

Hidden Psychiatric Emergencies: Neuroleptic Malignant Syndrome Concealed in a Case of Lithium Toxicity

Bernice N. Yau, MD, Anne Louise Stewart, MD, Mallory M. Cash, MD

UT Southwestern Medical Center, Department of Psychiatry



Introduction

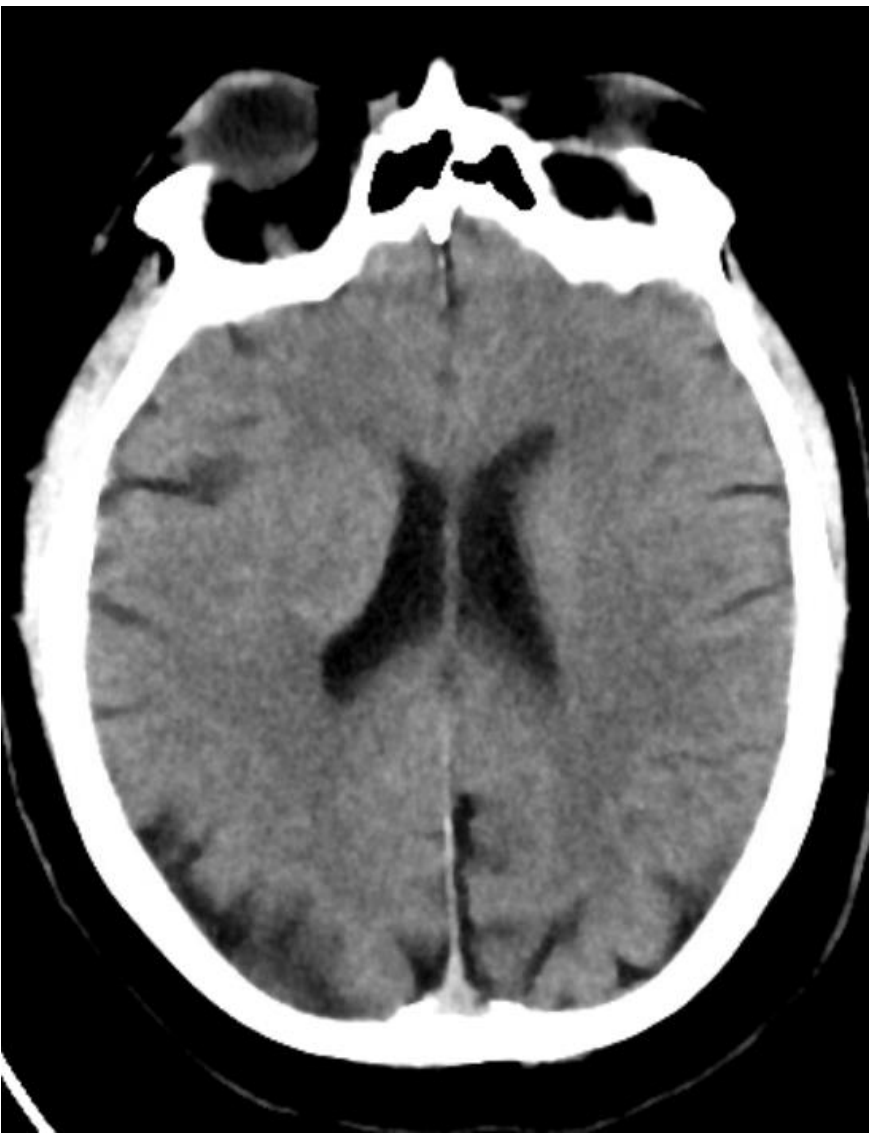
- Lithium with an antipsychotic is a commonly prescribed combination in psychiatry.
- Though concurrent use of lithium and antipsychotics increases the risk of lithium toxicity and NMS, few case reports describe co-occurrence of both conditions [5].
- This is a unique case of NMS, masked by concurrent lithium toxicity, antipyretics, and history of cerebral palsy, stroke, and hypertension.

