

Fish Oils and Mental Health/Depression/Dementia

Summaries of the latest research concerning fish oils and mental health, depression and dementia

Fish oil protects against Alzheimer's disease

CHICAGO, ILLINOIS. High levels of the omega-3 fatty acid docosahexaenoic acid (DHA) are found in the more active areas of the brain including the cerebral cortex, mitochondria, synaptosomes, and synaptic vesicles. At least one epidemiologic study has shown that patients with Alzheimer's disease (AD) have significantly lower levels of omega-3 fatty acids in their plasma phospholipids than do age- matched controls. Researchers at the Rush-Presbyterian-St. Luke's Medical Center now report that older people can reduce their risk of developing AD by increasing their intake of fish and fish oil (DHA). Their study included 815 men and women over the age of 65 years who had showed no sign of AD during a thorough baseline examination. About 2 years after the examination all participants completed a 154- item food frequency questionnaire and provided information about their current use of supplements. After another 2 years all participants were again subjected to a thorough, structured neurologic clinical evaluation to establish the presence or absence of AD. A total of 131 study participants were found to have developed AD over the 3.9-year follow-up period. The researchers found that participants who consumed fish just once a week had a 60% lower risk of developing AD than did those who rarely or never ate fish. They also observed that participants whose daily intake of DHA was about 100 mg/day had an incidence of AD which was 70% lower than those with an intake of 30 mg/day or less. Eicosapentaenoic acid (EPA), another component of fish oil, showed no appreciable effect; however, the maximum intake was only 30 mg/day. A high total intake of omega-3 fatty acids was also strongly correlated with a reduced risk for AD. Participants with an intake of 1.6 ? 4.1 grams/day had a 70% lower risk than those with an intake below 1.05 grams/day. Alpha-linolenic acid (flaxseed oil) intake was not associated with AD risk except in the case of people with the APOE-epsilon 4 allele where a high intake was strongly protective. The researchers conclude that an increased intake of fish or omega-3 fatty acids, especially DHA, can substantially reduce the risk of developing Alzheimer's disease. *Morris, MC, et al. Consumption of fish and n-3 fatty acids and risk of incident of Alzheimer's disease. Archives of Neurology, Vol. 60, July 2003, pp. 940-46* *Friedland, RP. Fish consumption and the risk of Alzheimer disease. Archives of Neurology, Vol. 60, July 2003, pp. 940-46/ *Editor's comment:* High doses of fish oils should always be accompanied by vitamins E and C in order to prevent oxidation of the oil.*

Cognitive function and fat intake

PARIS, FRANCE. Several epidemiological studies have shown that a high dietary intake of linoleic acid and a low intake of fish oils (eicosapentaenoic acid [EPA] and docosahexaenoic acid [DHA]) are associated with cognitive impairment and an increased risk of dementia. French researchers now report that the fatty acid composition in erythrocytes (red blood cells) is an indicator of the risk of cognitive function decline (ability to learn, think and remember). Their study involved 246 men and women (aged 63 to 74 years) who had the lipid (fatty acid) composition of their erythrocytes analyzed in 1995. All participants also underwent tests to determine their cognitive function at baseline and after a 4-year follow-up period. The researchers found that study participants with high erythrocyte levels of stearic acid (a saturated fatty acid) had a 91% higher risk of having experienced a significant decline in cognitive function over the 4 years than did participants with average levels. Participants with high levels of linoleic acid (an unsaturated omega-6 acid) had a 59% increased risk of decline while those with high levels of EPA and DHA had a 41% lower risk of experiencing cognitive decline than did those with normal levels. The researchers suggest that the omega-3 fatty acids EPA and especially DHA help keep the

membranes of brain cells more fluid while saturated and omega-6 fatty acids tend to "harden" them. They believe this and the anti-inflammatory effects of EPA and DHA are what help preserve cognitive function. / Heude, Barbara, et al. Cognitive decline and fatty acid composition of erythrocyte membranes ? The EVA Study. American Journal of Clinical Nutrition, Vol. 77, April 2003, pp. 803-08/ *Editor's comment:* Stearic acid is found in high quantities in beef, mutton, and pork while omega-6 fatty acids are abundant in vegetable oils such as safflower, sunflower, and soybean oil. The long-chain omega-3 fatty acids (EPA and DHA) are found in fatty fish and fish oils.

