Red bulletin: caffeine-induced malignant ventricular arrhythmia in a young patient with arrhythmogenic cardiomyopathy

CASE REPORT

A 16-year-old male patient was referred following a syncopal episode and reported palpitations while playing sports. Echocardiogram revealed normal left-ventricular dimensions and function but an enlarged right ventricle with dyskinetic segments. Cardiac MRI confirmed these findings. At electrophysiological study, long runs of self-terminating atrial and ventricular tachycardia were inducible from the right-ventricular upper lateral wall. Arrhythmogenic cardiomyopathy was felt to be the likely diagnosis, and a dual-chamber cardioverter defibrillator was implanted. The patient was admitted 2 weeks later with six appropriate implantable cardioverter-defibrillator discharges for fast ventricular tachycardia (figure 1). The patient stated that in the few hours preceding implantable cardioverter-defibrillator discharges, he had been drinking a mixture of a Redbull energy drink and Buckfast tonic wine.

DISCUSSION

Arrhythmogenic cardiomyopathy is an inherited cardiomyopathy predominantly involving the right ventricle and characterised by right-ventricular dysfunction and ventricular arrhythmias. The prevalence of arrhythmogenic cardiomyopathy is between 1/1000 and 1/5000, with 10% of deaths occurring before age 19 and 50% before age 35.1

Emergency departments have reported increases in attendees with caffeine intoxication.2 Red Bull is an energy drink containing caffeine (80 mg/250 ml); Buckfast is a fortified wine with a caffeine content of 37.5 mg/100 ml. Caffeine is a xanthine alkaloid with psychoactive stimulant properties. Caffeine and its metabolites have multiple modes of action including non-selective antagonism of adenosine receptors and cAMP phosphodiesterase inhibition. Caffeine toxicity can result in serious arrhythmias in the normal heart; the presence of significant structural heart disease may exacerbate this tendency, with potentially fatal consequences.

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REFERENCES


Figure 1 Successful termination of ventricular tachycardia by implantable cardioverter-defibrillator; Rx, therapy delivery (35 J).