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Vitamin B₁₂ and folate status in patients with confirmed Alzheimer's disease

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Epidemiological studies are conflicting as to associations between vitamin B₁₂ and folate status with cognitive function and Alzheimer's disease in particular⁽¹⁾. This case-control study explores if vitamin B₁₂ and folate status are associated with Alzheimer's disease, and to examine if baseline vitamin B status predicts Alzheimer's disease progression in longitudinal follow-up of the case group.

Data for the case group were obtained from case notes of 130 Alzheimer's patients, aged 65 years and over, who had attended the Memory Service North, Grenoside Grange Hospital, Sheffield, between April 2007 and November 2009. Patients with known pernicious anaemia, gastric surgery, renal failure or any neurological conditions other than dementia were excluded. Patients receiving B vitamin supplements, or vitamin B₁₂ injections at or after baseline assessment were also excluded. Information on demographics, smoking and alcohol consumption, The Addenbrooke's Cognitive Examination Revised score (ACE-R)⁽²⁾, Mini Mental State Examination score (MMSE) at baseline and after 6 and 12 months⁽³⁾ and non-fasting plasma vitamin B₁₂ and folate status were collated. These data were compared with data from 340 cognitively healthy subjects aged 65 and over (control group), who had been recruited to a cross-sectional study of diet and vitamin B₁₂ status (Approved by Sheffield Research Ethics Committee on April 2008). Only subjects scoring over 27 in the MMSE test were eligible for inclusion as control subjects, and fasting morning samples were used to assess biomarker status. Ethics approval was granted by Sheffield Research Ethics Committee on October 2009. All statistical analysis was performed using SPSS (Version 16.0 for Windows).

Mean (SD) plasma vitamin B₁₂ and folate were found to be higher in the case group (278.50 (99.86) pmol/L, 22.67 (12.42) nmol/L, respectively) than in the control group (272.03 (91.11) pmol/L, 20.08 (12.25) nmol/L, respectively). However, the differences were not statistically significant ($p = 0.676$, $p = 0.066$, respectively). Correlation coefficients (Spearman) for changes in MMSE score from baseline to final assessment showed no significant association with baseline plasma vitamin B₁₂ and folate status in the case group. Multiple regression analysis showed that female gender ($\beta = 1.284$, 95% CI = 10.25–26.07, $p = 0.001$), body weight ($\beta = 0.574$, 95% CI = 0.25–0.70, $p = 0.001$) and alcohol intake ($\beta = 0.285$, 95% CI = 0.04–0.77, $p = 0.030$) were predictor variables of ACE-R score in Alzheimer's disease patients.

The findings of this study do not suggest any association between cognitive function and plasma vitamin B₁₂ and folate status. Gender, weight and alcohol intake were independent determinants associated with ACE-R score.

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2. Mioshi E, Dawson K, Mitchell J *et al.* (2006) *Int J Geriatr Psychiatry* **11**, 1078–1085.
3. Folstein M, Folstein S & McHugh P (1975) *J Psychiatr res* **12**, 189–198.