Efficacy of flecainide in a patient with catecholaminergic polymorphic ventricular tachycardia

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We present a case of a 32-year-old woman with catecholaminergic polymorphic ventricular tachycardia, who could not be treated with beta-blockers because of serious side effects (psychotic symptoms). Flecainide was used, resulting in almost full suppression of arrhythmia.

A 32-year-old woman with palpitations on exertion was referred to hospital with the suspicion of long QT syndrome. The clinical examination was normal. Electrocardiogram showed sinus rhythm with frequent premature ventricular beats (PVBs), pairs, and episodes of non-sustained polymorphic ventricular tachycardia (VT). PQ, QRS, and QT in sinus rhythm were normal. Arrhythmic episodes were more frequent during physical exertion. Twenty-four hour Holter monitoring revealed 19 000 PVBs, 327 short episodes of bidirectional and polymorphic VT with a maximum frequency of 170 per minute, predominantly during activity (Figure 1A). Echo was normal. Catecholaminergic polymorphic ventricular tachycardia (CPVT) was diagnosed.

The patient was given propranolol 120 mg per day with good result (1500 PVB, 55 episodes of VT, 150 per minute per 24 h, bigeminy in the exercise test). Because of severe sleep disturbances (psychotic symptoms), propranolol was replaced by bisoprolol and subsequently by atenolol. No improvement was observed during beta-blocker (BB) therapy. Propafenone (225 mg per day) was proarrhythmic (frequent VT in standard ECG and exercise test). Ablation of trigger in the left ventricle was attempted, but without success. We decided to combine bisoprolol (the only BB well tolerated by the patient) with flecainide [50 mg BiD (twice a day)]. On the third day of the therapy, arrhythmia was suppressed and could not be induced by exertion (Figure 1B). The effect was sustained during 3 months of observation.

Figure 1 Twenty-four hour Holter ECG monitoring. (A) Before treatment (13 October 2009): 19 500 premature ventricular beat, 327 short episodes of polymorphic and bidirectional ventricular tachycardia, more frequent during activity. (B) Third day of flecainide therapy (27 November 2009). Sinus rhythm, almost full suppression of arrhythmia.

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Germline and somatic mosaicism for a mutation of the ryanodine receptor type 2 gene: implication for genetic counselling and patient caring

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We identified a heterozygous p.Arg2401His mutation of RYR2 by sequencing the DNA of a 7-year-old girl who was referred for catecholaminergic polymorphic ventricular tachycardia (CPVT). Using high-resolution melting assay, we have demonstrated a mosaicism for this mutation in her asymptomatic mother which illustrates the benefit of extensive genetic analysis in CPVT, in particular regarding genetic counselling.

Catecholaminergic polymorphic ventricular tachycardia (CPVT) is a rare familial arrhythmogenic disease, characterized by syncpe or sudden death induced by emotional or physical stress. The mortality rate in untreated individuals ranges from 30 to 50% by the age of 40. Since β-blockers and/or implantable cardioverter-defibrillator (ICD) can partially prevent arrhythmias and sudden death, early diagnosis through clinical and genetic screening is therefore essential. Mutations in the cardiac isoform of the ryanodine receptor gene (RYR2) have been associated with autosomal dominant forms of CPVT.

We report here the case of a 7-year-old girl referred for CPVT after recurrent syncpe and positive exercise stress test. Ventricular salvos, initially suppressed by nadolol, recurred at age 13, despite an increased dosage and an ICD were implanted. Catecholaminergic polymorphic ventricular tachycardia was also strongly suspected in her youngest brother who died suddenly at age 10 while running during a soccer game. All other family members were asymptomatic and had negative stress tests (Figure 1A).

After written informed consent, RYR2 genetic analysis was performed by direct sequencing in patient’s DNA and a heterozygous c.7202G>A; p.Arg2401His mutation in exon 47 was identified (Figure 1B). This mutation occurred in a highly conserved amino acid position, was not observed among 300 control chromosomes, and has been already reported in association with CPVT.

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