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The Influence of Uremia, Fluid Removal, and Ischemic Injury on Cognitive Decline in ESRD

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Cognitive impairment is common and frequently marked in patients with end stage renal disease treated with dialysis, with prevalence rates of moderate cognitive impairment estimated at 30%–60%. Impairment of cognitive function in hemodialysis patients, which is associated with poor functional outcomes, increases the morbidity and mortality.
There are many factors that increase the risk of cognitive decline in hemodialysis patients. Traditional risk factors such as age, diabetes and hypertension cardiovascular disease are known to be associated with cognitive dysfunction. Accumulation of uremic toxins, such as metabolite, 4-hydroxyphenylacetate, and anemia due to renal impairment are also associated with cognitive decline.
Risk factors associated with hemodialysis include intradialytic hypotension leaded to cerebral atrophy, rapid fluid removal that can often lead to wide swings in blood pressure, and cerebral microbleeds that are related to the routine use of anticoagulants during the hemodialysis treatment.
In addition, depression contributes to impaired cognitive function. Depression, due to functional and psychological reasons, may also limit the ability to properly test for cognitive impairment.
Polypharmacy in hemodialysis patients can cause high risk of sedation, delirium, and cognitive impairment. Sleep disorders cause impaired daytime cognitive function.
This review focuses in the uremic toxins, fluid removal and cerebral hypoperfusion that can occur during maintenance hemodialysis.