



Amphetamine-induced anxiety-related behavior in animal models

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Abstract:

The purpose of this study was to examine the anxiety-related effects of acute and repeated amphetamine administration using the elevated plus maze (EPM) and light/dark box tests in mice. D-amphetamine (2 mg/kg *ip*, 30 min after injection) had a significant anxiogenic effect only in the EPM test, as shown by specific decreases in the percentage of time spent in the open arms as well as in the percentage of open arm entries. Tolerance to this anxiogenic action developed after 8 days of daily d-amphetamine administration (2 mg/kg, *ip*). An anxiolytic effect was observed after the ninth injection, i.e. there were specific increases in the percentage of time spent in the open arms and in the percentage of open arm entries. L-type voltage-dependent calcium channel antagonists: nimodipine (5, 10 and 20 mg/kg, *ip*), flunarizine (5, 10 and 20 mg/kg, *ip*), verapamil (5, 10 and 20 mg/kg, *ip*), and diltiazem (5, 10 and 20 mg/kg, *ip*) were also injected prior to an acute low dose of d-amphetamine or to each injection of subchronic d-amphetamine. Our results revealed that calcium channel blockers dose-dependently attenuated both an anxiogenic effect of d-amphetamine and the development of tolerance to this effect. Our results suggest that neural calcium-dependent mechanisms are involved in the anxiety-related responses to acute and subchronic amphetamine injection that may lead to addiction relapse in human users.

Key words:

d-amphetamine, anxiety, calcium channel antagonists, elevated plus maze, light/dark box, mice
