RAP+BRL+SR group was significantly increased ($p<0.01$), NO production, cGMP content and PKG protein expression of RAP+BRL+SR group were significantly decreased ($p<0.001$, $p<0.01$, $p<0.05$).

Conclusions Activation of β_3-ARs can decrease $I_{Ca,L}$ of rabbits atrial myocytes by rapid atrial pacing, this role of β_3-ARs may be through NO-cGMP-PKG signal pathway, can aggravate atrial electrical remodelling, promote the generation and maintenance of AF.

Cardiovascular disease basic research

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THE EFFECT OF B3-ADRENERGIC RECEPTORS ON L-TYPE CALCIUM CURRENT IN THE ATRAIL MYOCYTES OF RAPID ATRAIL PACING RABBITS AND THE MECHANISM

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Objective Stimulation of β_3-adrenergic receptors (β_3-ARs) induces, as in ventricular cardiomyocytes, a negative inotropic effect and a decrease in L-type calcium current ($I_{Ca,L}$) amplitude mediated through the Gi-NO pathway. The purpose of this study was to investigate the effect of β_3-ARs on $I_{Ca,L}$ in the atrial myocytes of rapid atrial pacing (RAP) rabbits and the possible signal pathway during the process. To provide new views for the mechanism and treatment of atrial fibrillation (AF).

Methods A. Ex vivo part: (1) Establish RAP model (n=7): Rabbits were paced at 600 beats per min for one week. (2) Atrial myocytes were isolated. (3) The density of $I_{Ca,L}$ was tested: After forming whole cell configuration, recorded $I_{Ca,L}$ (RAP group); atrial myocytes were treated with β_1, β_2-ARs blocker Nadolol and β_3-ARs agonist BRL 37344 (BRL), recorded $I_{Ca,L}$ (RAP+BRL group); and finally, incubated by β_3-ARs selective antagonist SR 59230A (SR), then recorded $I_{Ca,L}$ (RAP+BRL+SR group). B. In vivo part: (1) Establish RAP model. (2) The rabbits were randomly divided into three groups: (i) RAP group (n=7): This group was given RAP for one week; (ii) RAP+BRL group (n=7): After one week of RAP, this group was given Nadolol and BRL; (iii) RAP+BRL+SR group (n=7): After one week of RAP, the rabbits were given Nadolol, BRL and SR. (3) Nitric oxide (NO), cyclic guanosine monophosphate (cGMP) and the protein expressions of cGMP-dependent protein kinases (PKG) were measured.

Results (1) Comparing with RAP group, the density of $I_{Ca,L}$ of RAP+BRL group was significantly decreased ($p<0.01$), NO production, cGMP content and PKG protein expression of RAP+BRL group were significantly increased ($p<0.05$). (2) Comparing with RAP+BRL group, the density of $I_{Ca,L}$ of