



**Case Report: Lithium Toxicity In A Chronic Alcoholic: An Integrated Approach To Management**

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**Abstract**

This case report delves into the intricate clinical presentation, evaluation, and collaborative management of a 58-year-old male presenting with lithium toxicity exacerbated by chronic alcoholism. The patient's history revealed a 25-year alcohol consumption pattern of 750 ml brandy daily, coupled with recent initiation of Disulfiram and subsequent lithium and divalproex sodium therapy for mood stabilization and insomnia. Clinical manifestations encompassed altered mental status, irritability, and gastrointestinal disturbances. Notably, laboratory investigations highlighted a serum lithium level of 2.30 (toxic range) and elevated serum ammonia at 159. A multidisciplinary approach involving nephrology, psychiatry, neurology, and cardiology was pivotal. Initial interventions encompassed IV fluids, antiemetic, thiamine supplementation, and sedatives. Given the severity of lithium toxicity, emergent dialysis was instituted, leading to normalization of lithium levels post-procedure. This case underscores the complexities of managing drug interactions, especially in the context

of chronic alcoholism, emphasizing the significance of vigilant monitoring, early recognition, and multidisciplinary collaboration in ensuring optimal patient outcomes. The discussion elucidates the challenges posed by polypharmacy, hepatic metabolism alterations, and the imperative role of timely interventions in mitigating associated risks.

**Keywords:** Laboratory Investigations, Bipolar Disorder, Toxic Range

**Introduction**

Lithium, a monovalent cation, has long been regarded as a cornerstone in the pharmacological arsenal against bipolar disorder, a severe psychiatric condition characterized by debilitating mood swings ranging from manic episodes of heightened activity to depressive phases of profound sadness and lethargy. Its efficacy in stabilizing mood fluctuations and preventing relapses in bipolar disorder has been substantiated through decades of clinical research and practice. However, the therapeutic landscape of lithium is marred by its narrow therapeutic window, which necessitates a delicate

balance between achieving therapeutic benefits and averting potential toxicities. Central to the challenges posed by lithium therapy is the interplay between its pharmacokinetics and individual patient factors, such as concurrent medical conditions and concomitant medications. Among these factors, chronic alcoholism emerges as a significant confounding variable, altering the body's metabolic milieu and potentially amplifying the risks associated with lithium therapy. Alcoholism, characterized by chronic and excessive alcohol consumption, exerts multifaceted effects on hepatic metabolism, renal function, and central nervous system physiology. Hepatic enzymes crucial for drug metabolism may be induced or inhibited by chronic alcohol use, thereby influencing the clearance and bioavailability of medications like lithium. Furthermore, alcohol-induced alterations in renal function may compromise the excretion of lithium, further accentuating its potential for accumulation and toxicity. The intricate relationship between chronic alcoholism and lithium therapy is further complicated by the potential for drug-drug interactions, particularly when medications prescribed for alcohol cessation, such as Disulfiram, are incorporated into the treatment regimen. Disulfiram, by inhibiting hepatic enzymes involved in alcohol metabolism, may inadvertently affect the metabolism and clearance of other drugs, including lithium, thereby altering their pharmacokinetic profiles and predisposing patients to adverse events. Against this backdrop, clinicians are tasked with navigating a complex therapeutic landscape characterized by multiple potential pitfalls. The case presented herein epitomizes the challenges encountered in managing a patient with a confluence of chronic alcoholism and lithium therapy. It underscores the imperative for a nuanced understanding of pharmacological interactions, vigilant monitoring

practices, and a multidisciplinary approach to patient care. As we delve deeper into this case, we unravel the intricacies of drug interactions, metabolic alterations, and the pivotal role of collaborative care in ensuring optimal patient outcomes amidst the complexities of chronic alcoholism and lithium therapy.

### Case Discussion

A 58-year-old male presented with drowsiness, irritability, and giddiness of 15 days duration. He had a 25-year history of chronic alcoholism, consuming 750 ml of brandy daily. Notably, he had been prescribed Disulfiram and subsequently initiated on lithium and divalproex sodium for mood stabilization and insomnia, respectively. His antihypertensive medication was discontinued 5 days prior to presentation. Upon examination, the patient exhibited irritability and aggressiveness with a Glasgow Coma Scale (GCS) score of 12/15. Vitals remained stable with peripheral pulses and warmth intact.

