

# **Arrhythmogenic activity of cardiac muscle in pulmonary veins of the dog: implication for the genesis of atrial fibrillation**

陳亦仁

Chen YJ;Chen SA;Chang MS;Lin CI.

摘要

## **Abstract**

**OBJECTIVE:** Pulmonary veins are important foci of ectopic beats to initiate paroxysmal atrial fibrillation. The purpose of this study were to investigate the electrophysiological characteristics of excitable cells in canine pulmonary veins obtained from healthy and chronic rapid atrial pacing dogs and their responses to cardioactive agents. **METHODS:** Transmembrane action potentials (APs) were recorded from multiple sites of pulmonary veins isolated from 17 healthy dogs and 14 dogs with chronic (6-8 weeks) rapid atrial pacing (780 bpm). **RESULTS:** In normal superfusate, several types of electrical activities were identified, including silent electrical activity, fast response APs driven by electrical stimulation, and spontaneous fast or slow response APs (with or without early afterdepolarizations). The incidences of AP with an early afterdepolarization (93% versus 41%) was greater in chronic pacing dogs. The spontaneous activities were depressed by beta-adrenoceptor blocker, calcium channel blocker, adenosine and acetylcholine. High frequency (>8 Hz) irregular rhythms occurred spontaneously or were induced by cardioactive agents or electrical stimuli. The incidence of spontaneously occurring tachyarrhythmias was much higher in preparations from chronic pacing dogs (93%) than from control (12%). The tachyarrhythmias were suppressed by sodium channel blocker, potassium channel blocker or magnesium. **CONCLUSIONS:** Pulmonary veins have arrhythmogenic ability through spontaneous activities or high-frequency irregular rhythms. The higher incidence of spontaneously occurring high-frequency irregular rhythms in chronic rapid atrial pacing dogs may account for the increased risk of atrial

fibrillation in these dogs.