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Effect of amphetamine and reserpine on the pressor response to tyramine in the rabbit and cat

SIR,—The potentiation of the pressor response to tyramine after amphetamine has been shown in the dog (Eble & Rudzik, 1965) and in the rat (Eble & Rudzik, 1966a). However, combinations of amphetamine and reserpine antagonise the pressor response to tyramine in the dog (Eble & Rudzik, 1966b). In these studies of the interactions of amphetamine and tyramine in other species it was found that in the rabbit, tyramine was a relatively weak pressor agent and that its effect was not potentiated by amphetamine, but was blocked by combinations of amphetamine and reserpine. The pressor responses of the cat to tyramine and the interaction with amphetamine and reserpine were similar to those found in the dog but not like those found in the rabbit.

Rabbits (3-5 kg) and cats (1·8–3·6 kg) of either sex were anaesthetised with sodium pentobarbitone (32 mg/kg, i.v.), with supplements of 3·2 mg/kg as required. Blood pressures were recorded from the carotid artery and drug injections made through a polyethylene tube passed 3 to 5 cm into a femoral vein.

(+)-Amphetamine (250 or 500 μg/kg, i.v.) failed to potentiate the pressor response to tyramine in rabbits (Table 1). In two additional experiments larger

TABLE 1. EFFECT OF AMPHETAMINE AND RESERPINE ON THE PRESSOR RESPONSE TO TYRAMINE IN THE RABBIT

Treatment	No. of Determinations	Mean b.p. response to tyramine (250–500 μg/kg, i.v.)	P value
Control	5	31 ± 5·9	
After amphetamine (250 μg/kg, i.v.)		36 ± 4·9	> 0·1
After amphetamine (250 μg/kg, i.v.) + reserpine (1 mg/kg, i.v.)		51 ± 4·5	< 0·02
Control	7	21 ± 3·0	
After amphetamine (500 μg/kg, i.v.)		28 ± 4·2	> 0·1
After amphetamine (500 μg/kg, i.v.) + reserpine (1 mg/kg, i.v.)		45 ± 4·6	< 0·01
Control	5	41 ± 5·4	
After reserpine (1 mg/kg, i.v.)		56 ± 10·1	> 0·05
After reserpine (1 mg/kg, i.v.) + amphetamine (250 μg/kg, i.v.)		28 ± 3·4	< 0·05
Control	5	30 ● 5·0	
After reserpine (2 mg/kg, i.v.)		62 ± 7·6	< 0·02
After reserpine (2 mg/kg, i.v.) + amphetamine (250 μg/kg, i.v.)		30 ± 5·0	< 0·001

doses of amphetamine (1 mg/kg, i.v.) also failed to potentiate the pressor response to tyramine. The response after reserpine in the amphetamine-pretreated rabbits, was further potentiated. This differs from our earlier findings in the dog (Eble & Rudzik, 1966b) in which the response to tyramine was blocked after combinations of amphetamine and reserpine.

The pressor response to tyramine was potentiated by the acute administration of reserpine (2 mg/kg, i.v.) in the rabbit. But if the reserpine was given before a dose of amphetamine there was a diminution of the pressor response to tyramine. Hence in the rabbit, the sequence of amphetamine-reserpine appears to determine the influence of the combination on the pressor response to tyramine. We have previously found (Eble & Rudzik, 1966b) that both sequences effectively antagonise the pressor response to tyramine in the dog.

In the cat, as in the dog, rabbit and rat, the acute administration of amphetamine or reserpine potentiated the pressor response to tyramine (Table 2). The

TABLE 2. EFFECT OF (+)-AMPHETAMINE AND RESERPINE ON THE PRESSOR RESPONSE TO TYRAMINE IN THE CAT

Treatment	No. of Determinations	Mean b.p. response to tyramine in mm Hg	P value
Control	8	38 ± 4·4*	
After amphetamine (250 μg/kg, i.v.)		54 ± 5·9	< 0·002
After amphetamine (250 μg/kg, i.v.) + reserpine (1 mg/kg, i.v.)		19 ± 4·1	< 0·001
Control	5	46 ± 6·2*	
After reserpine (1 mg/kg, i.v.)		70 ± 9·2	< 0·01
After reserpine (1 mg/kg, i.v.) + amphetamine (250 μg/kg, i.v.)		28 ± 5·2	< 0·02

* The control dose of tyramine was 50–100 μg/kg, i.v.

combination of amphetamine and reserpine in both sequences, antagonised the pressor response to tyramine.

It seems that both amphetamine and reserpine can potentiate the pressor response to tyramine and that combinations of the two agents block this pressor response. The sequence of administration of amphetamine and reserpine appears to be important for this blockade in the rabbit but not in the dog, cat and rat. The failure of amphetamine to potentiate the response to tyramine in the rabbit may be related to the relative insensitivity of the rabbit to tyramine.

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