

Weight loss supplement causing acute heart block in a child

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Brief Report

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Abstract

A 16-year-old male was admitted to the paediatric ICU with acute onset of vomiting, somnolence, and chest pain, and electrocardiogram showing 2nd degree heart block after ingesting an *Aleurites moluccana* (Candlenut) seed as a herbal weight loss supplement. Electrocardiogram showed progressively worsening heart block with down-sloping of the ST segments, resembling digoxin toxicity. After 2 days of ICU observation, his symptoms began to improve and eventually resolved. The side effects of herbal supplements are often unknown but by analysing cases such as these, physicians can develop a better understanding of these substances to help guide management.

The increasing use of herbal supplements warrants physician awareness of potential dangers. *Aleurites moluccana* (Candlenut) taken by a child caused a toxic digoxin-like effect with 2nd degree heart block requiring monitoring in the paediatric ICU. Herbal supplements, which are poorly regulated in the United States, often contain unknown compounds and can have severe unintended effects on users. As such, it is important for physicians to examine these cases to learn of potential harms and guide patient management.

Case presentation

A 16-year-old male was admitted to the ICU with 2nd degree heart block. The patient presented to the emergency department after taking a “nuez de la india” or Candlenut (*A. moluccana*) purchased in Mexico as a herbal weight loss supplement. The patient reported boiling the whole nut and drinking the tea, after which he chewed up and swallowed the leftover nut. Within 2 hours of ingestion, he developed chest pain, abdominal pain, and profuse vomiting. He presented to the emergency department where an electrocardiogram showed 1st degree heart block with diffuse T wave inversion. Blood counts and electrolytes were otherwise normal. He was discharged home from the emergency department without cardiology consult. When the electrocardiogram was reviewed by the on-call paediatric cardiologist the following morning, the patient was contacted and asked to come back to the hospital. At this second emergency room presentation, the patient's symptoms had worsened: his abdominal pain was more intense, his vomiting persisted, and he was extremely fatigued. Electrocardiogram findings had progressed to Mobitz type 1 heart block with occasional 2:1 block (Fig 1). He was admitted to the paediatric ICU for closer monitoring. His workup in the ICU showed elevated troponins to a peak of 0.064, normal electrolytes, negative digoxin level, and negative lyme antibodies. Echocardiogram demonstrated normal structure, wall motion, and coronary origins. That evening, the patient became even more somnolent and developed marked bradycardia with a heart rate around 30 beats/minute. Repeat electrocardiogram now showed persistent 2:1 block (Fig 2). Blood pressure remained within normal limits, and no acute intervention was taken at that time. The following day, troponins began to decrease and his symptoms began to improve. By the third hospital day, his symptoms had fully resolved, electrocardiogram showed significant improvement, and troponins were back within normal limits. He was discharged home shortly afterwards. At his outpatient follow-up one week later, his electrocardiogram findings had totally normalised.

Discussion

The symptoms experienced by the patient in this case included abdominal pain, vomiting, chest pain, and somnolence with serial electrocardiograms showing progressively worsening heart block from 1st degree to 2:1 block. Serial electrocardiograms did not show atrial tachycardia as classically found in digoxin toxicity; however, the progressive atrioventricular block with inverted T waves and downsloping ST segments as seen best in leads V5 and V6 do appear consistent with digoxin effect. Of note, the patient had negative digoxin levels and no reported digoxin exposure; however, a review by Moffett et al showed that there is not a strong correlation between digoxin serum concentration and symptoms of toxicity in children.¹

