

LETTER TO THE EDITOR

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# Lithium overdose and related tests

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## Abstract

Lithium acts biochemically through the inositol depletion in brain cortex. At low doses, however, it is partly effective and/or ineffective, whereas in high concentrations is toxic. We would like to make one point about this review. In fact, in our view, the patient should be given a support to correct hypernatremia and even sodium levels should be tested serially—along with serum lithium concentrations—because high sodium levels reduce the rate of elimination of lithium. Lithium is mainly a neurotoxicant. Lithium-related central nervous system toxicity as well as the cardiovascular and thyroid changes are most likely due to the cations ( $\text{Na}_2^+$  and  $\text{K}^+$ ) competition.

Hausmann and colleagues (2015) provide a very useful review of lithium intoxication. As they rightly point out, there is an urgent need for comprehensive evaluations in the clinical management of patients with lithium intoxication (Hausmann et al. 2015). Lithium, as lithium carbonate ( $\text{Li}_2\text{CO}_3$ ) and/or lithium citrate ( $\text{Li}_2\text{C}_6\text{H}_5\text{O}_7$ ), is among the most recommended drugs for the treatment of bipolar disorder by international guidelines (Casarett et al. 2008). Lithium acts biochemically through the inositol depletion in brain cortex (Casarett et al. 2008). At low doses, however, it is partly effective and/or ineffective, whereas in high concentrations is toxic (Casarett et al. 2008). Their study led the investigators to endorse a serial blood measurements of lithium (Hausmann et al. 2015) during the critical period of acute lithium poisoning (or acute-on-chronic intoxication), mentioning previous studies to support such a position (Timmer and Sands 1999; Casarett et al. 2008). Therefore, the authors suggest that measurement of lithium (i.e., every 2–4 h) (Hausmann et al. 2015) should be incorporated in medical management in the emergency department. However, we would like to make one point about this review. In fact, in our view, the patient should be given a support to correct hypernatremia and even sodium levels should be tested serially—along with serum lithium concentrations—because high sodium levels reduce the rate of elimination of lithium (Liamis et al. 2009; Grunfeld and Rossier 2009). Lithium

is mainly a neurotoxicant (Casarett et al. 2008). Lithium-related central nervous system toxicity as well as the cardiovascular and thyroid changes are most likely due to the cations ( $\text{Na}_2^+$  and  $\text{K}^+$ ) competition (Casarett et al. 2008). As the authors correctly assert, (Hausmann et al. 2015) pharmacologic management, laboratory testing, and specific recommendation should be implemented to improve effectiveness of lithium poisoning treatment.

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## Competing interests

The authors declare that they have no competing interests.

Received: 14 December 2015 Accepted: 23 December 2015

Published online: 12 January 2016

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