

The Effects of captopril on spatial memory and synaptic plasticity impairment induced by lipopolysaccharide in rats

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Abstract

Introduction: Renin-angiotensin system has a role in inflammation and also involves in many brain functions such as learning, memory and emotion. Neuro-immune factors have been proposed as the contributors to the pathogenesis of memory impairments. In the present study, the effect of captopril on spatial memory and synaptic plasticity impairment induced by lipopolysaccharide (LPS) was investigated in rats.

Methods: The rats were divided into three groups and treated: Control (saline), LPS (1 mg/kg), LPS- captopril (LPS-capto; 50 mg/ kg captopril before LPS). Morris water maze was done. Long-term potentiation (LTP) from CA1 area of hippocampus was assessed by 100 Hz stimulation in the ipsilateral Schafer collateral pathway.

Results: In LPS group, the spent time and traveled path to reach platform were longer than control while, in LPS- capto group they were shorter than LPS group. The slope and amplitude of field excitatory post-synaptic potential (fEPSP) in the LPS group were decreased compared to control whereas, in LPS- capto group they were increased compared to LPS group.

Conclusion: The results of present study showed that captopril improved the LPS- induced memory and LTP impairments induced by LPS in rats. Moreover, further investigations are required in order to better understanding the responsible mechanism(s).

Key words: Rat, Lipopolysaccharide, Captopril, Spatial memory, Long term potentiation