Dual inotropic effect of harmaline on the rat heart atrial muscle

Carpenter, Robert

Diaz, Gabriela

The effect of harmaline (HME) was analyzed in rat strips superfused in vitro. A dual inotropic action was found: the positive component was due to a transient catechol-mediated enhancement of the velocity of development of tension (dT/dt) and to a prolongation of the duration of the rising phase of the contraction (TPT). The negative component was due to a depression of dT/dt, which overcame the persistent TPT-prolonging effect of HME, and it was abolished by rising the [K]0. It is concluded that: (1) the positive inotropic effect of HME depends on its actions on the dT/dt and TPT; (2) the enhancement of dT/dt is due to an adrenergic mechanism, which stimulates the Ca2+-dependent slowly activated current (Is); (3) a negative inotropic effect becomes evident whenever the dT/dt is depressed by the drug, regardless of the persistence of the TPT-prolonging effect; (4) the depression of the dT/dt is not due to an inhibition of Is. © 1977.