Fish oil derivative reduces depression

SHEFFIELD, UNITED KINGDOM. There is considerable evidence that fish oils help in combating depression and other mental illnesses. What is not quite clear is whether it is eicosapentaenoic acid (EPA) or docosahexaenoic acid (DHA) that is the most active component. The standard medical therapy for depression involves the use of tricyclic antidepressants or selective serotonin reuptake inhibitors (SSRIs). These drugs, however, are not terribly effective. Prozac, for example, produces a 50% improvement in symptoms in only 38% of patients starting treatment. This is not much better than the placebo effect, which provides 50% improvement in about 25% of patients. A team of British and Scottish researchers has just completed a study aimed at determining if the ethyl ester of EPA, ethyl-eicosapentaenoate (EEP), would be effective in strengthening the beneficial effect of standard antidepressants. The study involved 60 patients who were already being treated with SSRIs or tricyclic antidepressants. Fourteen patients received a placebo while the remaining 46 received either 1, 2 or 4 grams/day of EEP. All participants were evaluated for depression using several different scales at the beginning of the experiment and after 12 weeks. At the end of the study it was clear that the 1 gram/day dosage of EEP was highly effective in reducing depression and associated conditions such as sadness, pessimism, inability to work, sleep disturbances, and diminished sex drive. In most cases, 60- 70% of patients receiving 1 gram/day of EEP showed an improvement of 50% or better. This compares to only 25% of the patients on the placebo showing a 50% improvement. The degree of improvement was substantially less in the 2 grams/day and 4 grams/day groups. The researchers speculate that this could be due to the depletion of the omega-6 fatty acid, arachidonic acid, by an excess of omega-3 fatty acid (EPA), indicating that the balance between omega-3 and omega-6 is important when it comes to depression. The researchers conclude that concurrent treatment with 1 gram/day of EEP is effective in reducing depression in patients who are still depressed despite treatment with standard medications. They are now planning on evaluating EEP on its own as a treatment for depression. *Peet, M. and Horrobin, DF. A dose-ranging study of the effects of ethyl-eicosapentaenoate in patients with ongoing depression despite apparently adequate treatment with standard drugs. Archives of General Psychiatry, Vol. 59, October 2002, pp. 913-19/*

Fish oils: A cure for depression

WASHINGTON, DC. On a worldwide basis more working days are lost to depression than to any other illness. The incidence of depression is growing with people born within the last 50 years being twice as likely to suffer from it than were their parents. Dr. Joseph Hibbeln of the National Institutes of Health believes that the reason for the increase in depression can be directly attributed to a major shift in dietary patterns, specifically fat intake. He points out that the vast increase in the use of soy, corn, palm and cottonseed oils in the last 100 years has totally changed the traditional ratio of omega-6 to omega-3 fatty acids in the diet. Soy oil consumption in the US, for example, has increased thousand-fold in the last 100 years helping to skew the omega-6 to omega-3 ratio from about 1:1 to today's 16:1. This, Dr. Hibbeln believes, spells trouble. The brain consists pretty well entirely of fat so clearly one's fat intake could affect one's brain composition, particularly the ion channels which channel signals in and out of the brain. There is also evidence that low levels of omega-3 fatty acids are associated with low levels of the mood hormone serotonin. Dr. Hibbeln's hypothesis is supported by the fact that the incidence of

depression is considerably lower in countries with a high fish consumption. Fish, particularly fatty ocean fish, is an excellent source of omega-3 fatty acids and its frequent consumption would help to nudge the ratio back towards the optimum 1:1. At least three clinical trials have observed a marked improvement in depressed patients given relatively high doses of fish oils. This has spurred other scientists to look closer at the potential benefits of fish oil supplementation. At the moment there are at least 10 clinical trials underway evaluating fish oils in the treatment of depression, attention deficit disorder, and schizophrenia. *Small, Meredith F. The happy fat. New Scientist, August 24, 2002, pp. 34-37/ *Editor's comment:* Daily supplementation with 1-3 grams of a high quality fish oil is entirely safe and may not only improve your mood, but help protect you from heart disease, stroke and arthritis as well.*

