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EFFECTS OF SCOPOLAMINE ON SOCIAL TRANSMISSION OF FOOD PREFERENCES

EFECTOS DE LA ESCOPOLAMINA EN LA TRANSMISIÓN DE PREFERENCIAS ALIMENTARIAS

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Abstract

Rats must forage adaptively, choose safe foods, and avoid poisonous foods. The social transmission of food preference paradigm is useful to study learning and memory. Several studies have found that the associations formed in that paradigms are examples of declarative memory. Scopolamine induces interference in learning and consolidation of memories in diverse tasks. In this experiment, we evaluated the effect of one dose of the drug on the memory formed in several trials of this paradigm. In three groups, we evaluated the effect of administering saline and scopolamine with a control group that received no treatment. Results showed that the dose of scopolamine interfered with the consolidation of a series of trials in the transmission of preference. We discussed the effect in relation to different studies that used different tasks. The results support that scopolamine impaired consolidation on social transmission of food preference.
Key words: Social transmission of food preference, learning, memory consolidation, scopolamine.

Resumen

Las ratas deben alimentarse de forma adaptativa, elegir comidas seguras y evitar comidas venenosas. El paradigma de transmisión social de preferencias alimenticias es útil para estudiar el aprendizaje y la memoria. Algunos estudios han encontrado que las asociaciones que se forman en ese paradigma son ejemplos de memoria declarativa. La escopolamina produce interferencia en el aprendizaje y en la consolidación de las memorias en diferentes tareas. En este experimento evaluamos el efecto de una dosis de la droga sobre la memoria formada en varios ensayos en este paradigma. En tres grupos evaluamos el efecto de administrar salina o escopolamina con un grupo control que no recibió tratamiento. Los resultados mostraron que la dosis de escopolamina interfirió con la consolidación de una serie de ensayos en la transmisión de preferencia. Discutimos el efecto en relación a diferentes estudios que utilizaron diversas tareas. Los resultados apoyan que la escopolamina deterioró la consolidación de la transmisión social de preferencia.
Palabras clave: Transmisión social de preferencia alimenticia, aprendizaje, consolidación de la memoria, escopolamina.

Introduction

Rats are omnivore animals and forage in a great variety of habitats (Collier, Hirsch & Kanarek, 1977). Galef and Whiskin (1997) mentioned that animals do not have language and depend on conspecific observation to obtain information from them. One behavior vital for rats is to forage in adaptive ways. They must choose safe foods and avoid poisonous foods.

Sources of information that rats use are olfactory cues, olfactory stimuli (Arriaga et al, 2006; Rodas, 1974). Rats use olfaction to identify sources of food present in leaders' breath returning from a foraging trip. Galef and Wigmore (1983) and Posadas-Andrews and Roper (1983) found in the same year and published in the same journal number, a finding that showed that rats, specifically Long Evans rats, were guided in adaptive foraging by olfactory cues present in demonstrator rats. A great number of studies found that this phenomenon is reliable (Galef, 1996; Galef & Whiskin, 2003) and that the essential ingredient of this social transmission of information was carbon disulfide, an element present in rats' breath and the flavor of food eaten by demonstrators (Galef, Mason, Preti, & Bean, 1988). Galef and Durlach (1993) found absence of blocking (Kamin, 1969) in another study that evaluated the conditioned stimulus properties of the flavor of food that demonstrators had eaten. This absence of blocking demonstrated that rats are able to process at least two social stimuli in sequence, without the first interfering with the second.

Juárez-Maldonado et al. (2006) and Melchor-Hipólito et al. (2010) found serial position effects with a list of three demonstrators, with a technique that used this social learning model developed by Galef and Wigmore (1983) and Posadas-Andrews and Roper (1983).

Eichenbaum (2002) studying the involvement of the hippocampus in associative learning used this social transmission of food preference paradigm as an example of social olfactory learning and memory (Bunsey & Eichenbaum, 1995). He mentioned that this aspect of the social transmission of food preference task, the expression of memory in a situation different from the learning trial, is strongly consistent with the declarative property of representational flexibility.

The cholinergic system is essential in learning and memory. A muscarinic cholinergic antagonist like scopolamine may modify learning and memory in different tasks (Bammer, 1982; Blozovski & Hennocq, 1982; Brito, Davis, Stopp, & Stanton, 1983; Caine, Weingartner, Ludlow, Cudahy, & Wehry, 1981; Carnicella, Pain & Oberling, 2005; Decker, Tran, & McGaugh, 1990; Ennaceur & Meliani, 1992; Izquierdo, 1989; Mendez, Gilbert, Bizon, & Setlow, 2012; Petersen, 1977; Savage, Faust, Lambert, & Moerschbaecher, 1996). Several studies showed