

**Objectives** To dynamically observe the mechanism of connective tissue growth factor and nerve remodelling in the atrial fibrillation rabbit models.

**Methods**

- (1) Ninety-six rabbits were randomly divided into two groups: control group (n=48) were not paced, AF group (n=48) underwent rapid atrial pacing, and each group were divided into 6 subgroups, 4 h group, 8 h group, 12 h group, 16 h group, 20 h group and 24 h group (n=8, respectively). The changes of AF inducibility, effective refractory period (ERP), dispersion of ERP, rate-adaptation of AERP and heart rate variability (HRV) were examined before pacing and after pacing.
- (2) Left and right atrial diameter and left ventricular ejection fraction (EF) were examined by cardiac ultrasonography. Plasma concentration of CTGF was detected by ELISA. (3) The changes of CTGF and nerve growth factor (GAP-43, ChAT, TH) was detected by immunohistochemistry.

**Results**

- (1) After pacing 8 h, atrial fibrillation inducibility was significantly increased, duration of AF was significantly prolonged, AERP was significantly shortened, dispersion of AERP was significantly decreased and the rate-adaptation of AERP was significantly increased.
- (2) The left and right atrial volume were enlarged with the pacing prolonging, but there was no significance ( $p>0.05$ ). The EF at pacing 12 h was significantly decreased  $p<0.05$ .
- (3) The plasma and tissue CTGF levels at pacing 16 h were significantly progressively increased  $p<0.05$ .
- (4) HRV frequency domain, the LF and HF at pacing 8 h and 12 h were significantly increased  $p<0.05$ , the increasing of LF and HF reached a peak at 16 h and gradually decreased later. In AF group, the LF / HF was increased to the highest values ( $p>0.05$ ) at 4 h, and then decreased to the lowest values ( $p>0.05$ ).
- (5) GAP-43, TH and ChAT positive nerve density in left and right atria were significantly increased at pacing 12 h  $p<0.05$  and then gradually increased. However, the TH-positive nerve density in right atrium was higher than the left atrium, but the difference was not significant ( $p>0.05$ ).

**Conclusions**

- (1) CTGF increased after rapid atrial pacing 16 h, which indicating myocardial fibrosis.
- (2) Neural remodelling occurred after rapid atrial pacing 16 h, and vagal nerve tone was dominant.
- (3) The changes of CTGF and HRV were consistent, which may be used to predict the myocardial fibrosis development of atrial fibrillation.

GW23-e1971

**THE TIME-DEPENDENT STUDY ON CONNECTIVE TISSUE GROWTH FACTOR AND NERVE REMODELLING IN ATRIAL FIBRILLATION**

doi:10.1136/heartjnl-2012-302920a.146

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