

Caution: Energy drinks put individuals with genetic heart condition at risk

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Caffeinated energy drinks can trigger serious cardiac events including cardiac arrest in individuals not known to have a specific heart disease of genetic origin. Scientists in Australia have now assessed the risk of

cardiac events following consumption of energy drinks in patients diagnosed with congenital long QT syndrome (LQTS), a condition that affects 1 in 2000 and that can cause rapid, irregular heartbeat that can lead to sudden death. In their study, published in the *International Journal of Cardiology*, they report that even small amounts of energy drinks can cause changes in the heart that can lead to life-threatening arrhythmias and recommend cautioning young patients, some of whom may still be unaware of an existing heart condition, about the danger.

Used by millions, there has been an explosion in the consumption of "[energy drinks](#)" in the past 15 years, the most popular of which are Red Bull and Monster. The hemodynamic effects of [energy](#) drinks in healthy young adults have been assessed in prior studies with results including increased blood pressure, but no change in heart rate. This is the first study specifically designed to test the effects of these energy drinks in individuals who carry the gene faults (mutations) causing congenital LQTS.

"The potential cardiovascular risk of energy drinks continues to emerge as an important public health issue," explained lead investigator Professor Christopher Semsarian, MBBS, PhD, MPH, of the University of Sydney and Centenary Institute, Australia. "The population most at risk is teenagers and young adults, representing the population these drinks are most heavily marketed towards. Since energy drinks are widely available to all ages and over the counter, it is important that cardiovascular effects of these drinks are investigated."

The study was designed to assess the acute cardiovascular responses to energy drink consumption in patients with familial LQTS and to discover whether any identified cardiovascular effects correlate with changes in blood levels of the active ingredients - caffeine and taurine.

Investigators recruited 24 patients aged 16 to 50. More than half were

symptomatic before diagnosis and receiving beta-blocker therapy. Most had undergone genetic testing, 13 of whom had a documented pathogenic or likely pathogenic mutation.

Participants were assigned to energy drink or control drink groups for the first study visit. The energy drink consisted of two Red Bull sugar-free cans totaling 160mg of caffeine and 2000mg of taurine, totaling 500ml. The control drink was a cordial-based 500ml drink with no caffeine or taurine.

Electrocardiograms and blood pressure were recorded every 10 minutes, while signal-averaged electrocardiogram (SAECG) testing and repeat bloods were collected every 30 minutes for a total observation time of 90 minutes.

The results of the study show that three patients (12.5%) exhibited dangerous QT prolongation following energy drink consumption and two of the three had sharp increases in [blood pressure](#). These patients all had a documented family history of [sudden cardiac death](#) and two of them had previously experienced severe clinical manifestations and received an implantable cardioverter-defibrillator for recurrent syncope.

"Some individual patients may be at a higher risk," commented Professor Semsarian. "We therefore suggest caution in allowing the consumption of energy drinks in young patients with LQTS."

In an accompanying [commentary](#), Professor Peter J. Schwartz, MD, Head of the Center for Cardiac Arrhythmias of Genetic Origin, IRCCS Istituto Auxologico Italiano, Milan, Italy commented, "Data suggest that the majority of LQTS [patients](#) destined to become symptomatic have the first event well after having become a teenager, which implies that a significant number of youngsters with LQTS will help themselves to energy drinks without knowing their real condition and thus endangering

themselves."

"When something, in this case energy drinks, is ingested by millions of individuals all over the world, a percentage such as 12.5% is no longer small, and the findings deserve careful consideration," added commentary co-author Federica Dagradi, MD, of the Center for Cardiac Arrhythmias of Genetic Origin, IRCCS Istituto Auxologico Italiano. "We should avoid spreading unjustified alarms and fears, but at the same time, we should not ignore potential dangers."

More information: Belinda Gray et al, Cardiovascular Effects of Energy Drinks in Familial Long QT Syndrome: A Randomized Cross-Over Study, *International Journal of Cardiology* (2017). [DOI: 10.1016/j.ijcard.2016.12.019](https://doi.org/10.1016/j.ijcard.2016.12.019)

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