CASE REPORT

Asystole caused by Hydroxycut Hardcore: A case report and literature review

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Obesity is a rising epidemic worldwide driving people to search for remedy through nonconventional therapies. Hydroxycut products are popular supplements used as weight loss aids. Many reports revealed serious adverse effects related to their ingestion. We report the case of a 37-year-old healthy male patient who presented following an episode of syncope. On telemetry, he manifested recurrent sinus node arrests, including a symptomatic 24 s sinus pause. The patient admitted to taking Hydroxycut Hardcore for 10 days previously. After discontinuation of the drug, his symptoms completely resolved. This is the first case of Hydroxycut-associated syncope secondary to bradyarrhythmia.

KEYWORDS

asystole, dietary supplement, Hydroxycut, obesity, weight loss

1 | INTRODUCTION

Nowadays, obesity has become a major healthcare problem worldwide. Up to two-thirds (68.8%) of the American adult population are considered to be overweight, and one-third (35.7%) are obese, according to the National Health and Nutrition Examination Survey (Flegal, Carroll, Kit, & Ogden, 2012). This epidemic has led to the increased use of over-the-counter diet aids and Americans are spending billions of dollars annually on these herbal medicines. Since most herbal remedies are classified as dietary supplements, they are not strictly regulated by the US Food and Drug Administration (FDA), thus, evidence of safety and/or efficacy is not mandatory prior to their marketing. As a matter of fact, herbal supplements are responsible for over 13,000 adverse events every year such as liver failure, colitis, and rhabdomyolysis, and sudden cardiac death, among others (Morrow, 2008).

Hydroxycut is one of the most popular brands of dietary supplements that are marketed as a weight loss aid (Lobb, 2009). Prior to 2004, Hydroxycut products used to contain *ephedra* which was banned by the FDA following multiple incidences of seizures, heart attacks, and strokes. Later on, FDA issued a consumer warning advising to stop using this form of therapy because of its hepatotoxic effect (Dara, Hewett, & Lim, 2008). Then, in 2009, these products were reformulated and placed back on the market despite serious reported

side effects such as ulcerative colitis, atrial fibrillation, and ventricular tachycardia. In this report, we describe a case of profound asystole in a young healthy patient caused by the use of Hydroxycut products.

2 | CASE REPORT

Thirty-seven-year-old healthy man presented to our emergency department because of recurrent brief episodes of syncope at home. Patient had several episodes of loss of consciousness for few seconds each, occurred at rest and resolved spontaneously. The last episode was more prolonged and was complicated by generalized tonic-clonic jerky movements. The patient denied previous similar events. He never used to take any medication, but admitted being on Hydroxycut Hardcore started 10 days prior as a supplement for weight loss, at the recommended dose by the manufacturer. He never smoked cigarettes, did not consume alcohol, caffeine or energy drinks, and has never used illicit drugs. There was no family history of arrhythmia or sudden cardiac death. At his presentation, the patient was in no distress, completely asymptomatic. On physical examination, patient was noted to be obese with a body mass index (BMI) of 37.6 Kg/m². His heart rate was 50 bpm, blood pressure was 143/79. Cardiovascular, pulmonary, and neurological examinations were normal. Laboratory

tests returned unremarkable including a negative titer for Lyme. Two sets of cardiac enzymes were negative, and a urinary drug screening test was irrelevant. In addition, electrocardiogram (Figure 1), computed tomography scan of the head, and a routine electroencephalogram were normal. Shortly after admission, the patient had another witnessed syncope for few seconds, followed by a convulsive seizure. Recorded telemetry prior to this event showed prolonged asystole for 24 s following an episode of sinus bradycardia (Figure 2). A temporary pacemaker was then implanted. The patient was kept under cardiac monitoring for the following 72 hr, but no other event was recorded. Prior to discharge, patient also had a two-dimensional echocardiogram, a tilt table testing with provocation, and a sleep study which all came back normal. Six weeks later, he was seen in the office for follow-up. The patient was completely asymptomatic and had no recurrence of his symptoms.

3 | DISCUSSION

Hydroxycut has been associated mostly with tachyarrhythmia because it contained sympathomimetics such as *ephedra* and caffeine. To the best of our knowledge, this is the first case of Hydroxycut-related bradyarrhythmia with symptomatic and life-threatening asystole. After the major two shakedowns by the FDA in 2004 and 2009, the manufacturer of Hydroxycut removed all the “suspicious” ingredients from its formula, and as of 2013, the primary components included caffeine anhydrous, Lady’s mantle extract (*Alchemilla*

vulgaris), Wild olive extract (*Olea europaea*), Cumin extract (*Cuminum cyminum*), Wild mint extract (*Mentha longifolia*) and, in some products, green coffee bean extract (*Coffea canephora robusta*) (Smith, 2013). Figure 3 lists the ingredients of Hydroxycut Hardcore that the patient in our case was using prior to his presentation. In spite of this major change in the drug formula, serious adverse events secondary to Hydroxycut ingestion were still being reported. For instance, in 2010, Karth et al. reported a case of atrial fibrillation with rapid ventricular response following a 2-week course therapy with Hydroxycut in a 63-year-old female (Karth, Holoshitz, Kavinsky, Trohman, & McBride, 2010). Likewise, a more recent article in 2015 written by Hammond et al. described a case of ventricular tachycardia in an 18-year-old healthy female who was taking Hydroxycut Gummies for 10 days (Hammond et al., 2015). The patient in our case report had severe life-threatening sinus arrest attributed to the use of Hydroxycut Hardcore after a negative extensive workup. After a thorough review of the ingredients of this drug (Figure 3), none of its components explicitly listed on the label have been associated with cardiac dysrhythmias in the literature. But, it is important to note that Hydroxycut is a multicomponent product that contains ingredients other than the listed on the label, which may have contributed to the effects observed in this patient. Among the ingredients of Hydroxycut, are wild olive extracts and L-theanine which is a substance found in green tea leaves. Nevertheless, the extraction procedure of these substances remains unknown. Consequently, other constituents of wild olives and green tea might also be present in the final formula of Hydroxycut Hardcore such

