Agmatine Improves Spatial Memory Consolidation: The Role of Nitric Oxide

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Abstract

Objective: The existence of agmatine in the hippocampus suggests a role in memory formation. Endogenous agmatine increases after training in the hippocampus, howbeit the effect of exogenous agmatine on memory is not consistent yet. This work was aimed to assess the differential effect of systemic agmatine on spatial memory consolidation and retrieval. Additionally L-NAME was used to assess if nitric oxide is involved in the effect of agmatine.

Methods: Male Sprague-Dawley rats (250-350 g) were trained in water maze single training session. After 24 h the memory of animals were examined in a probe trial which was consisted of a trial without platform. To assess the effect of agmatine (40 mg/kg) on memory consolidation it was administered immediately after training and to assess its effect on memory retrieval it was injected 30 min before probe trial. In order to evaluate the involvement of nitric oxide, L-NAME (3 mg/kg) was co-administered with agmatine.

Results: Post-training injection (to assess consolidation phase) of agmatine improved the performance of animals in probe test, while its pre-probe administration (to assess retrieval phase) had no effect. L-NAME prevented the improving effect of agmatine on consolidation phase of memory. Conclusion: Agmatine improves spatial memory consolidation while has no effect on memory retrieval. Nitric oxide is involved in the effect of agmatine.

Keywords: Agmatine; Nitric oxide; Spatial memory; Rat; Morris water maze

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