

THE EFFECT OF MK-801 ON THE ERK-CREB SIGNAL SYSTEM IN PRENATALLY STRESSED OFFSPRING RATS

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Introduction: Studies revealed that prenatal stress (PS) may increase the vulnerability to depression in their offspring, and ERK-CREB signal system might play a role in its mechanism.

Objectives and aims: The present study investigated the effect of MK-801 on depressive-like behavior and its impacts on ERK2, CREB, Bcl-2 mRNA expression in PS female rat offspring.

Methods: The pregnant rats were randomly divided into three groups, the control group (Con) was left undisturbed, the PS-saline group (PS-saline) and the PS-MK-801 group (PS-MK-801) were subjected to restraint stress on days 14-20 of pregnancy three times daily for 45 min, and received an i.p. administration of saline or MK-801 (sigma, 0.2mg/kg) 30 min before the first stress respectively. Forced swimming test was undertaken to assess depressive-like behavior in one month female offspring. ERK2, CREB, Bcl-2 mRNA in the hippocampus, frontal cortex, and striatum were detected by RT-PCR.

Results: PS-saline spent significantly more immobile time compared to Con and PS-MK-801 ($P < 0.05$). ERK2 and CREB mRNA expression in hippocampus and frontal cortex was significantly decreased in PS-saline compared to Con and PS-MK-801 ($P < 0.05$), while in striatum CREB mRNA expression in PS-saline was lower than Con ($P < 0.05$). Bcl-2 mRNA expression in hippocampus and striatum was significantly decreased in PS-saline ($P < 0.05$), and in frontal cortex, its expression was significantly lower in PS-saline and PS-MK-801 ($P < 0.05$).

Conclusions: PS may suppress ERK-CREB signal pathway in female offspring rats, which could be partly prevented by MK-801. (Supported by National Natural Science Foundation of China, No: 30970952).