Fish consumption reduces suicide risk

KUOPIO, FINLAND. Researchers at the University of Kuopio report that regular fish consumption reduces the risk of depression and suicide. Their study involved 1767 Finnish men and women who were evaluated for depression and suicidal tendencies using the 21-item Beck Depression Inventory. They were also asked about their fish consumption. The researchers conclude that people who consume fish twice a week or more have a 37 per cent lower risk of being depressed and a 43 per cent lower risk of having thoughts of harming themselves (suicidal tendencies). The results are consistent with those of a large Japanese study involving 265,000 subjects who were followed up for 17 years. This study found a decreased risk of suicide among people who consumed fish daily. Dr. Andrew Stoll, MD of the Harvard Medical School points out that Icelanders who consume a lot of seafood have far lower rates of seasonal affective disorder (SAD) than do inhabitants of other countries situated at similar latitudes. Both Dr. Stoll and the Finnish researchers urge large-scale trials to conclusively determine whether it is appropriate to recommend increased fish intake or fish oil supplementation to depressed people or indeed to the population as a whole. *Tanskanen, Antti, et al. Fish consumption, depression, and suicidality in a general population. Archives of General Psychiatry, Vol. 58, May 2001, pp. 512-13 /*

Dementia associated with low DHA levels

GUELPH, CANADA. Dementia now affects about 47% of the population over 80 years of age in Western countries. The incidence of Alzheimer's disease, a leading cause of dementia, is growing especially rapidly. There is no cure for Alzheimer's disease (AD) and it is not at all clear what causes it. Researchers at the University of Guelph now report that they have found low levels of long-chain polyunsaturated fatty acids, notably DHA (docosahexaenoic acid) in people suffering from AD and dementia. The study involved 84 people (aged 80 years or older) who were given a thorough clinical evaluation. Nineteen of the people were diagnosed as having AD, 10 as having non-AD dementia, 36 were characterized as non-demented but cognitively impaired, and 19 had normal cognitive functioning. Blood samples were obtained from all participants and analyzed for fatty acids in the phospholipid phases of the plasma. The researchers observed significantly lower levels of EPA (by about 42%), DHA (by 17-33%) and total omega-3 fatty acids (by 23-28%) in the plasma phospholipids phase of the patients with AD, other dementia and cognitive impairment (non-demented) than in the normal controls. DHA is highly concentrated in the cerebral cortex and a deficiency in blood plasma is likely to translate into a deficiency in the brain. Other research has confirmed the association between low DHA and EPA levels and impaired cognitive function. Other studies have found that fish oil supplementation improves mood, cooperation, appetite, sleep, and short-term memory in AD patients. The Guelph researchers conclude that an effort should be made to increase the intake of fish or fish oils in the population at large and the elderly in particular. *Conquer, Julie A., et al. Fatty acid analysis of blood plasma of patients with Alzheimer's disease, other types of dementia, and cognitive impairment. Lipids, Vol. 35, December 2000, pp. 1305-12/*

EPA cures schizophrenia

LONDON, UK. There is evidence that schizophrenia is associated with an abnormal metabolism of unsaturated fatty acids in both blood plasma and red blood cells. This abnormality, in turn, is associated with extraordinary low levels of long-chain unsaturated fatty acids such as EPA (eicosapentaenoic acid), DHA (docosahexaenoic acid), and AA (arachidonic acid) in cell membranes. Researchers at the Imperial College School of Medicine now report that fatty acid levels can be restored to normal and schizophrenia symptoms eliminated or at least vastly diminished by oral supplementation with EPA, the major component of fish oils. Their experiment involved a 30-year-old man who had suffered from schizophrenia for over 10 years. He had frequent (at least daily) hallucinations and also suffered from persecutory delusions and thought disorder. The patient was put on 2 grams/day of EPA and was evaluated for schizophrenia symptoms and blood plasma and red blood cell membrane levels of fatty acids at monthly intervals for 6 months. The results were spectacular. After 6 months the overall score for schizophrenia symptoms had dropped by a factor of 6 (an 85% reduction in severity). Episodes of delusions were completely eliminated and there was an 88% reduction in the number of hallucinatory episodes. The remarkable clinical improvement in symptoms was associated with substantial increases in the levels of EPA, DHA and AA in red blood cell membranes and with significant increases in EPA and DHA levels in blood plasma. The researchers conclude that EPA supplementation is able to reverse the abnormal fatty acid profiles found in schizophrenics and that this reversal is associated with, and is likely to be the cause of, the clinical improvement. *Richardson, A.J., et al. Red cell and plasma fatty acid changes accompanying symptom remission in a patient with schizophrenia treated with eicosapentaenoic acid. European Neuropsychopharmacology, Vol. 10, 2000, pp. 189-93/*

