INFLUENCE OF A NEW PROPRANOLOL ANALOGUE ON THE RABBIT MYOCARDIUM IN VITRO

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Experiments with electrophysiology of the heart have been essential for the progress in diagnostics and pharmacotherapy of cardiovascular diseases. The aim of the study was to establish the influence of a new propranolol analogue on mechanical and bioelectrical activity of the rabbit heart in vitro. In the experiment, propranolol (1-isopropylamino-3-[1-naphthoxy]-2-propanol hydrochloride) and its newly synthesized analogue (1-[1,1-dimethyl-ethylamino]-3-[1-naphthoxy]-2-propanol hydrochloride) were used. Atrial trabecules were cut from right rabbit atrium. Each preparation consisted of cardiacmyocytes and sino-atrial node cells. Preparations were stimulated with square pulses of direct current at a voltage of 20V, rate of 2 Hz and 1 ms duration. Propranolol and its analogue were applied at gradded concentration $10^{-6}$ M, $10^{-5}$ M, $10^{-4}$ M, $10^{-5}$ M, $10^{-6}$ M and $10^{-7}$ M. Mechanical (force of contraction, time of contraction and relaxation) and bioelectrical (amplitude and duration of action potentials) activities were examined. Bioelectrical activity of preparations was recorded using intracellular microelectrodes. LD₅₀ for new analogue was determined. Analogue diminished force of contraction and shortened time of contraction and relaxation of myocardium and decreased amplitude and duration of action potentials in sino-atrial node cells. It influenced mechanical and bioelectrical parameters to lesser degree than propranolol.

Key words: electrophysiology, myocardium, β-adrenoceptor, propranolol, propranolol analogue

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