Hyperactive Delirium in Heroin Toxic Leukoencephalopathy Complicated by Atypical NMS

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Introduction

Our institution serves North Philadelphia, specifically Kensington, noted to be the epicenter of the national opioid crisis and location in the city with the highest rates of opioid-related deaths. Heroin toxic leukoencephalopathy (HTLE) is rare cause of encephalopathy that warrants more attention to its diagnosis and management, as it is becoming increasingly more common in the wake of the opioid epidemic.

Objectives

This case presentation aims to emphasize the following learning objectives:

1. Review the neuropsychiatric features of this rare disorder
2. Identify system and patient factors that led to delay in appropriate diagnosis and management
3. Reflect on case-specific difficulties in medication management of agitation

Background

HTLE is caused by heroin use from smoking heroin products colloquially referred to as "chasing the dragon." While the exact mechanism of pathogenesis remains unclear, it is suspected to be caused by direct brain injury from toxic metabolites, resulting in spongiform degeneration. This syndrome is known to cause a range of neuropsychiatric manifestations that vary based on the extent of white matter damage.

Clinical Features:

➢ *Patient with a history of heroin use & acute/subacute neuropsychiatric symptoms*

1. Cerebellar, pyramidal, and extrapyramidal signs
2. Neurobehavioral changes (confusion, apathy, abulia, motor restlessness, personality & behavioral changes)
3. Mutism and/or incontinence, central pyrexia

Imaging:
Pathognomonic findings on T2/FLAIR MRI demonstrate diffuse, symmetric, white matter hyperintensities in a posterior-anterior gradient with frontal lobe sparing.

Management:
Largely supportive, with some empiric evidence of antioxidant therapy using coenzyme Q10, vitamin E, and vitamin C.[1]

Case Summary

HPI: Patient is a 52 y.o African-American male with a PMHx of hypothyroidism, GERD and PPHx of OUD, PCP use d/o, cocaine use d/o, ETOH use d/o who was admitted to the ICU for presumed heat stroke after being found down s/p rapid cooling, intubation 2/2 to AMS and AHRF, c/b AKI, elevated troponins, rhabdomyolysis, lactic acidosis, transaminitis, and aspiration pneumonitis.

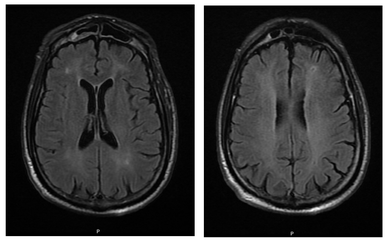
T 106.9F
Cr 3.08
CK 1,100
Troponin 1195
Lactate 4.6
UDS + Coc, PCP
ALT/AST 7K+/4K+
CTH: no acute pathology

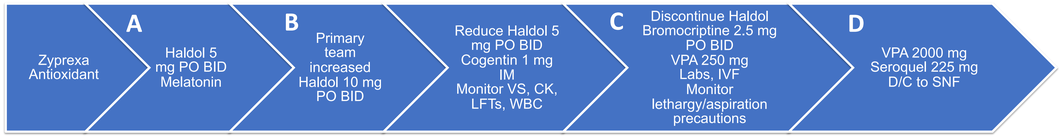
Past Psychiatric History:

- several CRC presentations for rehab placement or 23-hour observation due to intoxication all discharged to outpatient follow up
- 302 at OSH (~1 mo), transferred to rehab (~4 days), left AMA just prior to ICU admission
- **Dx:** Schizophrenia, PTSD, alcohol use d/o, opiate use d/o, PCP use d/o, cocaine use d/o
- **Meds:** Depakote 1500 mg, Zyprexa 30 mg, Thorazine 400 mg, Remeron 30 mg, Cogentin 4 mg TDD

CL psychiatry consulted after patient was extubated and transferred to medicine for agitation from "schizophrenia."

On exam, patient was dysarthric, aggressive, with loose thought process, disoriented, and in restraints. After reviewing his psychiatric history, which was supportive of new-onset worsening neurobehavioral changes, and pathognomonic MRI changes, our team suspected a misdiagnosis of schizophrenia instead of HTLE at OSH, explaining his surprising discharge regimen of several psychotropics at high doses despite no significant history of a primary psychotic disorder.





Medication Management Timeline & Rationale	
A	**Zyprexa** → **Haldol** given safety in hyperactive delirium, renal/liver dysfunction, and consolidate standing & PRN AP dosing
B	Primary team ↑ **Haldol** as behaviors remained unimproved CL identified stiffness in SCM, patient uncooperative with exam, concern for **EPS**, ↓ **Haldol**
C	CL examined patient with diaphoresis and lead pipe rigidity c/f **NMS** **Haldol** → **VPA**, as liver function was improving, added **bromocriptine**
D	Stabilized on **VPA** and **Seroquel** given low D2 potency

Discussion

This case was challenging due to the rarity HTLE, as well as system, patient, and clinical factors that impacted diagnosis and management.

1. Spectrum of neurobehavioral disturbances → Previous studies describe presentations of HTLE that were misattributed to a primary psychiatric diagnosis, leading to inappropriate psychiatric admission refractory to medication management.[2] *It is vital to pay close attention to substance use history and neurologic findings if there is suspicion for HTLE.*

2. System factors → Implicit racial bias towards African-Americans leads to diagnosis of psychotic disorders in this population at disproportionate rates.[3] *Thorough evaluation of patient psychiatric history, including temporality of symptoms, is important to review when attributing behaviors to a diagnosis of schizophrenia versus other etiologies.*

3. Patient factors → Aggressive behavior that limited physical exam & AMS from previous neurotoxic injury that limited communication and assessment of cognition likely led to delays in diagnosis of NMS. *Caution of an increased risk of EPS/NMS in cases with hyperactive delirium secondary to primary brain injury should be exercised, particularly in HTLE.*[4,5]

4. Clinical factors → While a mood stabilizer instead of antipsychotic was most helpful for managing impulsivity, the patient had significant renal and liver dysfunction which prevented its use earlier in hospital course. However, given spongiform degeneration is found in both HTLE and chronic traumatic encephalopathy, an approach targeted towards TBI might also be efficacious in HTLE. *Additional agents that are indicated for aggression in TBI and could have been considered in this case include beta blockers.*[6]

References

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