

# Autonomic Imbalance and QT Dynamics in Idiopathic Ventricular Fibrillation

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## Abstract

**Introduction:** The incidence of early repolarization in the inferior and /or lateral leads (ILER) is reported to have a relatively high prevalence in patients with idiopathic ventricular fibrillation (IVF). However, its clinical, electrocardiographic, and autonomic characteristics are not fully understood.

**Subjects and Methods:** The present study included 18 patients with IVF and 21 normal subjects without structural heart disease and cardiac symptoms as Controls. The clinical and electrocardiographic characteristics in idiopathic VF patients were evaluated and the QT dynamics and heart rate variability were analyzed using 24-hour Holter ECG recordings obtained during daytime and nighttime.

**Results:** No family history of sudden cardiac death (0/18, 0%) or ILER (8/18, 44%) were detected in 18 IVF patients. Of the total 18 first cardiopulmonary arrest episodes due to spontaneous VF in each patient, 10/18 (56%) episodes were detected during nighttime or at rest. The QT/RR slope during daytime was significantly steeper than that during nighttime in the Control subjects ( $0.19 \pm 0.14$  vs.  $0.13 \pm 0.09$ ,  $P=0.012$ ), but not in the IVF patients. There were significant diurnal differences in the high-frequency (HF) and low-frequency (LF)/HF ratios in the Control subjects ( $238.6 \pm 276.2$  vs.  $506.4 \pm 524.8$  ms<sup>2</sup>,  $P=0.001$  and  $3.8 \pm 1.8$  vs.  $2.4 \pm 1.6$ ,  $P=0.027$ , respectively), but not in the IVF patients. The LF/HF ratios during nighttime in the IVF patients were significantly higher than in the Control subjects ( $3.7 \pm 2.3$  vs.  $2.4 \pm 1.6$ ,  $P=0.048$ ).

**Conclusion:** More than half of the first cardiopulmonary arrest episodes occurred during nighttime or rest in IVF patients. The elevated nocturnal sympathetic tone may play an important role in the occurrence of VF in these patients.

**Key words:** Autonomic tone; Idiopathic ventricular fibrillation; QT dynamics