

HOMOCYSTEINE AND COGNITIVE IMPAIRMENT IN CHRONIC KIDNEY DISEASE

Y.-C. Yeh, M.-C. Kuo, S.-J. Hwang, S.-M. Hsiao, J.-C. Tsai, M.-F. Huang, C.-S. Chen

Kaohsiung Medical University Hospital, Kaohsiung Medical University, Kaohsiung, Taiwan R.O.C.

Objective Patients with chronic kidney disease (CKD) have more cognitive impairments. However, the etiologies are not fully clear. Plasma homocysteine levels and vascular burden rise in CKD; meanwhile, high homocysteine levels and vascular factors are known risk factors of dementia in non-CKD patients. Thus, we aimed to investigate the association between homocysteine, vascular burden and cognitive impairment in CKD and to see if the effect of elevated homocysteine on cognitive impairment mediated by vascular factor.

Methods 146 patients with CKD and 69 normal comparisons were recruited. Cognitive function was evaluated by comprehensive neuropsychological tests assessing processing speed, executive function, language, visuospatial function, memory, and attention domains. Vascular burden was assessed by Framingham cardiovascular risk scale (FCRS) which indicates risk of atherosclerotic diseases including stroke.

Results In controlled analysis, patients with CKD had lower scores in all cognitive domains, and had higher homocysteine levels (18.5 ± 6.4 vs. 9.8 ± 2.9 , $p < 0.0001$) and FCRS (17.0 ± 4.7 vs. 14.0 ± 4.7 , $p < 0.0001$). Among patients with CKD, higher homocysteine levels ($p = 0.026$) were associated with lower score on digit symbol task which is related to processing speed and executive function with controlling for age, sex, education and stage of CKD. The association persisted ($p = 0.047$) after controlling for vascular risks.

Conclusion Patients with CKD had extensive cognitive impairments. Elevated homocysteine levels may be an risk factor, which is independent of vascular burden, of cognitive impairment on processing speed and executive function. Further studies to investigate if normalization of homocysteine can improve cognitive function will be suggested.