What are the ODS? A Case of Osmotic Demyelination Syndrome
Associated with Hemodialysis in End-Stage Renal Disease

Ellen Colleen Bradley, DO1; Yvette Wang, DO2

1Rowan University School of Osteopathic Medicine, Department of Medicine, Stratford, New Jersey;
2Jefferson Health of New Jersey, Department of Medicine, Washington Township, New Jersey

Introduction
- Osmotic demyelination syndrome (ODS) is the irreversible demyelination of the central pons, among other areas of the brain, that is most often associated with rapid correction of hyponatremia
- Divergently, reversible ODS is a rare state that can be seen in patients with end-stage renal disease (ESRD) on hemodialysis (HD)
- This clinical case offers an alternative problem representation for acute altered mental status in a patient with ESRD on HD

Case Presentation
- A 76-year-old African American female presented to the ED with new-onset aphasia and confusion
- Past medical history: ESRD on HD, diabetes mellitus, hypertension, hyperlipidemia
- Home medications: glipizide, insulin, amlodipine, metoprolol, and simvastatin
- Vitals: 195/86; all other vital signs stable
- At admission, the patient exhibited global aphasia and apraxia
- GCS=9 and NIHSS=14
- Aspirin 325mg was administered and treatment was started for suspected cerebral vascular accident (CVA)
- Further workup revealed no signs of infectious or autoimmune etiology
- Supportive treatment was given without antibiotics/steroids
- Blood pressure was kept normotensive
- Electrolytes were kept within normal limits
- Fluid shifts were minimized during HD
- The patient recovered to her neurologic and cognitive baseline by discharge six days later
- Aspirin was discontinued
- Follow up MRI brain was scheduled in three months

Neurological Imaging

![MRI images showing brain demyelination](image)

**Figure 1.** Left (A): MRI brain axial view showed diffuse increased T2 signal intensity within the brain, suggestive of demyelination; Right (B): MRI brain axial view shows multiple areas of T2 prolongation scattered throughout the periventricular and subcortical white matter of both cerebral hemispheres

Discussion
- ODS, more recently called central pontine myelinolysis, is most often caused by rapid correction of hyponatremia >10-12 mEq in 24 hours, but case reports have also shown ODS in patients undergoing dialysis1,2; these case reports correlate with our patient with global aphasia and apraxia
- The mechanism of action of ODS associated with HD is not well understood
- Treatment of this type of ODS consists of minimizing fluid shifts during HD and maintaining normotension
- The patient had three HD sessions in her hospital stay, two of which were filtration without fluid exchange
- Extensive workup was negative for other etiologies, and symptoms resolved without other intervention

Conclusion
- Although rare, HD-associated ODS should be considered in the problem representation of altered mental status in patients with ESRD in the right clinical context

Results

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<th>138</th>
<th>93</th>
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<th>156</th>
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<th>12.7</th>
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<td>3.9</td>
<td>52</td>
<td>1.9</td>
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- Sodium remained 135-141 throughout her hospital stay
- CT head, CT angiogram, and CT perfusion did not show acute intracranial ischemia or hemorrhage
- Recent outpatient labs were within normal limits
- EEG was negative for seizure
- Urine drug screen was not performed due to anuria
- Repeat MRI and MRA brain/head/neck was negative for CVA or reversible posterior leukoencephalopathy syndrome, but continued to show osmotic demyelination in the pons

References