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CHANGES IN THE AGEING-ASSOCIATED OF L-TYPE CALCIUM CHANNEL OF THE LEFT ATRIA OF THE CANINES

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Purpose Action potential (AP) contours vary considerably between normal adult and aged left atrial fibres. The ionic and molecular bases for these differences remain unknown. So we investigate whether the L-type calcium current (I_{CaL}) and L-type calcium channel of left atria may be altered with age.

Method We used whole-cell patch-clamp to record action potential (AP) and I_{CaL} in left atrial (LA) cells dispersed from normal adult (2 to 2.5 years) and older canines (>8 years). The α_1c (Cav1.2) subunit of L-type calcium channel mRNA and protein expression were assessed by real-time quantitative RT-PCR and Western blotting respectively.

Results Whereas the potential remains, AP amplitude and V_{max} did not differ with age, the plateau was more negative and AP duration was max longer in old tissue. Aged LA cells have lower peak I_{CaL} current densities than Adult LA cells ($p < 0.05$). There were no significant differences in half-activation voltage, half-inactivation voltage and recovery time from inactivation. In addition, compared to the adult group, the Cav1.2 mRNA and protein expression of LA decreased in the aged group.

Conclusions The lower plateau potential of AP and the decreased I_{CaL} of LA in aged canines may contribute to the slow conduction and discontinuous conduction of LA. These changes increased susceptibility of aged atria to atrial fibrillation. At the same time, the decreased expression of Cav1.2 with age may be the basis of the decrease of I_{CaL} with age.