



## Anti-arrhythmic and anti-inflammatory effect of low-level electrical stimulation of aortic root ventricular ganglionated plexi in dogs with heart failure

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### Abstract

Heart failure (HF) and arrhythmia often coexist and share the similar underlying pathogenesis, including autonomic imbalance, electrical remodeling, and inflammatory reactions. Low-level electrical stimulation (LL-ES) rebalances the tone of the autonomic nervous system and has an anti-arrhythmic effect. However, it is unknown whether LL-ES can decrease the inflammatory response and benefit patients suffering from both HF and arrhythmia. This study aimed to investigate the anti-arrhythmic and anti-inflammatory effects of LL-ES of aortic root ventricular ganglionated plexi (ARVGP). Twenty dogs were divided randomly into drug administration (control) and LL-ES groups after performing rapid right ventricle pacing to establish the HF model. The inducing rate of arrhythmia was measured after a programmed electrical procedure at the baseline and drug administration or LL-ES. The bioactive factors of HF, including angiotensin II, TGF- $\beta$ , mitogen-activated protein kinase (MAPK), and matrix metalloproteinase (MMP), were assessed. Furthermore, ventricular size and left ventricular ejection fraction were determined. Compared with the control group, the inducing rate of arrhythmia decreased from 40% to 10% after 4 h of LL-ES ( $P < 0.05$ ). The expression of angiotensin II, TGF- $\beta$ , MAPK, and MMP was downregulated significantly in the LL-ES group ( $P < 0.05$ ). Moreover, the volume of the left ventricle and the ejection fraction of the left ventricle in the LL-ES group changed little ( $P > 0.05$ ). Short-term LL-ES of ARVGP presented both anti-arrhythmic and anti-inflammatory effects and contributed to the treatment of HF and the associated arrhythmia.

### Biography

Hong-tao Wang, MD, an associate chief physician in division of cardiology, the Second Affiliated Hospital of Xi'an JiaoTong University. A member of Asia Pacific Heart Rhythm Society (ID number: 108600896). Focused on the mechanism and management of the role of autonomic nervous system in the initiation and maintenance of atrial fibrillation. Published 2 papers collected by SCI as the first author (IF=4.2 and 1.3). Moreover, a paper was just published by JACC Clinical Electrophysiology in 2015. Gained Shaanxi Natural Science Fund in 2015.

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7<sup>th</sup> Annual Congress on Cardiology and Cardiac Surgery  
Edinburgh, June 15, 2020

**Citation:** Hong-Tao Wang: *Anti-arrhythmic and anti-inflammatory effect of low-level electrical stimulation of aortic root ventricular ganglionated plexi in dogs with heart failure*, Cardiac Surgery 2020, 7<sup>th</sup> Annual congress on Cardiology and Cardiac Surgery, Edinburgh, June 15, Pages-9