

Antidepressant Activities of n-3 Polyunsaturated Fatty Acids in Acute Stress-Induced Depression Animal Model

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급성 스트레스로 유발한 우울증 동물 모델에서 오메가-3 지방산의 항우울증 효과

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Objectives Depression is one of the most common disease, but the pathophysiologic mechanism of depression remains elusive. The study was conducted to evaluate the behavioral effect and clarify the mechanism of antidepressant action on n-3 polyunsaturated fatty acids in acute stress-induced depression male Sprague-dawley rats.

Materials and Methods Eleven-week-old male Sprague-Dawley rats (n=24) were fed an American Institute of Nutrition-93M diet containing 0% (n=8), 0.5% (n=8), or 1% (n=8) of EPA and DHA as total kg of diet for 12 weeks. After 12 weeks, all rats were subjected to a 15-min pretest followed 24 h later by a 5-min Forced Swimming test (FST). Behavioral responses were observed and recorded during the 5-min test. The fatty acid composition from the brain tissue and the red blood cell were analyzed by gas chromatography. The total amounts of c-AMP response element binding protein (CREB), phosphorylated CREB (pCREB) and tumor necrosis factor alpha (TNF-α) protein from hippocampus of the rats were assessed by western blot analysis. The plasma serotonin levels were measured by ELISA.

Results Total dietary intake, body weight, and organ weight were not significantly different among groups. The immobility and climbing behavior were significantly affected in 0.5% and 1% EPA+DHA group compared with 0% group (p < 0.05). Plasma serotonin level and total CREB expression were significantly higher in 0.5% group than 0% and 1% group. In conclusion, our result shows that n-3 polyunsaturated fatty acids (EPA=DHA) may have a beneficial effect on preventing the development of depression in rats.

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