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The association between selenium status and cognitive decline in very old adults: The Newcastle 85+ Study

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The trace element selenium is known to protect against oxidative damage which is known to contribute to cognitive impairment with ageing [1,2]. The aim of this study was to explore the association between selenium status (serum selenium and selenoprotein P (SELENOP)) and global cognitive performance at baseline and after 5 years in 85-year-olds living in the Northeast of England.

Serum selenium and SELENOP concentrations were measured at baseline by total reflection X-ray fluorescence (TXRF) and enzyme-linked immunosorbent assay (ELISA), respectively, in 757 participants from the Newcastle 85+ study. Global cognitive performance was assessed using the Standardized Mini-Mental State Examination (SMMSE) where scores ≤25 out of 30 indicated cognitive impairment. Logistic regressions explored the associations between selenium status and global cognition at baseline. Linear mixed models explored associations between selenium status and global cognition prospectively after 5 years. Covariates included sex, body mass index, physical activity, high sensitivity C-reactive protein, alcohol intake, self-rated health, medications and smoking status.

At baseline, in fully adjusted models, there was no increase in odds of cognitive impairment with serum selenium (OR 1.004, 95% CI 0.993-1.015, p = 0.512) or between SELENOP (OR 1.006, 95% CI 0.881-1.149, p = 0.930). Likewise, over 5 years, in fully adjusted models there was no association between serum selenium and cognitive impairment (β $7.20^{E-4} \pm 5.57^{E-4}$, p = 0.197), or between SELENOP and cognitive impairment (β $3.50^{E-3} \pm 6.85^{E-3}$, p = 0.610).

In this UK cohort of very old adults, serum selenium or SELENOP was not associated with cognitive impairment at baseline and 5 years. This was an unexpected finding despite SELENOP's key role in the brain and the observed associations in other studies. Further research is needed to explore the effect of selenium on global cognition in very old adults.

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