

## Habitual nitrate intake and cognition in the Australian Imaging Biomarkers and Lifestyle study of ageing

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Mounting evidence suggests that dietary nitrate can improve cardiovascular health through its conversion to nitric oxide (NO). NO plays a significant role in both cardiovascular and brain health.<sup>(1)</sup> There is also a strong association between mid-life vascular risk factors and late life brain health.<sup>(2)</sup> Whether habitual dietary nitrate intake is associated with better cognitive function and a reduced risk of cognitive decline has yet to be investigated. The objective of the study was to investigate the association between habitual intake of dietary nitrate and 1) cognitive function and 2) cognitive decline, in the presence or absence of the APOE  $\epsilon$ 4 allele. The study included 1254 participants of the Australian Imaging and Biomarkers and Lifestyle study of ageing who were cognitively normal at baseline. Plant, vegetable, and total nitrate intakes were calculated from baseline food frequency questionnaires using comprehensive nitrate databases. Cognition was assessed at baseline and every 18 months over a follow-up period of 126 months using a comprehensive neuropsychological battery. Multivariable-adjusted linear mixed effect models were performed to examine the association between baseline nitrate intake and cognition over the period of 9 years stratified by APOE  $\epsilon$ 4 carrier status. In non APOE  $\epsilon$ 4 carriers, participants in the highest tertile of plant nitrate intake (median 116 mg/d) had a 0.13-unit higher language score (0.13 [0.01, 0.25]) compared with those in the lowest tertile (median 52 mg/d). In APOE  $\epsilon$ 4 carriers, participants in the highest tertile of plant nitrate intake (median 112 mg/d) had a higher episodic memory score (0.24 [0.01, 0.33]) compared with those in the lowest tertile (median 48 mg/d). Similar associations were seen for the intakes of vegetable-derived and total nitrate. We did not find any evidence of an association of dietary nitrate intake with rate of cognitive decline in this study. A higher habitual intake of dietary nitrate is associated with better language in non-APOE  $\epsilon$ 4 carriers and better episodic memory and recognition in APOE  $\epsilon$ 4 carriers.

### References

1. Stephan BCM, Harrison SL, Keage HAD, *et al.* (2017) *Curr Cardiol Rep* 19, 87.
2. Lane CA, Barnes J, Nicholas JM, *et al.* (2019) *JAMA Neurol* 77, 1–9.