

Lithium Toxicity From an Internet Dietary Supplement

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ABSTRACT

Introduction: The widespread availability of medications and herbal products on the Internet has increased the potential for poisonings. We are reporting a case of mild, acute lithium toxicity occurring after the intentional misuse of a lithium-containing “dietary supplement” (Find Serenity Now®) obtained over the Internet.

Case Report: An 18-year-old woman presented to our emergency department (ED) after ingesting 18 tablets of Find Serenity Now®; each tablet contained, according to the listing, 120 mg of lithium orotate [3.83 mg of elemental lithium per 100 mg of (organic) lithium orotate compared to 18.8 mg of elemental lithium per 100 mg of (inorganic) lithium carbonate]. The patient complained of nausea and reported one episode of emesis. Her examination revealed normal vital signs. The only finding was a mild tremor without rigidity. Almost 90 minutes after the ingestion, her serum lithium level was 0.31 mEq/L, a urine drug screen was negative, and an electrocardiogram (ECG) showed a normal sinus rhythm. The patient received intravenous fluids and an anti-emetic; one hour later, her repeat serum lithium level was 0.40 mEq/L. After 3 hours of observation, nausea and tremor were resolved, and she was subsequently transferred to a psychiatric hospital for further care. Prior human and animal data have shown similar pharmacokinetics and shared clinical effects of these lithium salts.

Discussion: Over-the-Internet dietary supplements may contain ingredients capable of causing toxicity in overdose. Chronic lithium toxicity from ingestion of this product is also of theoretical concern.

INTRODUCTION

The proliferation of the Internet has allowed a large increase in online medications and herbal remedies [1,2]. These substances are advertised without regulation, and they are purchased and used without supervision or monitoring. The widespread availability of herbal and medicinal products from Internet sources has increased the potential for poisonings. Patients who obtain these products are subject to toxicity, drug-drug interactions, and other adverse effects. We are reporting a case of mild, acute lithium toxicity that occurred after the intentional misuse of a lithium-containing “dietary supplement” (Find Serenity Now®) obtained over the Internet.

CASE REPORT

An 18-year-old woman presented to our ED after an intentional ingestion of 18 tablets of Find Serenity Now®. (The product’s supplemental facts listed each tablet as containing 120 mg of lithium orotate). The patient initially complained of nausea and reported one episode of emesis shortly after the ingestion. Physical examination revealed normal vital signs. The only finding was mild, diffuse tremor without rigidity. Almost 90 minutes after the ingestion, her serum lithium level was 0.31 mEq/L. A comprehensive urine drug screen using gas chromatography and mass spectroscopy was negative and an ECG showed a normal sinus rhythm. The patient received intravenous fluids and

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an anti-emetic. One hour later the repeat serum lithium level was 0.40 mEq/L. After 3 hours of observation (4.5 hours post ingestion), her nausea and tremor had resolved, she tolerated oral fluids, and she had no ataxia. She was subsequently transferred to a psychiatric hospital for further evaluation and care.

DISCUSSION

Find Serenity Now® (Urban Nutrition, LLC) is advertised as “the all-natural, *mineral* form of Lithium.” It is reported as “effective, safe, non-toxic, non-addictive, and has no side effects” [3]. It is readily available over the Internet. Each tablet is listed as containing 120 mg of lithium orotate (3.83 mg of elemental lithium per 100 mg of [organic] lithium orotate compared to 18.8 mg of elemental lithium per 100 mg of [inorganic] lithium carbonate). Animal models suggest that lithium orotate has similar kinetics, but the lithium orotate may achieve higher tissue concentrations at the same dosages commonly prescribed for lithium carbonate and lithium citrate formulations [4–6]. This may be secondary to lower renal clearance of the lithium orotate salt [5,6].

Lithium's widespread use and its narrow therapeutic index can lead to adverse effects in up to 90% of all users [7–11]. Most toxicity is mild and includes lethargy, vomiting, ataxia, and myoclonus, but massive, acute ingestions or severe chronic toxicity can lead to coma or seizures. Other adverse effects include thyroid and parathyroid abnormalities, serotonergic crisis, cardiovascular abnormalities, and nephrogenic diabetes insipidus [9,11–13]. Onset and severity of symptoms vary upon the timing of ingestion and product formulation. The risk of toxicity increases with increased age, renal insufficiency, hyponatremia, volume depletion, drug-drug interactions, and comorbidities or co-ingestions [14,15]. Significant toxicity tends to occur when levels are well above the upper therapeutic level (1.5 mEq/L); however, lithium's variable absorption and delayed tissue concentrations make interpretation of serum levels difficult. Toxicity may also occur at lower levels, especially in the setting of chronic use [7,8,11,16].

Over-the-Internet dietary supplements and medications are becoming increasingly common [1]. Little data exists detailing the true extent and availability of these substances, but several Internet sites exist for their appropriation. These products are immune from extensive scrutiny and regulation and several product-sites fail to adequately describe product formulations, potential adverse effects, or contraindications to their product [1,17]. A study by Ashar et al. showed that 41% of internet sites marketing ephedra did not contain information about potential contraindications or adverse effects, a surprisingly high number considering the potential dangers of the product [18].

This report illustrates that over-the-Internet supplements are capable of causing adverse clinical effects following an acute exposure. It is plausible that significant toxicity may develop after a massive overdose or from chronic ingestion. Drug-drug interactions and other adverse effects are also of concern. Physicians must be aware of the increasing use of non-prescribed herbal and supplemental medications and their possible toxicity profiles and interactions.

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