Abstract

Spatial navigation is essential for survival not only in mammals. Neural and neuropharmacological changes of learning and memory in humans and rats could be measured through their behavior and responses to stimuli. In focus of experimental models of cognitive deficits, the Morris water maze (MWM) represents a clasiccal test of exact allothetic representation, i.e. the cognitive map. Another important test of spatial navigation is the active place avoidance, or Carousel maze (also AAPA, Active Allothetic Place Avoidance), that can be used to test the ability of cognitive coordination, thus the ability to distinguish relevant stimuli from irrelevant. There are analogous tasks for testing cognitive abilities in humans for both tests (e.g. Blue Velvet Arena for MWM, virtual reality simulations on PC for AAPA, etc.). Aim of the present study is to compare the sensitivity of outbred Long-Evans and Wistar strains of rats from the institutional breeding to the acute administration of scopolamine, the antagonist of central muscarinic acetylcholine receptors, at doses 0.8 mg/kg; 1.5 mg/kg and 3.0 mg/kg. The results show that the Wistar strain is more influenced by cholinergic blockade than Long-Evans strain in both AAPA and the MWM. Furthermore, it appears that the control rat strain Long-Evans have better performance in test AAPA and better resolves task the visible platform in the MWM than control Wistar suggesting better vision pigmented rats. This study suggests that Wistar rats might be preferentially considered for future testing in anticholinergic models of preclinical drug research, behavioral and cognitive deficits after cholinergic blockade in spatial tasks, due to their higher sensitivity to scopolamine. This study might also have general impact on research of cognitive decline such as in Alzheimer's disease.

Keywords

behavioral pharmacology; inter-strain differences; scopolamine; spatial navigation; learning