



## Meta-Analysis of Memory and Executive Dysfunctions in Relation to Vitamin D

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Titre Meta-Analysis of Memory and Executive Dysfunctions in Relation to Vitamin D

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Résumé en  
anglais

Background: Hypovitaminosis D is associated with global cognitive impairment in adults. It remains unclear which domain-specific cognitive functions are affected with hypovitaminosis D. Objective: To systematically review and quantitatively synthesize the association of serum 25-hydroxyvitamin D (25OHD) concentrations with episodic memory and executive functions in adults. Methods: A Medline and PsycINFO (R) libraries search was conducted on May 2012, with no limit of date, using the Medical Subject Headings (MeSH) terms "Vitamin D" OR "Hydroxycholecalciferols" combined with the MeSH terms "Memory" OR "Memory Disorders" OR "Executive Function" OR "Attention" OR "Cognition" OR "Cognition disorders" OR "Dementia" OR "Alzheimer disease" OR "Neuropsychological Tests". Fixed-effects meta-analysis was performed from 12 eligible studies using an inverse-variance method. Results: Of the 285 selected studies, 14 observational studies (including 3 prospective cohort studies) and 3 interventional studies met the selection criteria. All were of good quality. The number of participants ranged from 44-5,692 community-dwellers (0-100% women). In the pooled analysis, although episodic memory disorders showed only modest association with lower 25OHD concentrations (summary effect size of the difference (ES) = -0.09 [95% CI: -0.16; -0.03]), associations of greater magnitude were found with executive dysfunctions (processing speed: mean difference of Trail Making Test (TMT)-A score = 4.0 [95% CI: 1.20; 6.83]; mental shifting: mean difference of TMT-B score = 12.47 [95% CI: 6.78; 18.16]; information updating tests: ES = -0.31 [95% CI: -0.5; -0.09]). The pooled risk of incident decline of TMT-B score was OR = 1.25 [95% CI: 1.05; 1.48] in case of initial lower 25OHD concentrations. Vitamin D repletion resulted in improved executive functions (ES = -0.50 [95% CI: -0.69; -0.32] for before-and-after comparison), but exhibited no difference with control groups (ES = 0.14 [95% CI: -0.04; 0.32] for between-group comparison after intervention). Conclusion: Lower serum 25OHD concentrations predict executive dysfunctions, especially on mental shifting, information updating and processing speed. The association with episodic memory remains uncertain.

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