Estradiol Modulates the Fear Memory Reconsolidation Impairing Effect of Δ^9-tetrahydrocannabinol

Poster

Comportamiento/Cognitivo - Behavioral/Cognitive

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Introduction

Fear memory retrieval triggers reconsolidation, which offers a potential therapeutic window to attenuate aversive memories. Our previous results showed that proestrus females are resistant to the effects of Δ^9-tetrahydrocannanbinol (THC) on fear memory reconsolidation, suggesting an interplay between the endocannabinoid system and ovarian hormones. Here, we investigated whether estradiol changes the THC effects on fear memory reconsolidation in male and female rats.

Methods

Ovariectomized (OVX) females and adult male Wistar rats were fear conditioned to Context A and underwent a short retrieval session (3 min) to induce reconsolidation. Males received estradiol (1 µg/kg, s.c.) 6 hours before retrieval. Immediately after, rats were treated with THC (0.002 mg/kg, i.p.). Freezing behavior was quantified to assess fear memory retention. Fear generalization was investigated during exposure to a novel context. Two-way ANOVA followed by Newman-Keuls posthoc test was used. The protocols were approved by local ethical committee.

Results

OVX-rats treated with THC presented a significant reduction of freezing behavior when

compared to control (n=8-10/group), suggesting the absence of ovarian hormones renders memory sensitive to the THC effect. In males, the treatment with THC presented a similar effect as OVX-females (n=8-10/group). Conversely, the pretreatment with estradiol abolished the THC effect. No significant effects on fear generalization were observed.

Conclusion

Our results suggest that high estradiol levels abolishes the THC effect on reconsolidation, whereas low estradiol levels renders memory sensitive to THC. These findings suggest a relationship between estradiol and cannabinoid signaling underlying the modulation of fear memory reconsolidation.

Financiamiento:

National Council for Scientific and Technological Development- CNPQ; Araucaria Foundation