

Interactive effects of a protein kinase A inhibitor and testosterone on spatial learning in the Morris water maze.

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Source

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Abstract

Neurohormones such as testosterone (TE) are important in modulation of learning and memory. In the present study, we investigated the interactive effects of pre-training bilateral intra-hippocampal infusions of testosterone and H-197, a selective PKA inhibitor, on spatial acquisition in the Morris water maze (MWM). Different doses of TE (1, 5 and 10 µg/side) and H-197 (1 and 10 µM/side) were administered 15 min before start of the training each day. Control animals received bilateral intra-hippocampal infusions of DMSO as vehicle for TE and H-197. Animals were trained for 5 days and each day included one block of four trials. The results of this study showed that bilateral infusion of TE (5 and 10 µg/side) or H-197 (10 µM/side) impaired spatial learning as indicated by significant increases in escape latency and traveled distance compared to the control group. Although pre-training bilateral infusions of a low concentration of either TE (1 µg/side) or H-197 (1 µM/side) into the CA1 region of the hippocampus did not affect learning capabilities, but the combination of the low doses of the drugs led to significant deficits in spatial acquisition. Overall, our data suggest that spatial acquisition was affected by PKA inhibition or TE administration. Moreover, when co-administered, these drugs had a negative synergistic impact on acquisition.