



ESSENTIAL FATTY ACIDS IN THE BRAIN

Depression and other mood disorders, are undoubtedly some of the most commonly experienced conditions around the world, resulting in a massive economic burden upon immediate family members and caregivers, work productivity, mortality and the health care system to name but a few. The World Health Organization estimates that by the year 2020, depression will become the second leading cause of disability worldwide, second only to ischemic heart disease. [1]

INCIDENCE INCREASE DUE TO MODERN DIETARY HABITS

A skewed ratio of essential fatty acids has long been proclaimed to be the causative link to the increased incidence of major depression in the modern age. It has been postulated that countries with higher consumption of omega-3 fatty acid rich diet, where fish is a major component, have a significantly lower rate of depression. [2] The increased use of soy, corn, palm and cottonseed oils in the last 100 years has completely altered the traditional ratio of omega-6 to omega-3 fatty acids in the diet. The ideal ratio of omega-6 to omega-3 has been recommended by an international panel of experts to be approximately 2:1. [3] Current diet trends of the Western World, estimate that the present ratio is closer to 20:1. [4]

EFAs: MAJOR BUILDING BLOCKS TO MENTAL HEALTH AND BRAIN CHEMISTRY?

Though many advances in psychotherapeutics and pharmacological treatments have been made, compliance and measurable efficacy has been limited. For example, the use of serotonin selective reuptake inhibitors (SSRIs) are the most commonly prescribed type of drug for the treatment of depression. However it must be noted, that the reported improvement in symptoms by 50% are seen in only half of the patients who take them and by less than 60% in those who complete the course of treatment. Furthermore, as indicated in clinical trials, a reported 30% of depressed individuals cease SSRI treatment due to problematic side effects, limited efficacy or both. [5]

Given that approximately 20% of the dry weight of the brain is composed of polyunsaturated fatty acids (PUFAs) and that one out of every three fatty acids in the central nervous system are PUFAs, the importance of these fats can not be disputed. [6] Given the high concentration of essential fatty acids in the nervous system, it is unsurprising that researchers have found a link between the dietary consumption of omega-3 fatty acids and brain function. [4]

While the pathophysiology of depression has not been totally elucidated, there is a growing amount of evidence suggesting the involvement of the frontal cortex and limbic system, including the hippocampus and nucleus accumbens. [7] A large body of research suggests altered neurotransmission,

involvement of cytokines, poor glucose utilization by the brain and insufficient vascular circulation within the brain as all being potential contributory factors of major depression. [4]

LACK OF OMEGA-3 AS ONE POTENTIAL CAUSE OF DEPRESSION

Omega-3 fatty acids are an essential component of the central nervous system membrane phospholipids acyl chains and are therefore critical to the dynamic structure and function of neuronal cell membranes. Proteins are embedded in the lipid bi-layer of the cell, and their structure is highly sensitive to lipid components. These proteins facilitate an important function in cellular communication as they act as transporters and receptors. [8] Optimal fluidity of the membrane is influenced by essential fatty acids and is required for the neurotransmitter binding and signaling within the cell. [4] A lack of these essential fatty acids may impair cellular communication which could consequently result in mood disorders.

The second area where omega-3 fatty acids may exert their influence over major depression is via cytokine modulation. Recent studies indicate that elevations in the proinflammatory immune chemicals, particularly interleukin-1 beta, -2 and -6, interferon gamma and tumour necrosis factor alpha can all impact the central nervous system and are associated with the severity of depression. Psychological stress can result in elevations of these cytokines which can in turn result in lowered neurotransmitter precursor availability, activation of the hypothalamic-pituitary axis and alterations in neurotransmitter metabolism. [9]

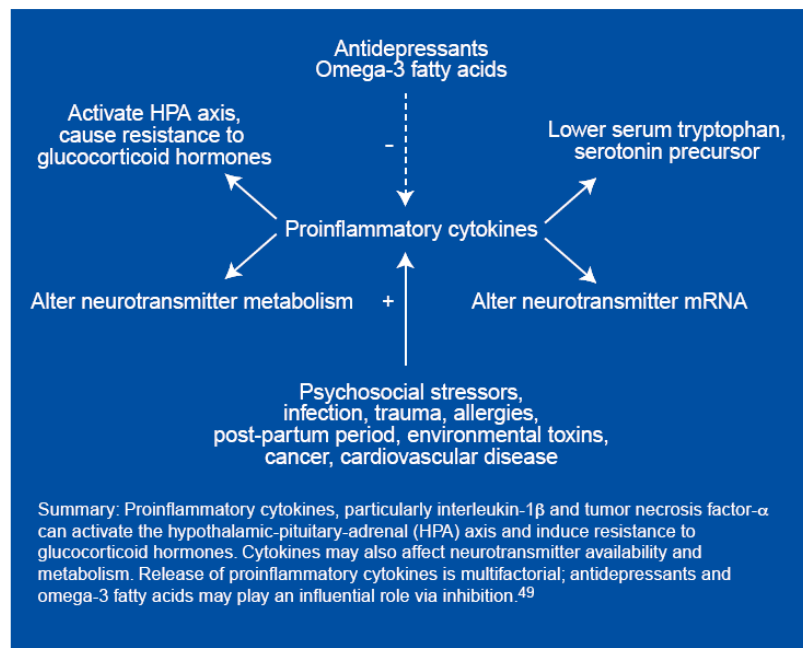


Figure 1: Potential mechanisms of action of inflammatory cytokines in depression [9]

JUST ADDING FISH TO THE DIET IS NOT ALWAYS A VIABLE OPTION

Many studies have targeted increasing omega-3 rich foods in the diet or fortification of foods with omega-3 fatty acids to determine how this impacts mental health. However, this is not always a practical option for many individuals, who then resort to supplementation with fish oil products as the

alternative. Compliance and quality of the oils are two integral factors in achieving therapeutic effects of fish oils. With the market currently being flooded with numerous fish oil supplements, it can be difficult to prescribe and recommend fish oils to your patient with confidence in the quality of the product.

Arguably, freshness is one of the most important aspects of fish oils as this ensures product integrity and biological efficacy. The patented, oxygen-free manufacturing process of Nordic Naturals, provides extremely low peroxide levels (an indication of freshness) found to be fourteen times lower than Norwegian Medicinal Standard (NPS) and European Pharmacopoeia Standard (EPS) limits. The ‘freshness factor’ is crucial for several reasons, not only to ensure compliance by eliminating a fishy taste or fishy repeat but also a low peroxide value prevents free radical formation.

Purity is another reason why Nordic Naturals offer a superior range of fish oil products. The fish are sourced from some of the cleanest waters in the world, with independent testing conducted for not only heavy metals but also over 210 other environmental contaminants. Nordic Naturals is tested to 10ppb for heavy metals and 0.2ppt for dioxins and PCBs without detection – possibly the lowest level in the world for any fish oil.

You can have faith as a health practitioner, that you are providing an excellent service to your patient when prescribing Nordic Natural fish oils. They will not only love the taste and absence of a fishy repeat but also appreciate the extraordinary results when using the Nordic Naturals brand.

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