

Dissociative Symptoms in Dialysis: A Presentation of Suspected Dialysis Disequilibrium Syndrome/Delirium

Danielle Tran, BS, Amit Pradhan, MD, Joanna Kowalik, MD

Creighton University School of Medicine, Phoenix
Department of Psychiatry, Valleywise Health, Phoenix

Creighton
UNIVERSITY

Arizona Health
Education Alliance

INTRODUCTION

Dialysis disequilibrium syndrome (DDS) is a rare complication during or following dialysis due to fluid shifts, causing cerebral edema and a variety of neurological symptoms.

Symptoms may be mild and self-limited, including headache, restlessness, and confusion; in severe cases, symptoms may present as seizure, coma, or death.

In this case, we discuss a patient on dialysis presenting with episodic behavioral changes and dissociative symptoms after sessions, which was concerning for dialysis disequilibrium syndrome/delirium.

CASE PRESENTATION

HPI

43-year-old man with ESRD on dialysis, who was admitted for hyperkalemia, was evaluated by the psychiatry consult team for behavioral disturbances during dialysis sessions over the past year. The dialysis center had recently reduced his sessions from 3 days to 2 days per week due to agitation and combative behaviors, including spitting, screaming, offending staff, and pulling out his lines.

These episodes only occurred near the end or after his dialysis sessions. He reported “blacking out” during these episodes but remembered his actions afterwards and was apologetic. His wife reported occasional episodes lasting about 30 minutes after dialysis where he was confused and could not recognize her.

Psychiatric history

He was previously diagnosed with adjustment disorder after a behavioral event after a dialysis session last year. He endorsed a history of depression but denied any auditory or visual hallucinations. He also denied any history of seizures or mood fluctuations. He denies taking psychiatric medications, denies drug use except cannabis gummies for sleep.

He reported a previous suicide attempt after a dialysis session where he intentionally crashed his car into a wall. He saw blood on his body, believed he was dead and was a ghost. The following day, he realized he was in fact alive, and his car accident was not as extensive as he initially believed.

CASE PRESENTATION (CONT.)

Mental status exam

Alert; restricted affect; dysphoric mood; no delusions or hallucinations; coherent thought process; denies SI/HI

Differential diagnoses

Psychiatric condition due to another medical condition, such as a brain tumor or other intracranial process, seizures, or delirium vs. primary psychiatric condition, such as major depressive disorder with psychotic features

Additional workup and results

Neurology was consulted to rule out medical causes of his presentation, such as seizures or possible brain tumors. EEG and MRI were ordered and unremarkable. UDS was positive for cannabinoids.

Final diagnosis

Given his symptoms were intermittent, occurred towards the end or after dialysis sessions, and his neurological workup was negative, dialysis disequilibrium syndrome was suspected.

Interventions

His dialysis schedule was changed back to 3 days per week, and his sessions were reduced from 4 to 3 hours with improvement in his symptoms. However, after 3 months, he had two more incidents at the end of dialysis sessions, where he was reported to feel anxious and fidgety, and had an episode of attempted theft in the parking lot outside the dialysis center. He was then started on Haldol prior to dialysis and has continued his 3-hour sessions with behavior improvement thus far. Additionally, he has been engaging with Integrated Behavioral Health therapy.

DISCUSSION (CONT.)

Dialysis disequilibrium syndrome (DDS) is a cause of delirium in patients receiving dialysis. It is a diagnosis of exclusion. Two hypotheses have been proposed for the pathogenesis of DDS:

- 1) The reverse urea effect:** Urea naturally exhibits slower diffusion from the CNS into the blood compared to its rapid removal from the serum during dialysis. This disparity creates an osmotic gradient, resulting in water to shift into brain cells and leading to cerebral edema.
- 2) The idiogenic osmole hypothesis:** Idiogenic osmoles are generated by the brain during chronic hyperglycemia and hypernatremia to prevent the formation of an osmotic gradient and protect the brain from fluid losses. Rapid hemodialysis disrupts this equilibrium and creates an osmotic gradient that results in water to move into the brain and causes cerebral edema.

Treatment of DDS after it has developed includes modifying the dialysis prescription by changing the sodium dialysate bath or engaging the changed prescription on the dialysis machine.

Prevention of DDS includes avoiding significant osmotic gradients between the blood and brain during dialysis by reducing the clearance, increasing the time over which clearance is performed, and adding osmotically active agents as urea is removed.

CONCLUSION

DDS is important to identify in patients who present with confusion and other neurological symptoms on dialysis. Physicians should maintain a high degree of suspicion for DDS, although rare, as early recognition and implementation of prevention strategies can improve outcomes.

ACKNOWLEDGEMENTS

We would like to extend our sincere appreciation to Maher Mousa, MD at the Department of Nephrology at Valleywise Health for his guidance and expertise.

REFERENCES

- Bhandari B, Komanduri S. Dialysis disequilibrium syndrome. 2020.
- Zepeda-Orozco D, Quigley R. Dialysis disequilibrium syndrome. *Pediatric nephrology*. 2012;27:2205-2211.
- Mistry K. Dialysis disequilibrium syndrome prevention and management. *International journal of nephrology and renovascular disease*. 2019:69-77. (Figure reference)

DISCUSSION