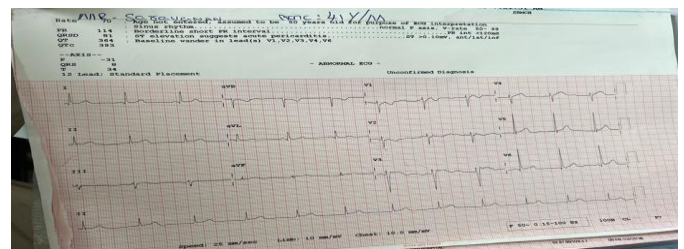


Figure 1

Laboratory investigations revealed a serum lithium level of 2.30 (toxic range) and elevated serum ammonia at 159. USG abdomen showed no significant abnormalities. 2d ECHO was normal with no evidence of cardiomyopathy. The patient was diagnosed with lithium toxicity exacerbated by chronic alcoholism, manifesting as altered mental status, elevated lithium levels, and deranged liver function tests. A multidisciplinary approach was adopted, involving nephrology, psychiatry, neurology, and cardiology consultations. Initial management included IV fluids, antiemetics, thiamine

supplementation, and sedatives. Given the severe lithium toxicity, nephrology advised for immediate dialysis. Post-dialysis, serum lithium levels normalized to 0.80. The confluence of chronic alcoholism and lithium therapy presents unique challenges. Chronic alcohol consumption alters hepatic metabolism, potentially elevating lithium levels due to reduced clearance. Furthermore, Disulfiram, an alcohol deterrent, can inhibit hepatic enzymes, exacerbating drug interactions. Lithium toxicity can manifest with a spectrum of symptoms ranging from gastrointestinal disturbances to neurological complications, emphasizing the need for vigilant monitoring. Early recognition and intervention, including hemodialysis in severe cases, are pivotal in preventing morbidity and mortality. Moreover, the patient's history of hypertension underscores the importance of consistent medical management. Abrupt discontinuation of antihypertensive medications can precipitate hypertensive crises, further complicating the clinical picture. With consistent and collaborative medical management, the patient's irritability, aggressiveness, and altered mental status progressively resolved. His Glasgow Coma Scale (GCS) score improved, indicative of neurological recovery and diminished toxicity effects. Furthermore, vital signs remained stable, reflecting the efficacy of the therapeutic interventions and the patient's positive response to treatment. Given the complexities associated with polypharmacy, chronic alcoholism, and potential drug interactions, the patient's improvement underscored the importance of a coordinated and vigilant clinical approach. Regular monitoring, timely interventions, and interdisciplinary collaboration were instrumental in addressing the multifactorial nature of his presentation. Upon achieving stabilization and resolution of acute symptoms, the patient was deemed fit for discharge. Comprehensive discharge planning ensured

that he received adequate counseling regarding medication adherence, the risks associated with alcohol consumption, and the importance of regular follow-up with multiple specialties, including psychiatry, nephrology, and cardiology, to monitor his ongoing health status. In conclusion, the successful management and recovery of this patient highlight the significance of timely diagnosis, multidisciplinary collaboration, and tailored therapeutic interventions. His improvement, both clinically and biochemically, post-dialysis and supportive care, underscore the pivotal role of hemodialysis in severe lithium toxicity cases. This case serves as a poignant reminder of the complexities inherent in managing polypharmacy scenarios and emphasizes the imperative of a patient-centric approach to ensure optimal outcomes.

