MOLECULAR MECHANISMS OF IONIC REMODELING IN L-TYPE VOLTAGE DEPENDENT CALCIUM CHANNEL OF AGE-RELATED CHANGE IN ATRIAL OF CANINE

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Purpose
The present study aims to investigate the molecular basis of L-type voltage dependent calcium channel (LVDCC) in adult and aged canine.

Methods
The action potential duration (APD_{90}), amplitude of action potential plateau, I_{Ca,L} peak current density were recorded by patch clamp technique. The mRNA gene and protein expression levels of α_{1c} subunit (CaV1.2), sarcoplasmic reticulum Ca^{2+}-ATPase (SECRa_{2}), Calpain-I, ryanodine receptor (RyR_{2}) were detected by semi-quantitative RT-PCR.

Results
- Peak current density was (-14.04±0.82 pA/pF) in adult group compared with (-8.11±0.54 pA/pF, p<0.05) in the aged group.
- APD_{90} of aged group was significantly decreased.
- The mRNA gene expression levels of CaV1.2 was significantly lower in the aged dogs (0.9±0.35) than in the adult dogs (2.38±0.4, p<0.05).
- The mRNA gene expression levels of RYR_{2} was significantly higher in the aged dogs (4.39±4.68) than in the adult dogs (1.49±1.69, p<0.05).
- There were not significantly different gene expression levels of SECRA_{2} and Calpain-I in two groups.
- The protein expression levels of CaV1.2 were significantly lower in the aged dogs than in the adult dogs (0.13±0.10 vs 0.29±0.12, p<0.05).
- The protein expression levels of RYR_{2} was significantly higher in the aged dogs than in the adult dogs (0.18±0.21 vs 0.08±0.36, p<0.05).

Conclusion
These data suggest that the change of mRNA and protein expression of CaV1.2 and RYR_{2} of LVDCC may serve as the molecular basis of I_{Ca,L} remodeling respectively in aged dogs. This plays an important role in the predisposition to developing atrial fibrillation (AF) due to ageing.