Effects of polyunsaturated fatty acids on psychiatric disorders

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Abstract

Dear Sir:

We are pleased to see the increased recognition of polyunsaturated fatty acids (PUFAs) in health promotion and medical treatment. However, a recent article in the Journal (1) covered many aspects of PUFAs but excluded many recent findings on psychiatric disorders, possibly because of the lag between the symposium and publication of the article. Empirical studies related to psychiatric disorders have focused on 1) assessment of PUFAs in the tissues (red blood cell membrane, platelet, fibroblast, and postmortem brain) of psychiatric patients, 2) therapeutic trials of PUFAs for the treatment of psychiatric disorders, and 3) evidence from the data of epidemiologic surveys.

Studies in primates suggested that the PUFA concentrations of the red blood cell membrane can reflect the PUFA composition of frontal cortex (2). PUFAs are found to be depleted in the red blood cell membrane of patients with schizophrenia (3) and major depressive disorder (4). Horrobin et al (5) found decreased PUFAs in the frontal but not in the cerebellar cortex of postmortem brain tissue from schizophrenic patients. Tissue PUFA deficiency has provided the rationale for treating symptoms of psychiatric disorders with n-3 fatty acids. The results of one open trial suggested that eicosapentaenoic acid might improve residual symptoms in schizophrenic patients (6). Furthermore, n-3 fatty acids exhibited mood-stabilizing properties in bipolar disorder in a recent pilot study (7). Thus, n-3 fatty acids may play an important role in the psychoneuroendocrinology of various psychiatric disorders.

From the epidemiologic data, societies consuming large amounts of fish, which contains more n-3 fatty acids than do other foods, appear to have a lower rate of major depression (8). Pekkanen et al (9) found that lower serum cholesterol was associated with a lower mortality rate from accidents and violence in coastal Western Finland. However, no association was found in Eastern Finland, which is

located inland. Thus, the consumption of fish may be protective against psychiatric illnesses. These findings imply that PUFA concentrations might explain the controversial results concerning cholesterol and psychiatric disorders (10).

More than 65% of the dry weight of the brain is composed of lipids that play important structural and functional roles. Abnormalities in the PUFA composition of the brain can alter membrane microstructure and consequently affect brain function. We are not sure whether abnormality of PUFAs is of primary etiologic significance, secondary to the development of psychiatric disorders, or the result of other factors, such as diet, smoking, or treatment of psychiatric illness. More systemic studies involving PUFA analysis and supplementation in patients with psychiatric illnesses, controlling for confounding factors, are needed to resolve these issues.