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## 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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**Background & Aim:** 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).

**Method:** 20 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 Metallo Proteinase (MMP), were assessed. Furthermore, ventricular size and left ventricular ejection fraction were determined.

**Result:** 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 down regulated 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 ( $P > 0.05$ ).

**Conclusion:** 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.

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