

Poster presentation

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Potential of acetylcholine action in the ventral tegmental area facilitates morphine-state dependent learning

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Background

It is well known that morphine influence learning and memory processes. the ventral tegmental area (VTA) which has an important role in reward, participates in morphine-induced impairment of memory retention [1]. Considering the cholinergic system is involved in the effects of morphine on memory [2], in the present study, the effects of intra-VTA injections of an anticholinesterase, physostigmine on morphine-state dependent learning has been investigated in rats.

Materials and methods

A single-trial step-through passive avoidance task was used for the assessment of memory retention in male Wistar rats. Animals were bilaterally cannulated in the ventral tegmental area by stereotaxic instrument, and were allowed to recover 1-week before behavioral testing.

Results

Post-training subcutaneous (s.c.) administration of different doses of morphine dose dependently decreased the learning and induced amnesia. The administration of the same dose of morphine as pre-test treatment induced state-dependent learning. Pre-test intra-VTA injection of physostigmine with an ineffective dose of morphine significantly restored the retrieval and potentiated morphine state-dependent memory. Moreover, Pre-test intra-VTA administration of the physostigmine alone did not affect memory retention.

Conclusions

This findings indicate that the potentiation of cholinergic system in the VTA by physostigmine facilitates morphine state-dependent learning.

References

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