



# Neurological Complications Associated with Hemodialysis

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Dear Editor,

We read the article entitled “Common Complications of Hemodialysis: A Clinical Review” on the esteemed “Ibnosina Journal of Medicine and Biomedical Sciences” with great interest. Habas et al reviewed the hemodialysis complications that frequently affect chronic kidney disease patients. They observed that cardiovascular system disorders and infections related to dialysis are the main causes of death in patients undergoing hemodialysis. Habas et al stated that renal transplantation should be offered to individuals at the early stages of end-stage renal disease to prevent the “legacy effects” of delayed treatment.<sup>1</sup>

Herein, we would like to discuss recent articles published about neurological complications associated with hemodialysis. The most common neurological manifestations that can be caused or worsened by dialysis are cognitive decline, central pontine myelinolysis, headache, neuropathy, stroke, myopathy, sleep disorders, restless legs syndrome, Wernicke’s encephalopathy, and autonomic dysfunction (→ Fig. 1).<sup>1–5</sup>

Cephalgia occurs in more than 70% of dialytic individuals. So, it can significantly affect the quality of life of patients with end-stage renal disease. Aoun et al assessed the incidence of headache and hypotension between patients drinking regular or decaffeinated coffee during dialysis. A total of 139 patients completed the trial, in which headache was diagnosed in 35% of patients. Apparently, caffeine intake did not prevent headache episode occurrence in these individuals. It is noteworthy that in a subgroup analysis, headaches tended to be more frequent in nonhypertensive patients with the highest potassium dialysate.<sup>2</sup>

Cheng et al systematically reviewed the literature of qualitative studies that report patient experience and per-

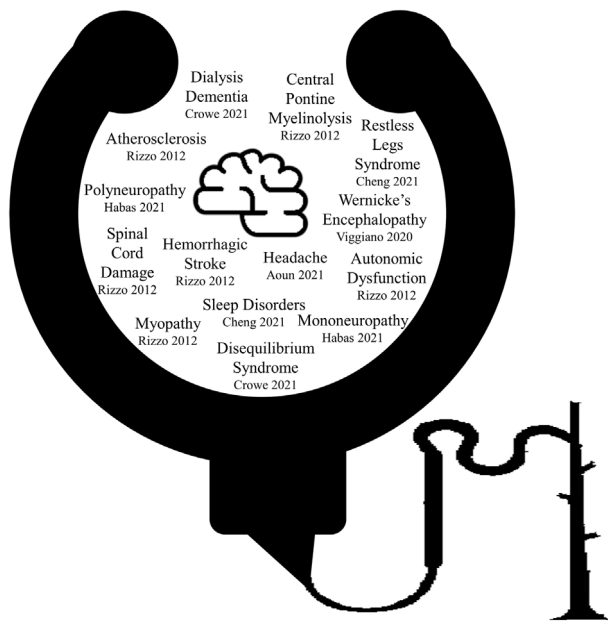
spectives on sleep in dialysis. They found that the most critical point related to sleep disruption is the unrelenting demands of treatment and the high symptom burden of renal failure. So, sleep problems are probably not directly associated with dialysis. Instead, they are related to the psychological stress surrounding this procedure. However, those with severe sleep symptoms should be referred to sleep specialists to review for further investigation and management.<sup>3</sup>

“Is cognition removed during dialysis?” It is a relevant question that has increased the discussion about dialysis-induced dementia in the last decades. In the middle of 1970s, it was observed that aluminum phosphate contamination was associated with cognitive decline so water purification techniques were developed. Cognitive impairment is independently associated with kidney disease and increases in prevalence with declining kidney function. Crowe et al revealed that this clinical feature is related to advanced vascular aging, mood disorders, sleep dysregulation, and the effect of dialysis itself. Therefore, it is believed that the recurrent intradialytic decline in cerebral blood flow could predispose to cerebral ischemic injuries leading to vascular dementia.<sup>4</sup>

Donaldson et al reported three cases and reviewed the literature about dialysis-associated nonarteritic ischemic optic neuropathy. This catastrophic consequence may occur secondary to intradialytic hypotension. The majority of individuals affected were middle-aged males with bilateral involvement in about 60%. It is worthy of mentioning that the prevention of intradialytic hypotension and its acute management remain the most important recommendations to avoid the development of complications.<sup>5</sup>

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**Fig. 1** Neurological complications associated with hemodialysis.

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None declared.

**References**

- 1 Habas EM, Habas A, Elgamal ME, et al. Common complications of hemodialysis: a clinical review. *Ibnosina J Med Biomed Sci* 2021; 13:161–172
- 2 Aoun MH, Hilal N, Beaini C, et al. Effects of caffeinated and decaffeinated coffee on hemodialysis-related headache (CoffeeHD): a randomized multicenter clinical trial. *J Ren Nutr* 2021;31(06):648–660
- 3 Cheng E, Evangelidis N, Guha C, et al. Patient experiences of sleep in dialysis: systematic review of qualitative studies. *Sleep Med* 2021;80:66–76
- 4 Crowe K, Quinn TJ, Mark PB, Findlay MD. “Is it removed during dialysis?”-cognitive dysfunction in advanced kidney failure-a review article *Front Neurol* 2021;12:787370
- 5 Donaldson L, Freund P, Aslahi R, Margolin E. Dialysis-associated nonarteritic anterior ischemic optic neuropathy: a case series and review. *J Neuroophthalmol* 2022;42(01):e116–e123