ACUTE DONEPEZIL TREATMENT ALLEVIATES THE SCOPOLAMINE-INDUCED MEMORY DEFICITS IN CONTEXTUAL FEAR CONDITIONING AND SOCIAL TRANSMISSION OF FOOD PREFERENCE IN MICE


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Introduction: Brain cholinergic system is implicated in cognitive processes and is severely damaged in Alzheimer’s disease. Scopolamine, a muscarinic receptor antagonist, impairs learning and memory both in rodents and humans.

Aims: We examined the effects of acute donepezil treatment on scopolamine-induced memory deficits in mice using contextual fear conditioning (CFC) and social transmission of food preference (STFP).

Methods: Scopolamine (1.5 mg/kg) or vehicle was administered 30 min prior to first day of CFC and prior to the interaction phase of STFP. Immediately after scopolamine, mice received vehicle or donepezil (1 or 3 mg/kg).

- **CFC**: The mice were placed in the test chamber and received two foot shocks coincided with cue tone. After 20 h, each mouse was placed in the same chamber and freezing was measured. Each mouse was placed in novel chamber 1 h later and freezing was measured without and with the cue tone.
- **STFP**: The mice were introduced by a mouse that had eaten food scented with cinnamon or cocoa. After 24 h, mice were put in cages including two cups of food, one scented with cinnamon and one with cocoa.

Results: Scopolamine-treated mice showed decreased freezing in CFC and donepezil (1 mg/kg) reversed this deficit. In STFP, scopolamine-treated mice showed no preference, whereas vehicle and donepezil (1 mg/kg) -treated groups showed significant preference for target food.

Conclusions: Scopolamine-induced deficits in hippocampal memory tasks can be reversed by donepezil. This mouse model of cholinergic dysfunction offers a rapid tool to examine cholinergic or memory-enhancing compounds.