Background and Purpose: Limited data exist regarding the relationship between chronic kidney disease and post-stroke cognitive impairment. We aimed to evaluate the relationship between impaired renal function, brain pathology and cognitive decline in a longitudinal post-stroke cohort.

Methods: The TABASCO study is a prospective cohort of mild-moderate ischemic stroke/TIA patients, who underwent a 3T MRI and were cognitively assessed at admission and 24 months following stroke. Renal function was evaluated at admission by creatinine clearance (CCl) equation. The volume and integrity of preexisting white matter hyperintensity (WMH), ischemic lesions and brain atrophy were measured.

Results: Baseline data were available for 431 subjects. Participants with a CCl < 60 ml/min performed significantly worse in all cognitive tests over time (p=0.001) than those with a CCl > 60 ml/min and had enlarged WMH volume, cortical atrophy and smaller hippocampal volume (all p<0.001). After 2-years, 15.5% of the participants developed cognitive impairment. Multiple logistic regression analysis controlling for traditional risk factors, including cardiovascular, showed a significant association of CCl < 60 ml/min at baseline with development of cognitive impairment at the end of follow-up [odds ratio: 2.01 (95% CI: 1.03–3.92), p = 0.041].

Conclusions: Decreased renal function is associated with increased WMH volume and cortical atrophy, known biomarkers of the aging brain, and is a predictor of lower performances in cognitive tests and cognitive decline 2 years after stroke/TIA. Decreased renal function may be associated with cerebral small vessel disease that underlies post-stroke cognitive decline, suggesting a new target for early intervention.