PO1-2-36 Poster session

D-Ala, D-Leu Enkephalin Delays Ouabain-Induced Arrhythmia In Isolated Rat Atria

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Background: Opioid receptor stimulation inhibits voltage-gated calcium channels causing the opening of potassium channels thereby inducing membrane hyperpolarization. Also, it has negative inotropic effect on the heart. The cardiac glycoside, ouabain induces cell membrane depolarization that leads to ouabain-induced arrhythmia. This study was aimed to explore the antiarrhythmic activity of the specific delta opioid receptor agonist, D-Ala, D-Leu Enkephalin (DADLE) on ouabain-induced arrhythmia in rat atria.

Methods: Eighteen male rats including the control and DADLE-incubated (100 nM or 1 µM) ouabain-stimulated groups were used. After induction of anesthesia, the atria were isolated and the onset of arrhythmia and asystole as well as atrial beating rate were measured following incubation with DADLE and stimulation by ouabain using standard organ bath. For statistical analyses, unpaired Student's t-test was used to compare the time of onset of arrhythmia or asystole as well as atrial beating rate and contractile force between treatments and control groups. Paired Student's t-test was carried out to find the effects of ouabain on atrial beating rate and contractile force within groups. P values less than 0.05 were considered statistically significant.

Results: DADLE postponed the onset of arrhythmia compared to control group, significantly ($P<0.01$). Incubation of ouabain increased the atrial bearing rate, significantly ($P<0.05$), while pretreatment of isolated atria with DADLE in both concentrations could reverse it, significantly.

Conclusions: It is concluded that DADLE can effectively diminish the ouabain-induced arrhythmia in rats. Such results might be attributed to hyperpolarization of cell membrane or reduction of ouabain toxicity in myocardium, which needs for further experiments.