FIGURE 1 Electrocardiogram upon presentation showing normal sinus rhythm with rate of 50 bpm and 1st degree AV block

FIGURE 2 Cardiac rhythm monitoring strip showing severe sinus bradycardia followed by asystole for 24 seconds. (The ECG strip was modified to fit in the figure)

Supplement Facts	
Serving Size: 2 Capsules Servings Per Container: 30	
Amount Per Serving	% Daily Value
Pyroxyclene Anhydranine™ Blend 370 mg	†
Caffeine anhydrous	†
Supplying 270 mg of caffeine	†
L-theanine	†
Cayenne pepper (as <i>Capsicum annuum</i>) (fruit)	†
Yohimbacore Robusta™ Blend 256 mg	†
Green coffee extract (as <i>C. canephora robusta</i>) (seed)**	†
Yohimbe extract (as <i>Pausinystalia yohimbe</i>) (bark)	†
Supplying yohimbine	†
Norepidrol™ L-TML Blend 130 mg	†
L-tyrosine	†
L-methionine	†
L-leucine	†
Trans-ferulic acid	†
†Daily Value not established.	

FIGURE 3 Hydroxycut Hardcore ingredients as listed by the manufacturer

as cinchonidine from the olives and epigallocatechin-3-O-gallate (EGCG) from the green tea. Unfortunately, no tests could be performed to check for their presence in the actual medication, and they would not show in a routine drug screening test. Cinchonidine

is a quinidine that has proarrhythmic properties (Farkas, Leprán, & Papp, 2002), and EGCG is a negative chronotropic agent that can decrease the heart rate by exhibiting inhibitory action on several cardiac ion channels, in particular, the calcium channels in the atrial cells (Boukhabza et al., 2016; Han et al., 2016). It is important to note that slow and nonconducted P waves at a rate of 20–30 per minute during the episode of asystole could not be discerned with certainty (Figure 2). However, their existence at such a rate is suggestive of an inhibitory effect on the calcium channels present in both the sinus as well as the atrioventricular node. Thus, these chemicals could have accounted for our patient's symptomatic bradyarrhythmia and prolonged asystole.

4 | CONCLUSION

Hydroxycut products are among these dietary supplements that are labeled as nonconventional therapy or alternative medicine. They are easily accessible multicomponent drugs, with poorly studied safety profile and unproven efficacy. Bradyarrhythmia and life-threatening prolonged asystole are now added to the long list of possible adverse effects that can occur with the consumption of these products. In the end, our duty as physicians remains to advise, educate, and enlighten our patients on the risks of using such medications.

CONFLICTS OF INTEREST

None of the authors has any conflict of interest to disclose.

REFERENCES

- Boukhabza, M., El Hilaly, J., Attiya, N., El-Haidani, A., Filali-Zegzouti, Y., Mazouzi, D., & Amarouch, M. Y. (2016). In Silico evaluation of the potential antiarrhythmic effect of Epigallocatechin-3-Gallate on cardiac channelopathies. *Computational and Mathematical Methods in Medicine*, 2016, 7861653.
- Dara, L., Hewett, J., & Lim, J. K. (2008). Hydroxycut hepatotoxicity: A case series and review of liver toxicity from herbal weight loss supplements. *World Journal of Gastroenterology*, 14(45), 6999–7004.
- Farkas, A., Leprán, I., & Papp, J. G. (2002). Proarrhythmic effects of intravenous quinidine, amiodarone, D-sotalol, and almokalant in the anesthetized rabbit model of torsade de pointes. *Journal of Cardiovascular Pharmacology*, 39(2), 287–297.
- Flegal, K. M., Carroll, M. D., Kit, B. K., & Ogden, C. L. (2012). Prevalence of obesity and trends in the distribution of body mass index among US adults, 1999–2010. *JAMA*, 307(5), 491–497.
- Hammond, D. A., Thano, E., Bohnenberger, K. A., McAllister, M. W., Wannenburg, T., Hsu, S., ... Kim, R. (2015). Ventricular tachycardia precipitated by the use of the diet supplement Hydroxycut Gummies. *Hospital Pharmacy*, 50(7), 615–618.
- Han, J. Y., Moon, Y. J., Han, J. H., Kim, J. H., Woo, J. H., Yoo, H. S., ... Oh, K. W. (2016). Epigallocatechin-3-O-gallate (EGCG) attenuates the hemodynamics stimulated by caffeine through decrease of catecholamines release. *Archives of Pharmacal Research*, 39(9), 1307–1312.
- Karth, A., Holoshitz, N., Kavinsky, C. J., Trohman, R., & McBride, B. F. (2010). A case report of atrial fibrillation potentially induced by hydroxycut: A multicomponent dietary weight loss supplement devoid of sympathomimetic amines. *Journal of Pharmacy Practice*, 23(3), 245–249.
- Lobb, A. (2009). Hepatotoxicity associated with weight-loss supplements: A case for better post-marketing surveillance. *World Journal of Gastroenterology*, 15(14), 1786–1787.
- Morrow, J. D. (2008). Why the United States still needs improved dietary supplement regulation and oversight. *Clinical Pharmacology and Therapeutics*, 83(3), 391–393.
- Smith, M. W. (2013). *Hydroxycut: Uses, side effects, and risks*. WebMD. Retrieved from <http://www.webmd.com/diet/obesity/hydroxycitric-acid-hydroxycut>

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