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Markers of vitamin B12 status in relation to CSF biomarkers and cognitive performance

Babak Hooshmand, Franziska Koch, Patrick Fissler, Hayrettin Tumani, Markus Otto, Miia Kivipelto, Christine von Arnim

Background: The association between markers of vitamin B12 status and cerebrospinal fluid (CSF) biomarkers of Alzheimer's disease (AD) which precede cognitive impairment has been investigated by only a few small studies and the results have been inconsistent.
Aim: To investigate the associations of B12 related markers with CSF total tau, Amyloid-β 42 (Aβ42) and cognitive performance.
Methods: Data included 462 patients aged 40-94 years referred to the Memory Clinic at the Ulm University Hospital, Ulm, Germany between December 2009 and August 2015. B12, holotrasncobalamin (HoloTC), methylmalonic acid (MMA), and homocysteine (tHcy) were assesswd in serum. CERAD battery was used to examine the cognitive status, and different domains were derived. Regression models were used to investigate the associations.
Results: After adjusting for age, sex, creatinine levels and *APOE*ε4 status, higher B12 and lower values of MMA were associated with lower concentrations of CSF total-tau: the odds ratios (ORs) (95% confidence intervals (CI)) in a logistic regression analysis investigating the associations with total tau cut-off of 400 pg/ml were 0.39 (0.15 - 0.99) and 5.60 (1.93 - 16.26) for the highest quartile of B12 and MMA compared to the lowest, respectively. Furthermore, HoloTC, MMA, and tHcy were associated with several cognitive domains such as episodic memory and executive functioning. No relationships were found with Aβ42.
Conclusions: B12 and its related markers may be independent predictors of CSF biomarkers of AD and cognitive status. Randomized controlled trials are needed to determine the importance of B12 supplementation on these outcomes.

Conflicts of interest

None