Contribution of Chronic Kidney Disease to Cognitive Deficits and Cognitive Decline

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Chronic kidney disease (CKD) is a worldwide growing health problem that is found in 23-35% of adults ≥65 years. CKD is frequently associated with cognitive deficits and quality of life impairment. A major problem in CKD studies is the definition of normal cognitive performance, in which age- and education-matched control subjects or norm values from healthy subjects were used. Considering that CKD patients exhibit high loads of vascular risk factors and morbidities, which predispose to cognitive deficits, we performed a comprehensive analysis of factors predisposing to cognitive deficits and cognitive decline within the New Tools for the Prevention of Cardiovascular Disease in Chronic Kidney Disease (NTCVD) cohort. Notably, the degree of cognitive deficits in 119 CKD patients was moderate (z-score for global cognitive performance calculated as mean of 10 neuropsychological tests= -0.6±0.9) and remained surprisingly stable within 2 years of follow-up (change in z-score=0.1±0.5), when compared with 54 control patients without CKD with similar vascular risk profile (z-score for global cognitive performance=0.0±0.6; change in z-score=0.0±0.4). Age, HbA1c and fibrinogen were independent predictors for poor cognitive function in multivariable linear regression analyses. This observation suggests that disturbed glucose control and inflammation contribute to the development of cognitive deficits. Furthermore, in a smaller subcohort we showed that plasma levels of beta-amylloid were not associated with cognitive performance in a cross-sectional study, but predicted cognitive decline over 2 years follow-up. Our data support the hypothesis of a brain-kidney link that facilitates neurodegenerative processes.