

# 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.<sup>1</sup>

Emergency departments have reported increases in attendees with caffeine intoxication.<sup>2</sup> 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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**Competing interests** None.

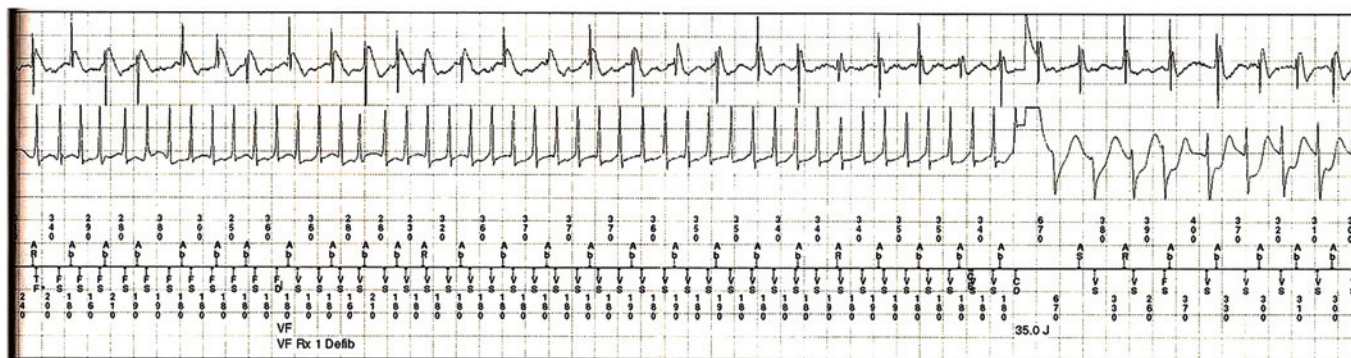
**Patient consent** Obtained.

**Provenance and peer review** Not commissioned; externally peer reviewed.

*Heart Asia* 2011;38. doi:10.1136/ha.2010.002659

## REFERENCES

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2. **Babu KM, Church RM, Lewander W.** Energy drinks: the new eye-opener for adolescents. *Clin Ped Emerg Med* 2008;9:35–42.



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