

ORIGINAL RESEARCH COMMUNICATION

Plasma folate concentration and cognitive performance: Rotterdam Scan Study^{1, 2, 3}

Lonneke ML de Lau, Helga Refsum, A David Smith, Carole Johnston and Monique MB Breteler

¹ From the Departments of Epidemiology and Biostatistics (LMLdL and MMBB) and Neurology (LMLdL), Erasmus Medical Center, Rotterdam, Netherlands; Department of Physiology, Anatomy, and Genetics, University of Oxford, Oxford, United Kingdom (HR, ADS, and CJ); and Department of Nutrition, Institute of Basic Biomedical Sciences, University of Oslo, Oslo, Norway (HR)

Background: Evidence is increasing for beneficial and independent effects of folate on cognitive function, but the underlying biologic mechanism is as yet unknown.

Objective: We examined the independent association of plasma folate concentration with cognitive performance and explored the nature of this association by evaluating brain-imaging markers for cerebrovascular disease and brain cell loss.

Design: In the population-based Rotterdam Scan Study, 1033 nondemented participants aged 60–90 y underwent extensive cognitive testing and brain imaging. We cross-sectionally examined the association between plasma folate concentration and cognitive test performance by multivariate linear regression. To evaluate the role of vascular or other mechanisms in this association, we subsequently studied whether plasma folate was related to the presence of white matter lesions and hippocampal and amygdalar volumes.

Results: After multivariate adjustment, the mean change in test score per 1-SD increase in plasma folate was 0.05 (95% CI: 0.01, 0.09) for global cognitive function, 0.08 (95% CI: 0.04, 0.13) for psychomotor speed, and 0.02 (95% CI: –0.04, 0.07) for memory function. Adjustment for homocysteine concentration only slightly diminished these associations. The odds ratio relating a 1-SD increase in plasma folate to the presence compared with the absence of severe white matter lesions was 0.79 (95% CI: 0.66, 0.94), whereas no relation was seen between folate status and hippocampal or amygdalar volume.

Conclusions: Higher plasma folate concentrations are associated with better global cognitive function and better performance on tests of psychomotor speed, regardless of homocysteine concentration. These associations may be mediated by vascular mechanisms.

Key Words: Folate • cognition • white matter lesions • epidemiology • cohort study

This article has been cited by other articles:



JAMA

[▶ HOME](#)

R. J. Clarke and D. A. Bennett
B Vitamins for Prevention of Cognitive Decline: Insufficient Evidence to Justify Treatment
JAMA, October 15, 2008; 300(15): 1819 - 1821.
[\[Full Text\]](#) [\[PDF\]](#)

This Article

- ▶ [Full Text](#)
- ▶ [Full Text \(PDF\)](#)
- ▶ [Purchase Article](#)
- ▶ [View Shopping Cart](#)
- ▶ [Alert me when this article is cited](#)
- ▶ [Alert me if a correction is posted](#)
- ▶ [Citation Map](#)

Services

- ▶ [Similar articles in this journal](#)
- ▶ [Similar articles in PubMed](#)
- ▶ [Alert me to new issues of the journal](#)
- ▶ [Download to citation manager](#)
- ▶ [© Get Permissions](#)

Citing Articles

- ▶ [Citing Articles via HighWire](#)
- ▶ [Citing Articles via Google Scholar](#)

Google Scholar

- ▶ [Articles by de Lau, L. M.](#)
- ▶ [Articles by Breteler, M. M.](#)
- ▶ [Search for Related Content](#)

PubMed

- ▶ [PubMed Citation](#)
- ▶ [Articles by de Lau, L. M.](#)
- ▶ [Articles by Breteler, M. M.](#)

Agricola

- ▶ [Articles by de Lau, L. M.](#)
- ▶ [Articles by Breteler, M. M.](#)

