trajectory of inflammation and midlife cognition

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Abstract

Background: Late-life inflammation, often measured by peripheral biomarkers, has been linked to risk of developing dementia and preclinical cognitive decline. Little is known about early adulthood inflammation and if this could influence cognition earlier in life. Furthermore, few studies have investigated repeated measures of inflammation.

Method: We studied 1920 adults (mean age 33.3 ±3.5, 53% female, 62% white) who were enrolled in the Coronary Artery Risk Development in Young Adults study. We used latent class analysis to identify inflammation trajectories using repeated C-reactive protein (CRP) measurements (≥3 CRP assessments) over almost two decades. At midlife (mean age 55.4 ±3.5), we assessed cognition using the Digit Symbol Substitution Test (DSST), Stroop Test, Rey Auditory Verbal Learning Test, Montreal Cognitive Assessment, and fluency tests. Logistic regression was used to evaluate the association between inflammation trajectories and poor cognitive performance, defined as a score ≥1 standard deviation below the cohort mean for each test.

Result: Three early to mid-adult inflammation trajectories were identified: consistently low (34% [n=676]), moderate/increasing (15.0% [n=150]), and consistently high (51% [n=1094]). Those participants in the moderate/increasing or high trajectories had about a two-fold greater risk (adjusting for age, race, sex, and education) of poor cognitive performance on processing speed and executive function tasks compared to those in the consistently low trajectory. Further adjustment for physical activity, smoking, alcohol, hypertension and diabetes led to similar results (DSST: moderate/increasing OR=2.11 95%CI 1.22-3.65, high OR=1.52 95%CI 1.07-2.15; Stroop: high OR=1.68 95%CI 1.16-2.44). There were no differences by trajectory in odds of poor cognitive performance on memory or global cognition domains.

Conclusion: High or moderate/increasing early to mid-adult inflammation trajectory was associated with an almost 2-fold higher odds of worse executive function and processing speed in midlife. These findings suggest that inflammation is an important association for cognitive aging and may begin much earlier in life than previously known.