Case Presentation

A 60 year old man with history of bipolar I disorder, chronic spasticity from cerebral palsy, previous left MCA and PCA strokes, type 2 diabetes mellitus, and hypertension presented to the hospital with altered mental status. Collateral and baseline labs were not immediately available.

Vital Signs on Admission				
Temp 36.8C	BP 92/57 – 182/164	HR 60-86	RR 16-29	SpO2 95-97%

Labs on admission	
CBC	WBC 18.43
CMP	K 7.2, Cr 1.46, ALP 186
UTox	Negative
Lithium level	2.04
CT Brain	No acute intracranial abnormalities
EKG	NSR, QTc 438
Lactate	1.9
CK	54



- Code stroke was activated, however imaging did not reveal any acute abnormalities.
- The patient was admitted to the internal medicine team.
- Lithium was held and asenapine was continued.
- Psychiatry was consulted on Day 2 of hospitalization.

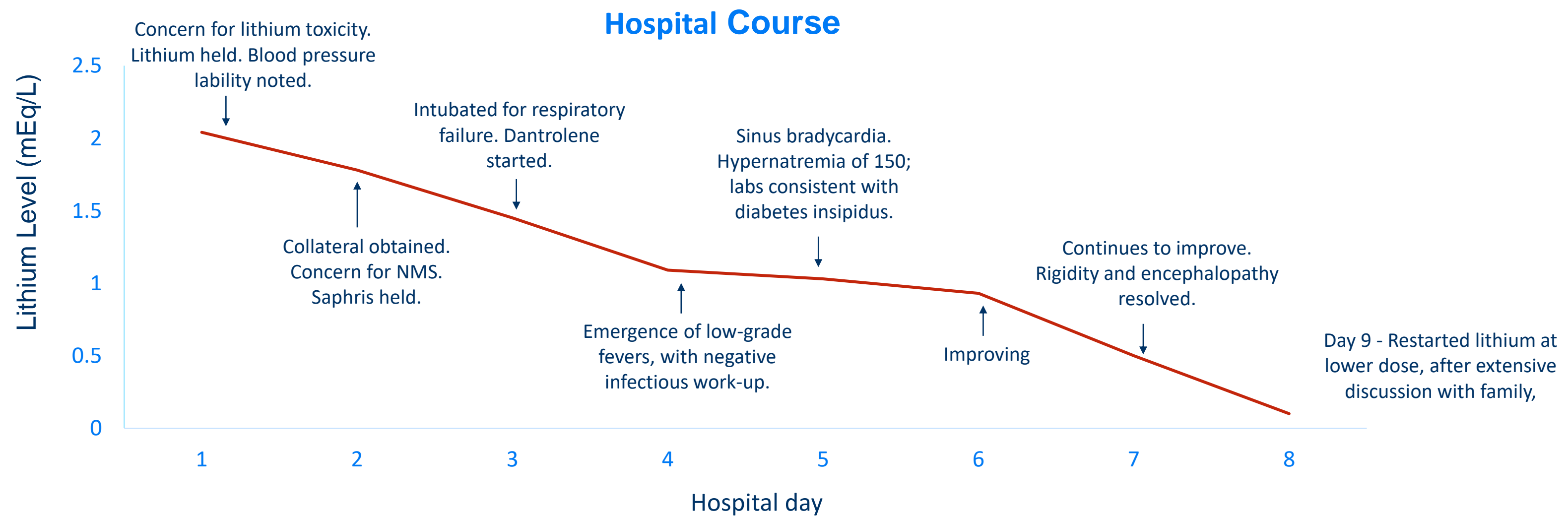
Clinical Course

Day 2 (Initial Psychiatry Consultation)	
<ul style="list-style-type: none">Patient was disoriented to date and situation. Unable to sustain attention during interview.Physical exam revealed dysmetria, dysdiadochokinesia, tremor, upper extremity cogwheel rigidity, severe rigidity in lower extremities, grasp reflex, and waxy flexibility.Blood pressure lability.Differential diagnoses: delirium, lithium toxicity, NMS, catatonia.	<ul style="list-style-type: none">BFCRS 19 but failed lorazepam challenge.Exam was consistent with lithium toxicity, however rigidity, leukocytosis and autonomic instability were concerning for NMS, so asenapine was held.Antipyretics held (suspicion that they may be masking fevers) until collateral could be gathered.Repeat CBC, CK, CMP for the morning. Trend lithium levels.

