In vitro inhibitory effects of chebulinic acid on the contractile responses of cardiovascular muscles.

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Abstract

1. The effects of chebulinic acid, which has been shown to elicit blood pressure lowering effect in rats, on aortic vascular contraction as well as cardiac contraction were studied in rats. 2. Chebulinic acid had no effect on KCl-induced aortic contraction, but irreversibly inhibited the contractile responses to phenylephrine in an apparently non-competitive manner. Chebulinic acid also inhibited contractile responses of rat aorta to 5-hydroxytryptamine and angiotensin II. 3. Chebulinic acid inhibited the binding of [3H]-prazosin to dog aortic microsomal membranes in a concentration-dependent manner with an IC50 value of 0.34 mmol/L. Results of saturation binding experiments suggest a mixed mode of inhibition by chebulinic acid (i.e. a decrease in both the maximal number of binding sites and the affinity for prazosin). 4. Chebulinic acid concentration-dependently and reversibly inhibited the maximal left ventricular pressure of rat heart in a Langendorff preparation with 50% inhibition occurring at a concentration of 0.3 nmol/L. 5. We conclude that chebulinic acid exerts non-specific inhibitory actions in vascular preparations. Its inhibitory effect on cardiac contraction was reversible and three orders of magnitude more potent than that on vascular contraction. We suggest that the hypotensive effect of chebulinic acid is probably mediated via the decrease in cardiac output resulting from reduced left ventricular contraction.