

Marine Nutraceuticals improve Mental Health: Evidences from Fish Oil and Taurine

Shih-Yi Huang, Ph.D. 黃士懿

Chair and Professor

School of Nutrition and Health Sciences

Taipei Medical University, Taipei, TAIWAN

Mental health diseases have been considered to be major diseases in the 21st century, especially in the major depressive disorder (MDD) and alcoholic disorder. Based upon the evidence from epidemiological data, biological studies in patients, and recent clinical trials, omega-3 polyunsaturated fatty acids (PUFAs) seem to be involved in the mechanisms underlying the pathogenesis and treatment of depression. Eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), the major bioactive components of n-3 PUFAs, are not synthesized in human body and can only be obtained directly from the diet, particularly by consuming fish. The abnormalities in PUFA composition in cell membranes can alter membrane microstructure, which could result in abnormal signal transduction and immunological dysregulation, and possibly can increase the risk of developing depression. In past few years, we focused on the fish oil alimentation on the mental disorders, especially in the major depressive disorder. In our double-blind placebo-controlled clinical trials^(1,2), we administrated 6.6 gm and 3.4 gm fish oil per day for MDD patients and MDD pregnancy women for 8 weeks, respectively. The results showed the fish oil may have therapeutic benefits in depression patients and even during pregnancy. The omega-3 PUFAs were found well tolerated and there were not adverse effects on the subjects and newborns. Besides, we also conducted a potential marine active component "taurine" on the regulation of sulfur-containing amino acids (SCAAs) under chronic alcohol consumption. As an end product of SCAA metabolism, taurine plays a crucial role in brain neurotransmission. Taurine and its analogues are new believed to be correlated with many psychological disorders, such as major depression, epilepsy, anxiety, and alcoholism. We concluded that subchronic high levels of ethanol consumption interrupted transmethylation and transsulfurations, thus imbalancing SCAA metabolism. An extra supplementation of taurine could possibly replenish the damage caused by alcoholism^(3,4). However, further study is needed to clarify the actual mechanisms and actions of taurine to evaluate the possible utilization for alcoholic abstinence.

References:

1. Su KP*, Huang SY*, Chiu CC and Shen WW (2003) Omega-3 fatty acids in major depressive disorder A preliminary double-blind, placebo-controlled trial. *Euro Neuropsychophama* 13: 267-271.
2. Su KP*, Huang SY*, Chiu TH, Huang CL, Chang HC, Pariante CM (2008) Omega-3 fatty acids on major depressive disorder during pregnancy. *J Clin Psychia* (in press)
3. Yang HT, Chen YH, Chiu WC, Huang SY* (2006) Effects of consecutive high-dose alcohol administration on the utilization of sulfur-containing amino acids by rats. *J Nutr Biochem* 17: 45-50.
4. Yang HT, Chien YW, Tsen JH, Chang CC, Chang JH, Huang SY* (2008) Taurine supplementation improves the utilization of sulfur-containing amino acids in rats continually administrated alcohol. *J Nutr Biochem* (in press)