EFFECTS OF AMPHETAMINE AND ITS STRUCTURALLY RIGID DERIVATIVES ON THE STEREOTYPED CLIMBING BEHAVIOUR OF MICE

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The dopamine-like activity of S-(+)-amphetamine (d-Am) was compared with that of the more rigid 2-aminoindane (2-Ai) and the endo and exo-isomers of N-methyl-2-aminobenzonorbornene (2-Ab) by measuring stereotyped climbing behaviour (Farrant et al 1977). 15 Min prior to subcutaneous injection of test drug, mice were 'primed' with L-dopa (150 mg kg and benserazide (30 mg kg) (Protais et al 1976). Climbing behaviour was measured at 10 min intervals for 1h. The effects of the sympathomimetics are compared in Fig. 1.

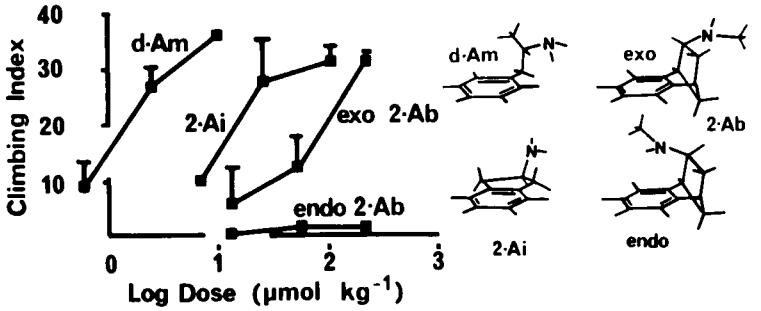

Fig. 1. The effects of d-amphetamine, 2-aminoindane and the exo and endo isomers of N-methyl-2-aminobenzonorbornene on climbing behaviour in groups of 8 mice between 30 and 40 min following injection. The Climbing Index is in arbitrary units based on a constant background activity of control mice. Limits are + s.e.m.

d-Am, 2-Ai and exo-2-Ab induced climbing. Higher doses inhibited activity (not shown). Climbing behaviour was abolished by droperidol (0.5 mg kg). The endo isomer of 2-Ab did not induce stereotyped climbing.

The differences between the isomers are compatible with our previous report of differences in their sympathomimetic activities in vitro (Burn et al 1980), and the conclusion that catecholamine releasing activity resides in the analogue structurally similar to the anti-conformation of amphetamine (as drawn in Figure 1) (Wood et al 1981).

When the effects of the isomers on locomotor activity, pain perception and appetite are compared, the qualitative differences imply differing involvements of dopamine in the actions of centrally-acting sympathomimetics.

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