

## EHRA EDUCATION COMMITTEE

# A family with abnormal electrocardiograms: part I

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A 40-year-old woman (Patient 1) had a broad complex tachycardia with left bundle branch block morphology and right axis compatible with ventricular tachycardia. Her electrocardiogram (ECG) was abnormal (*Figure 1*). An echocardiogram revealed a moderate depressed left ventricular function, especially wall motion disturbances in the inferoposterolateral part with an ejection fraction of 40%. The right ventricle had mild segmental dilatation and a right ventricular ejection fraction of 40%. The signal-averaged ECG was normal. A brother died suddenly at the age of 45 years.

Because of the suspicion of the hereditary disease, her 21-year-old son (Patient 2) agreed for cardiac evaluation. His ECG is presented in *Figure 2*. His echocardiogram, 24 h ambulatory monitoring (only one ventricular premature

beat), and exercise test were within normal limits. A late potential was present during signal-averaged ECG.

Cardiac evaluation was suggested to a 46-year-old sister (Patient 3) without physical complaints. Her ECG is presented in *Figure 3*. The echocardiogram showed a dilated left ventricle with depressed function and an ejection fraction of 30%. A late potential was present during signal-averaged ECG. Twenty-four-hour ambulatory monitoring registered one triplet and 2500 ventricular premature beats and 24 doublets. During exercise testing polymorphic ventricular premature beats and doublets occurred. Her identical twin sister (evaluated by co-worker H. Heidbuchel, University of Leuven, Leuven, Belgium) had exactly the same ECG.

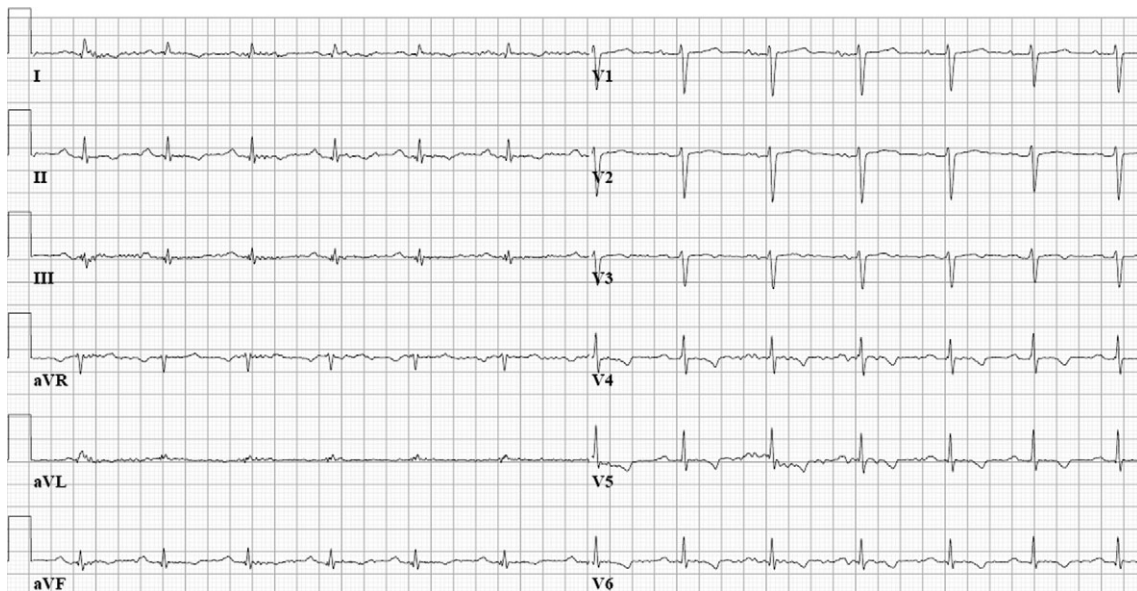


Figure 1 Electrocardiogram of patient 1.