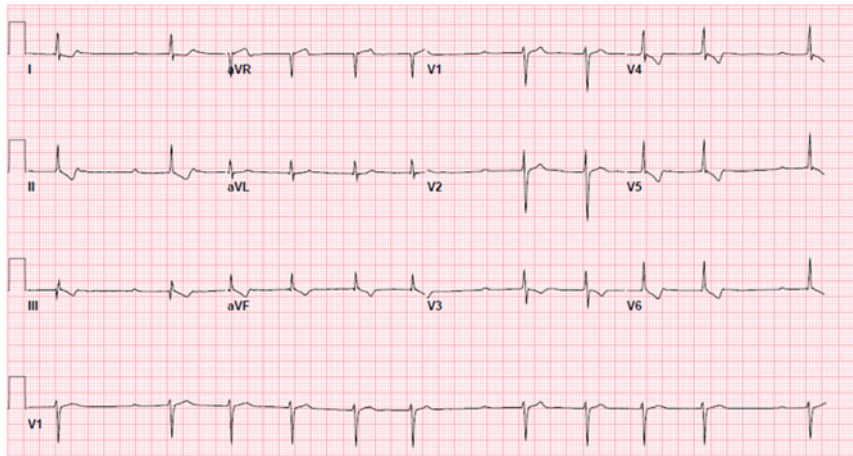


Figure 1. Electrocardiogram at 2nd emergency department presentation, approximately 18 hours after supplement ingestion, showing 2nd degree heart block Mobitz type 1 with occasional 2:1 block, and T-wave inversion in inferior and lateral leads.

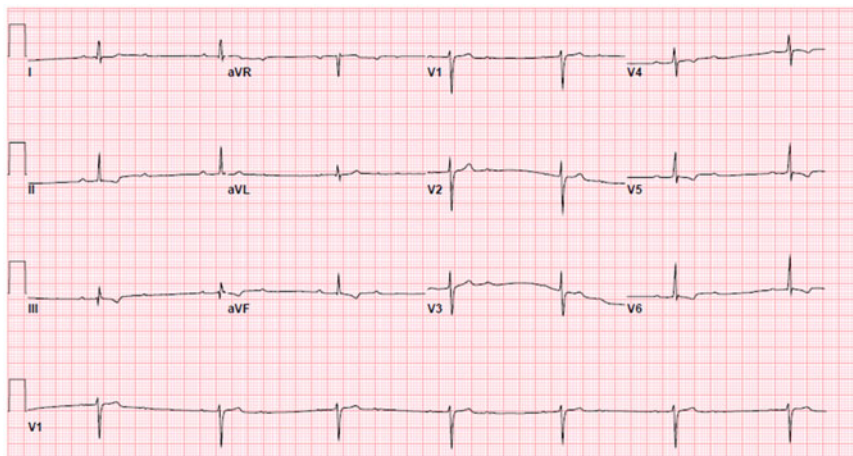


Figure 2. Electrocardiogram in ICU with 2:1 block and bradycardia, approximately 31 hours after supplement ingestion. T-wave depression still present in inferior and lateral leads. Down-sloping of ST segments best seen in leads V5 and V6.

There have been multiple case reports on the potential toxicities associated with Candlenut including cardiac, neurologic, and GI disturbances²⁻⁴; however, heart block has not previously been reported. The mechanism of action causing these problems is not clear. It is also unknown how often symptoms such as these are experienced by users of Candlenut. One pharmacological review of Candlenut² describes toxic phenol esters that could potentially cause such symptoms. Candlenut also contains oleic and linoleic acids which have been suggested to increase sensitivity to cardiac glycosides⁵ such as digoxin. Other factors that may affect development of symptoms include manner of ingestion (boiled in a tea versus ingested directly), amount of nut used, any processing or alteration of the nut prior to use, or unknown factors in Candlenut users that may predispose to toxicity. In the case presented, no underlying congenital cardiac lesion was identified to play a role in the patient's symptoms.

Candlenut is commonly used in many countries in traditional medicine and herbal remedies. In the United States, it is often marketed as a safe and effective herbal weight loss supplement and is readily available in stores and online. However, in countries

where its use is common, Candlenut is well known to cause serious side effects. Its sale and use have even been restricted or banned in several South American and European countries² including Spain, Argentina, Chile, and Brazil. In the United States, herbal supplements have little regulation and Candlenut is readily available in many online stores.

Conclusion

Candlenut and most other herbal supplements have little regulation in the United States and often contain compounds that may cause serious toxic side effects. In this case, a child experienced a severe episode of acute heart block after ingesting a Candlenut seed. His presentation appeared similar to digoxin toxicity with progressively worsening heart block and gastrointestinal symptoms. Fortunately, his symptoms resolved without requiring significant intervention a few days after supplement ingestion. Analysing cases such as this can bring awareness of potential dangers associated with these supplements and help guide management of similar cases.

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Conflicts of Interest. None.

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