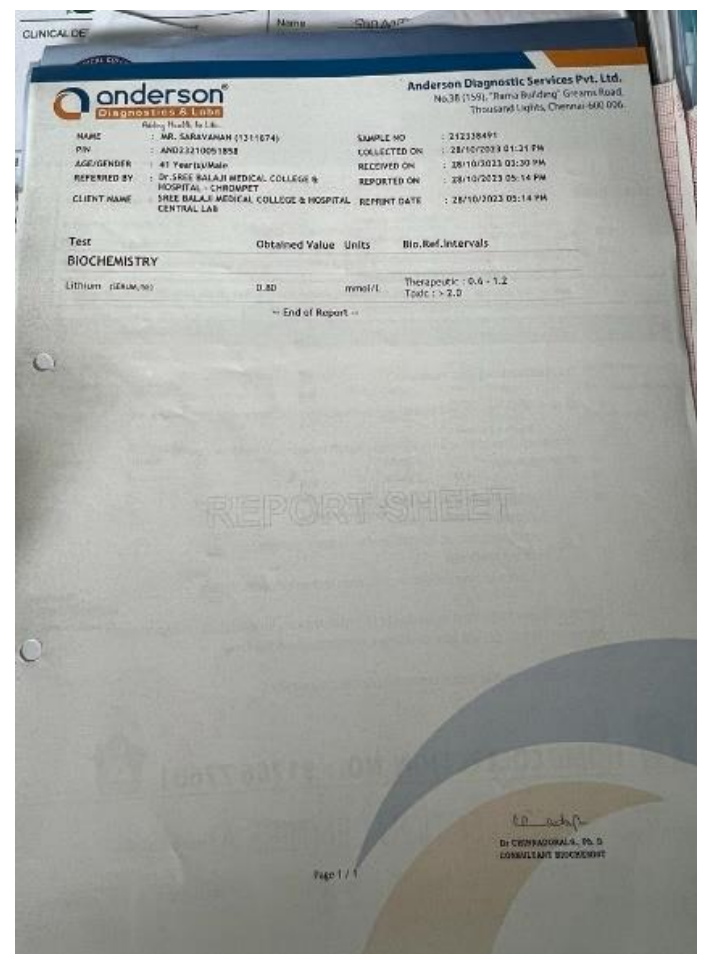
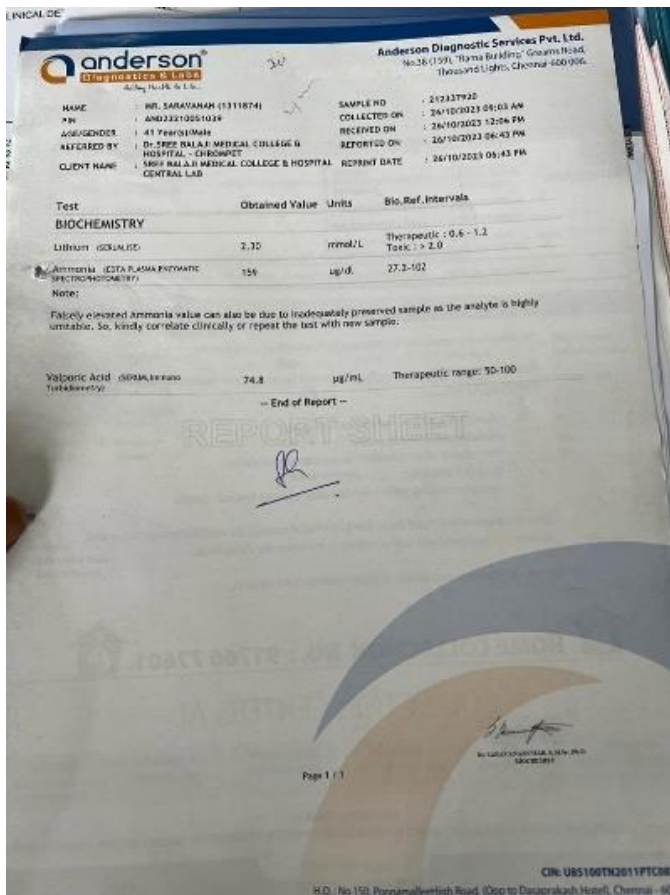


Figure 2: Serum Lithium before dialysis



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Figure 3: Serum Lithium after dialysis

**Conclusion**

This case exemplifies the intricate interplay between chronic alcoholism and lithium therapy, culminating in severe toxicity necessitating emergent interventions. A collaborative, multidisciplinary approach facilitated timely diagnosis and management, ensuring the patient's recovery. Vigilant monitoring, drug interactions, and patient education remain paramount in mitigating risks associated with polypharmacy and chronic alcoholism.

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