Case report

A 49-year-old man with dilated cardiomyopathy and an ICD received eight unsuccessful shocks for a single episode of ventricular tachycardia after excessive alcohol intake and exercise. The patient had low defibrillation thresholds just 8 days prior to his event during a routine 6-week postimplant electrophysiological study. Defibrillation threshold testing after his incident confirmed the low energy requirement for ventricular tachycardia termination. A previous animal study reported that intravenous ethanol elevates the defibrillation energy in a dose dependent manner. However, a recent study in humans showed that modest alcohol intake had no effect on defibrillator thresholds. This case report supports the animal data and suggests that excessive alcohol consumption can cause a life-threatening situation in ICD patients. (PACE 2002; 25:1144–1145)

Discussion

This report demonstrates a potential relationship between ethanol and defibrillation energy requirements in a patient with an ICD. Routine DFT testing just 8 days prior to hospital admission confirmed a DFT at 11 J. Although the patient had an elevated ethanol level, the authors can not ex-
Acute ethanol intoxication may indirectly stimulate the release of catecholamines and also causes an increase in duration of atrial and ventricular signal-averaged electrocardiograms. It is possible that this prolongation and a direct effect of ethanol on the heart may contribute to cardiac dysrhythmias. Other mechanisms like ethanol related electrolyte changes might be additionally involved. In rats treated with ethanol there was a high rate of isoproterenol induced ventricular fibrillation.

In animal studies intravenous ethanol elevates the defibrillation energy requirement in a dose related manner. Using a porcine model Kim et al., found that moderate ethanol concentrations (100 and 275 mg/dL) had no effect on DFT with the higher alcohol level group approaching statistical significance. An alcohol concentration of 400 mg/dL was associated with a significant increase in DFT by 32%. Strickberger et al. evaluated the effect of intravenous ethanol infusion in humans with a recently implanted ICD. Since a blood ethanol level of 95 ± 44 mg/dL had no effect on DFTs, the authors concluded that modest consumption of alcohol would be safe in patients with an ICD. However, the investigators did not address the effect of higher levels of alcohol on DFTs. The current case supports the animal data and demonstrates that excessive alcohol intake in humans may render ICD therapy ineffective in patients with dilated cardiomyopathy and life-threatening ventricular arrhythmias.

References