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Published In/Presented At

Gaetani, S.L., Amaducci, A.M., Fikse, D., & Koons, A.L. (2021). *Lithium toxicity: A case report of toxicity resulting in a third-degree heart block*. Poster presented at Lehigh Valley Health Network, Allentown, PA.

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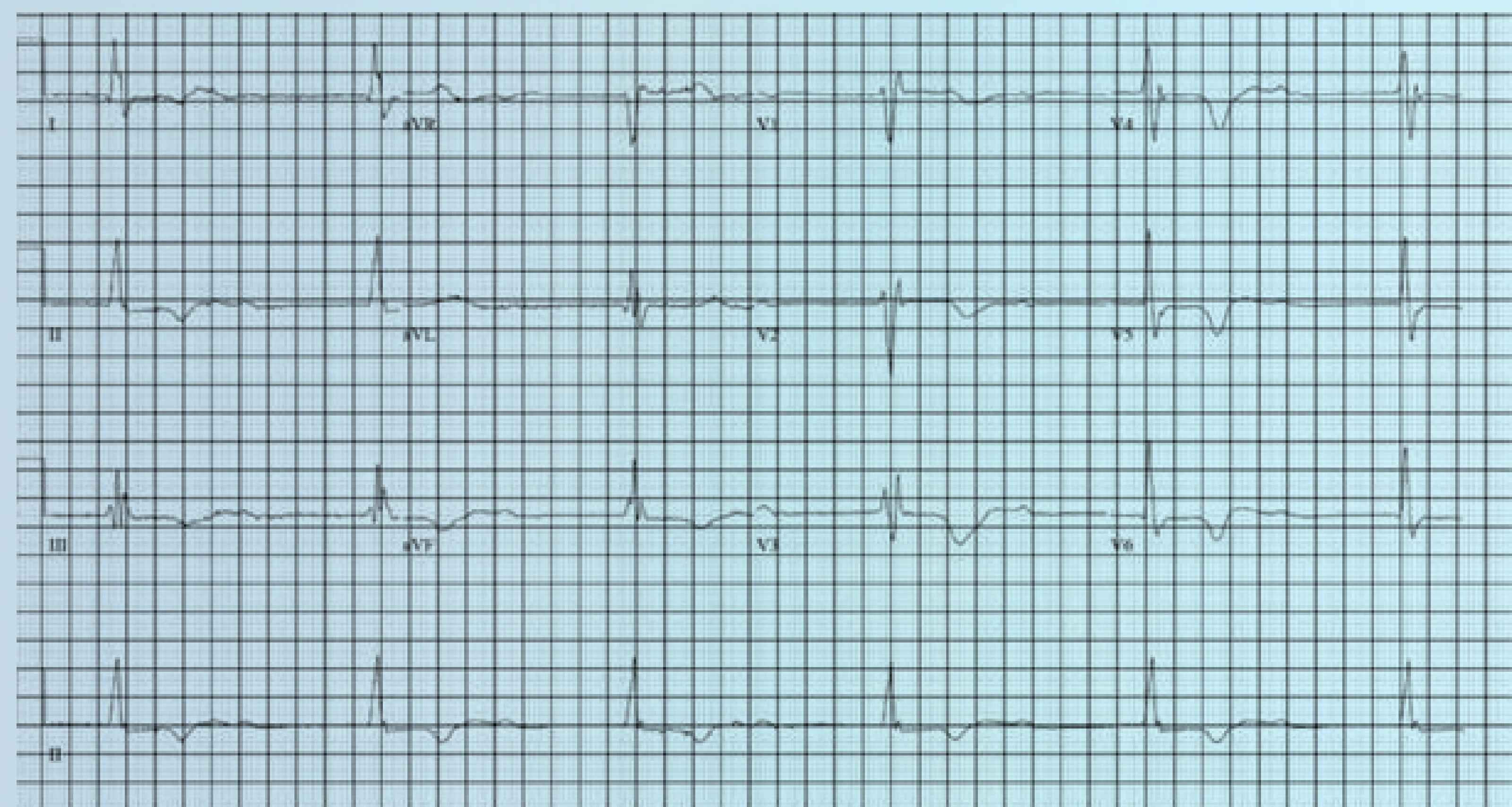
Lithium Toxicity: A Case Report of Toxicity Resulting in a Third-Degree Heart Block

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Background

Lithium is a medication used to treat bipolar disorder. It has a narrow therapeutic index and its toxicity is frequently seen. Hypothesis: Hemodialysis and pacemaker placement can combat cardiotoxicity in a patient with lithium toxicity.



This EKG shows third degree heart block at a rate of 33 bpm. There is QRS widening at 174ms with RBBB and a prolonged Qtc at 560ms. [normal QRS is 70-100ms and normal Qtc <450 ms for males and <470 ms for females].

Methods

This is a single patient case report. A 66-year-old female with a past medical history of hypothyroidism, diabetes mellitus II, hypertension, and bipolar disorder presented to the emergency department for fatigue, depression, tremors, and decreased appetite and fluid intake. One of her prescribed medications was lithium 300 mg twice daily. An electrocardiogram demonstrated a third-degree heart block. A lithium concentration of >3 mEq/L [reference range 0.6-1.2 mmol/L, with 3 mEq/L the maximum detectable in our laboratory] was detected. A send-out test determined her lithium concentration to be 3.8 mmol/L [1.5-1.2]. Given that the patient had bradycardia along with prolonged QRS and QTc intervals with lithium toxicity, the medical toxicology service recommended normal saline, two amps of sodium bicarb, and two grams of magnesium sulfate. The patient developed worsening encephalopathy and hemodialysis was recommended.

Results

The patient underwent emergent dialysis, which resulted in improvement of her mental status and laboratory abnormalities. However, the third-degree heart block had not resolved. A permanent pacemaker was placed. Over the previous several days, she had decreased oral intake. This led to dehydration and subsequent renal dysfunction. In addition, this patient was on hydrochlorothiazide, contributing to reduced renal elimination and dehydration and resultant lithium accumulation. This patient was initially somnolent and had tremors consistent with mild symptoms; however, she became encephalopathic and hemodynamically unstable leading to the decision to start hemodialysis.

Conclusion

Lithium is a commonly used medication and can present with a multitude of toxicities, including third-degree heart block resistant to hemodialysis alone.

This case report did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.