

عنوان مقاله:

The effects of crocin on spatial memory impairment induced by hyoscine: Role of NMDA, AMPA, ERK, and CaMKII proteins in rat hippocampus

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خلاصه مقاله:

Objective(s): Crocus sativus L. and its active constituent, crocin, have neuroprotective effects. The effects of crocin on memory impairment have been mentioned in studies but the signaling pathways have not been evaluated. Therefore, the aim of this study was to evaluate the effects of crocin on the hyoscine-induced memory impairment in rat. Additionally, the level of NMDA (N-methyl-D-aspartate receptors), AMPA (α -amino-3-hydroxy-5-methyl-4-isoxazole-propionic acid), ERK (extracellular signal-regulated kinases), CaMKII (calcium (Ca^{2+})/calmodulin (CaM)-dependent kinase II) mRNA and proteins were determined in rat hippocampus. **Materials and Methods:** Crocin (10, 20, and 40 mg/kg), hyoscine (1.5 mg/kg), normal saline and rivastigmine were administered intraperitoneally to male Wistar rats for 5 days. The effects on memory improvement were studied using Morris water maze (MWM) test. Then, the protein levels of NMDA, AMPA, ERK, pERK, CaMKII and pCaMKII in hippocampus were analyzed using the Western blot test. Furthermore, the mRNA levels of NMDA, AMPA, ERK and pCaMKII genes were evaluated using real-time quantitative reverse transcription-polymerase chain reaction (qRT-PCR) method. **Results:** Administration of crocin (20 mg/kg) and rivastigmine significantly improved learning and memory impairment induced by hyoscine. Also, administration of hyoscine reduced protein level of pERK, while treatment with crocin (20 mg/kg) recovered the protein level. No changes were observed in the protein levels and mRNA gene expression of NMDA, AMPA, ERK, CaMKII and pCaMKII following administration of hyoscine or crocin. **Conclusion:** Administration of crocin improved memory and learning. The effect of crocin in this model can be mediated by alteration in pERK protein level in rat hippocampus.

کلمات کلیدی:

Crocin, Saffron, Memory, Erk, CaMKII, NMDA, AMPA