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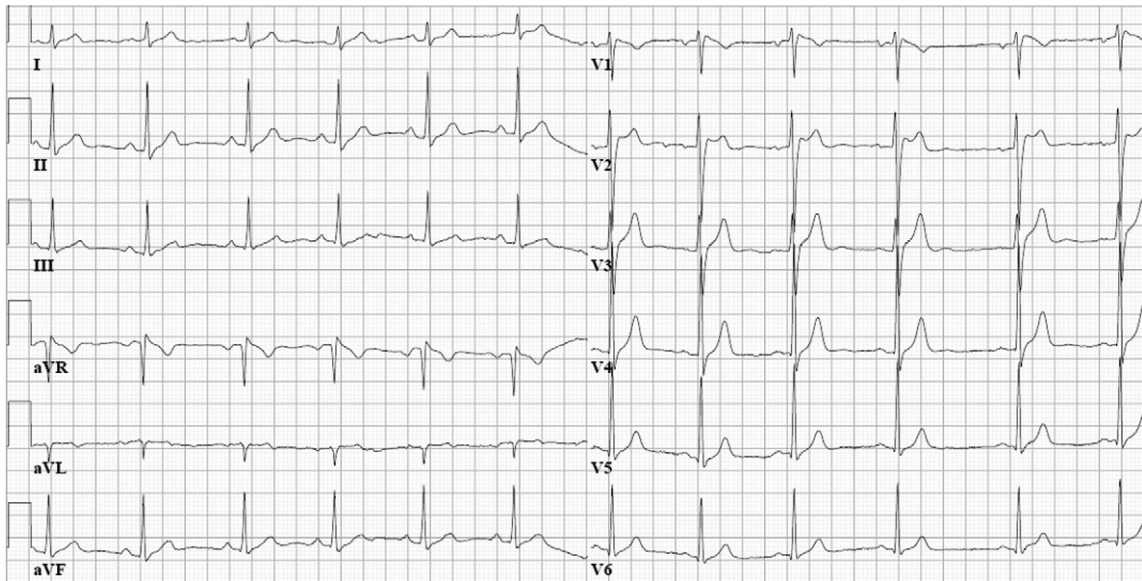


Figure 2 Electrocardiogram of patient 2.

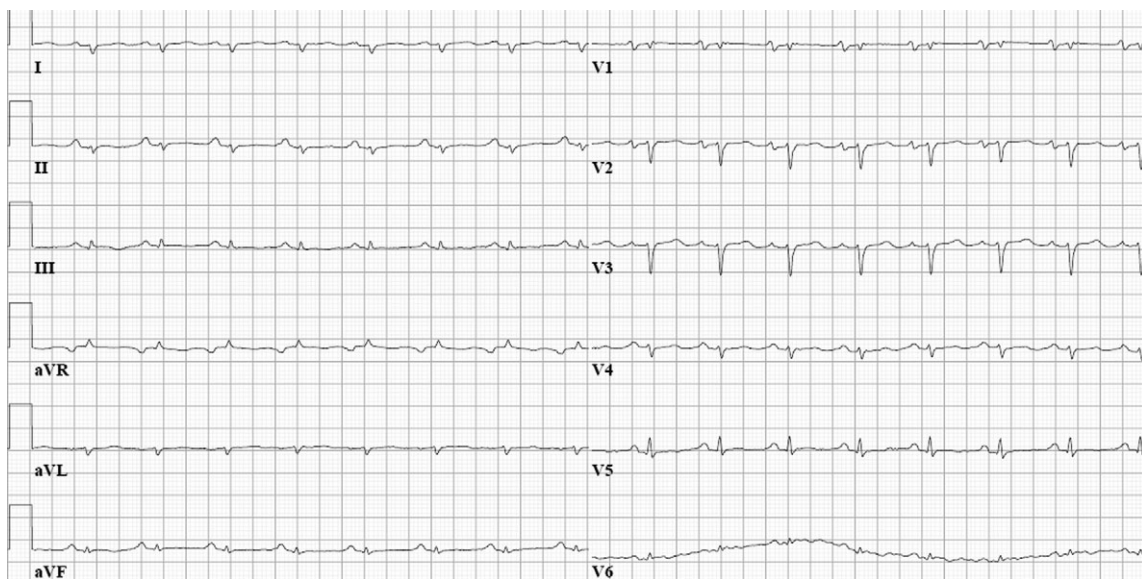


Figure 3 Electrocardiogram of patient 3.

## Questions

- (1) What abnormalities are seen in the presented 12-lead electrocardiograms? Can these abnormalities be explained by the same disease?
- (2) What additional investigations are possible in Patients 1, 2, and 3?
- (3) What kind of (anti-arrhythmic) therapy is possible in Patients 1, 2, and 3?

For answers see page 1244.