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The action of β-receptor antagonists on intracellular cardiac potentials.

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Dohadwalla, Freedberg & Vaughan Williams (1969) have reported that in isolated rabbit atria, 60 min exposure to (−)-, (+)- and (±)-propranolol and practolol (I.C.I. 51072) greatly reduced the rate of rise (MRD) of the intracellularly recorded action potential at concentrations which had no significant effect on contractility, repolarization time and other cardiac parameters. They concluded that the MRD "was by far the most sensitive test of the activity of the drugs on cardiac function".

In the present experiments, (±)-propranolol ($1{\cdot}0\times10^{-5}$M) after 10 and 20 min exposure decreased the MRD and amplitude of the action potential and depressed contraction in rabbit atria, which agrees with the above results. However, in some experiments (±)-propranolol ($1{\cdot}0\times10^{-6}$M) caused a significant increase in MRD and action potential amplitudes in spite of a significant depression of the contractile response.

In other experiments, however, notably with 10^{-6}M propranolol on spontaneously beating guinea-pig atria, and with 10^{-5}M practolol on driven guinea-pig atria, MRD was reduced to a greater extent than contractions. Similar results were obtained with (±)-propranolol ($1{\cdot}0\times10^{-6}$M) in guinea-pig atria driven at 60/min (left atria) and at 180/min (combined right and left atria). At a higher concentration ($1{\cdot}0\times10^{-5}$M) of (±)-propranolol there were no differences in the electrophysiological parameters from control values in these preparations.

Practolol and oxprenolol, two other β-receptor blocking agents, had almost no effect (even at concentrations much greater than that necessary to cause substantial ß-receptor blockade) on MRD, action potential size, or configuration of the action potential when tested on guinea-pig left atria.

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The effects of intravenous acetylcholine on the cardiovascular system of the anaesthetized dog.

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The fall in systemic blood pressure following the intravenous administration of acetylcholine was found not to be associated with a direct effect of acetylcholine on resistance in the femoral vasculature.