Emerging Perspectives: GLP-1 Agonists and Lithium Toxicity - A Case Report

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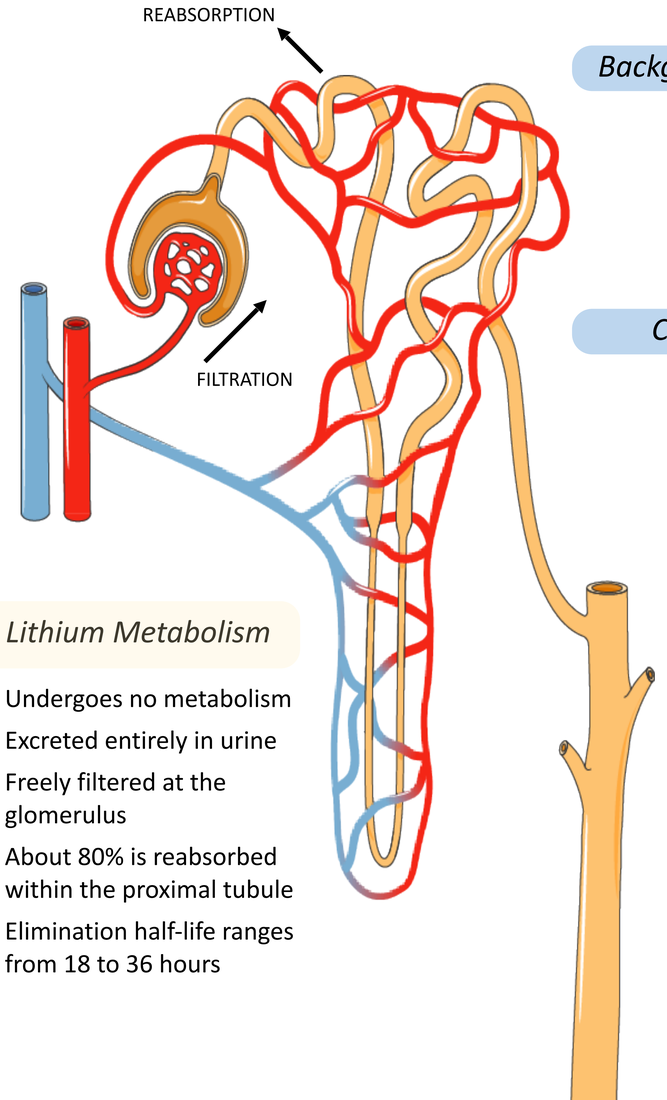


Lithium Metabolism

- Undergoes no metabolism
- Excreted entirely in urine
- Freely filtered at the glomerulus
- About 80% is reabsorbed within the proximal tubule
- Elimination half-life ranges from 18 to 36 hours

Objective

To discuss possible mechanisms by which GLP-1 agonists could impact serum lithium levels

Background

- Lithium toxicity can occur following sudden weight loss from bariatric surgery (Jamison, 2020)
- There is limited research on whether weight loss medications such as glucagon-like peptide 1 (GLP-1) agonists contribute to lithium toxicity
- We present a case of lithium toxicity in a patient who started semaglutide injections 6 weeks prior to presentation

Case

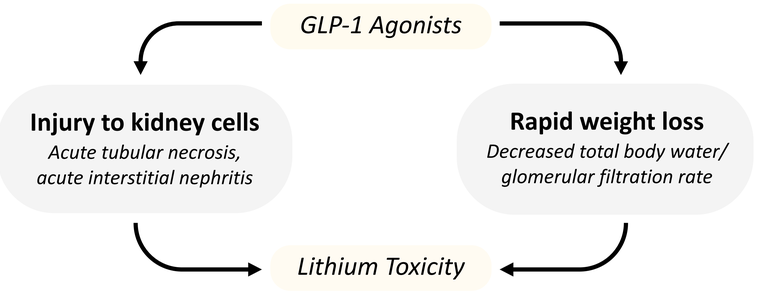
A 59-year-old man with bipolar 1 disorder who was stable on lithium CR 450 mg daily presented with 3 days of tremor, weakness, confusion, nausea/vomiting, and unsteady gait

- Lithium level: 2.6 (0.6-1.2 mmol/L)
- Creatinine: 2.02 (0.5-1.3 mg/dL)
- Heart rate: 37 bpm
- Several indications for hemodialysis:
  - *Severe bradycardia, doubling of creatinine (baseline 0.7), predicted lithium level in 36 hours of 1.62 mmol/L with fluids alone (EXTRIP - Decker, 2015)*
- Denied common precipitants for toxicity:
  - *Non-steroidal anti-inflammatory drug use, diuretic use, dehydration, recent illness, vomiting, diarrhea, strenuous exercise, or taking more of his lithium than prescribed*
- Started weekly semaglutide injections 6 weeks ago, with the most recent injection 2 weeks ago
- Reported decreased oral intake and about 10-pound weight loss while on semaglutide
- Retaining 496 cc on bladder scan, started on tamsulosin

By hospital day 5 after two sessions of hemodialysis, his symptoms resolved. Semaglutide was not restarted.

Discussion

It remains unclear what caused this patient's AKI and subsequent lithium toxicity, with possible contributors including acute semaglutide use (Sharma, 2019), urinary retention, and chronic lithium use (Davis, 2018). However, it is notable that the toxicity occurred shortly after the patient started semaglutide. As GLP-1 agonists become more widely prescribed, it is important to monitor how they interact with lithium, which has a narrow therapeutic range, and to understand the potential mechanisms by which GLP-1 agonists may be linked to lithium toxicity (Jamison, 2020).



Conclusion

Psychiatrists should be aware of the risk of fluctuating lithium levels in patients who start GLP-1 agonists.

References

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