

SIGNIFICANCE STATEMENT

Recent data suggest that hemodialysis can reduce cerebral blood flow, and many assume—given the reported propensity of dialysis-related cognitive impairment to present as executive dysfunction—that alterations in cerebral circulation are implicated in cognitive decline. In this prospective observational study, using real-time vascular imaging (to measure cerebral blood flow) and neurocognitive assessments during a single dialysis session and after 12 months of ongoing treatment, the authors demonstrate a correlation between dialysis-related decrease in cerebral blood flow and measures of executive function. Brain imaging showed an increase in markers of small vessel disease in those remaining on dialysis. In transplanted patients, cerebral diffusion (and cognitive function) improved after transplant. These findings point to reduced cerebral blood flow as a mechanism of cerebral injury in hemodialysis.