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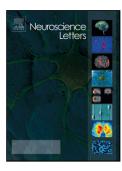
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Involvement of Akt/GSK3β/CREB signaling pathway on chronic omethoate

induced depressive-like behavior and improvement effects of combined lithium

chloride and astaxanthin treatment

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Abstract

Chronic organ ophosphorus pesticides (OP) exposure is associated with an increased

risk of depression, and there is an urgent need to find an effective treatment for the

depressive-like symptoms caused by OP. The main purpose of this study was to

investigate whether combined lithium chloride (LiCl) and astaxanthin (AST)

treatment would manifest synergetic antidepressant effects on mice with chronic OP

exposure, and to determine the role of the Akt/GSK3β/CREB signaling pathway. Our

results showed that chronic omethoate exposure significantly increased immobility

time in behavioral tests and induced neuron damage in HE staining. The expression of

p-GSK3β, p-CREB, p-PI3K and p-Akt in hippocampus after OP exposure were

significantly down-regulated, while the influences were reversed by LiCl and AST

treatment. Moreover, the combined application of AST and LiCl had synergistic

therapeutic effects compared to LiCl and AST treatment alone, the expression of

p-GSK3B, p-CREB, p-PI3K and p-Akt after combined LiCl-AST treatment were

significantly higher than that with single drug application. These results showed that

the combination of LiCl and AST could efficiently ameliorate depressive-like

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