Collateral from family
<ul style="list-style-type: none">Patient had a history of bipolar 1 disorder with one questionable manic episode with psychotic features decades ago. Has been on regimen of asenapine 10 PO qhs and lithium 900mg PO daily with baseline levels 0.3-0.4mEq/L for decades.Most recent labs from PCP revealed normal renal function.Current rigidity is above patient’s baseline spasticity.His ARB medication was changed from losartan to telmesartan 2 months ago.In the week prior to presentation, he had several hypotensive episodes and fevers treated with Tylenol, followed by progressive lethargy and poor oral intake.

Further work-up
<ul style="list-style-type: none">Repeat labs showed continued leukocytosis of 20.04, CK 993, and resolving AKI.Further VS monitoring showed continued blood pressure lability and fever of 100.3F after antipyretics discontinued.Extensive infectious work-up (serum, CSF, urine) was negative.

Hospital Course
<ul style="list-style-type: none">Day 2-6: Developed small bowel obstruction necessitating NG tube, dysphagia complicated by aspiration, acute hypercapneic respiratory failure requiring intubation, and hypernatremia from nephrogenic diabetes insipidus. Treated with dantrolene.Day 7-8: Encephalopathy and rigidity improving. Concentration testing intact. Cerebellar function intact.Day 9: Lithium level < 0.10. After extensive discussion with family, lithium was restarted at 300mg BID and asenapine was discontinued indefinitely.Day 10 – 17: Patient was transferred to the floor and ultimately discharged to inpatient rehab.



Proposed Mechanism



- Challenges in diagnosing NMS:
 - Baseline motor exam was unknown. It was unclear if rigidity was due to baseline spasticity from CP and previous strokes or if it was new.
 - Fevers masked by antipyretics.
 - Tendency for anchoring bias on diagnosis of lithium toxicity.

Discussion

- This is the first report of NMS caused by lithium and asenapine combination.
- This case highlights the high index of suspicion required for NMS diagnosis when it is masked by concurrent medical conditions or toxidromes [2].
- NMS recurrence is 30% and prompt diagnosis is key in determining which medications to hold or rechallenge [3].
- Though most NMS cases occur within weeks of initiation or titration of an antipsychotic, adjustments to interacting medications can precipitate NMS.
- Importance of coordinating care between PCP and psychiatry.
- Importance of monitoring psychotropic polypharmacy in patients with history of organic brain disorders. This patient’s previous stroke and cerebral palsy may have rendered them at increased risk for adverse effects from medications [1].

References

- Caroff SN, Mann SC (1993). Neuroleptic Malignant Syndrome. *Medical Clinics of North America*, 77(1): 185-202.
- Gurrera RJ, Caroff SN, Cohen A, Carroll BT, DeRoos F, Francis A, Frucht S, Gupta S, Levenson JL, Mahmood A, Mann SC, Policastro MA, Rosebush PI, Rosenberg H, Sachdev PS, Trollor JN, Velamoor VR, Watson CB, Wilkinson JR (2011). An International Consensus Study of Neuroleptic Malignant Syndrome Diagnostic Criteria Using the Delphi Method. *Journal of Clinical Psychiatry*, 72(9): 1222-1228.
- Strawn JR, Keck PE, Caroff SN (2007). Neuroleptic Malignant Syndrome. *American Journal of Psychiatry*, 164(6): 870-876.
- Edokpolo O, Fyyaz M (2012). Lithium Toxicity and Neurologic Effects: Probable Neuroleptic Malignant Syndrome Resulting from Lithium Toxicity. *Case Reports in Psychiatry*, 2012. doi:10.1155/2012/271858
- Szota AM, Radajewska I, Grudzka P, Araszkiwicz A (2020). Lamotrigine, quetiapine and aripiprazole-induced neuroleptic malignant syndrome in a patient with renal failure caused by lithium: a case report. *BMC Psychiatry*, 20(179).