Fish oil supplementation helps schizophrenia patients

OXFORD, UK. The Cochrane Library, a prestigious medical think-tank dedicated to the development of evidence-based medicine, has just released a review of the evidence concerning the use of polyunsaturated fatty acids (fish oils and evening primrose oil) in the treatment of schizophrenia. A wide-ranging literature survey revealed 4 studies that met the Library's stringent quality measures. The most recent study (Shah 2000) included 30 newly diagnosed schizophrenia patients who were not on antipsychotic drugs at the beginning of the trial. The patients were randomized to receive either a placebo or a daily dose of eicosapentaenoate (quantity not specified). At the end of the 12 weeks all the patients in the placebo group needed to be placed on antipsychotic drugs. Only 9 of the 15 patients in the active treatment group needed these drugs after the 12 weeks. Another study (Peet 1997) compared evening primrose oil supplementation with placebo in 43 schizophrenics. The patients' mental state was not improved in either the placebo or the treatment group after 12 weeks. A third study involving 29 schizophrenics compared supplementation with fish oil to evening primrose oil and found fish oil superior. The researchers conclude that fish oils may be useful in the treatment of schizophrenia and that medical doctors should not discourage their patients from taking fish oil supplements. They add that fish oils seem to be well tolerated and free of adverse effects. *Joy, CB, et al. Polyunsaturated fatty acid (fish or evening primrose oil) for schizophrenia. The Cochrane Library, Issue 4, 2000/*

Dieting and depression

TUCSON, ARIZONA. Low-fat diets have been widely promoted for lowering cholesterol levels, for reducing body weight, and for preventing certain types of cancer. At least one study, however, has found that although a reduction in cholesterol may reduce mortality from heart disease it may increase the incidence of fatal accidents, violent deaths, suicides, and depression. Researchers at the University of Arizona now believe that they may have found an explanation for this phenomenon. They point out that fat restriction and cholesterol-lowering drugs may change the

concentrations of polyunsaturated fatty acids (PUFAs) in the tissues including nerve tissue (neurons). Fat-restricting diets usually lead to a relative increase in the intake of omega-6 PUFAs and a relative decrease in the intake of omega-3 fatty acids. This can have serious consequences inasmuch as the omega-3 fatty acids, eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) found in fish oils, are crucial for the proper functioning of the nervous system. Several large-scale studies have found a clear association between low blood levels of EPA and DHA and an increased risk of depression, violence and suicide; a recent study in Japan found that DHA supplementation reduced aggression among healthy Japanese students. Epidemiologic studies have found a clear correlation between a low intake of EPA and DHA and the prevalence of depression. In two studies of population groups in the USA the incidence of depression was found to be 3.7% and 2.9%. Average intake of EPA and DHA in the USA is estimated to be about 0.1 gram per day. In two Japanese studies, on the other hand, the incidence of depression was only 0.9% and 0% and the intake of EPA plus DHA was 1.5 grams per day and 4.2 grams/day respectively. Other studies have shown that on-off dieting can produce a serious imbalance in the ratio of fatty acids and may lead to depression. The researchers conclude that an extremely low-fat diet may be counter-productive and have deleterious psychological ramifications. They stress that dietary advice regarding cholesterol reduction, weight loss, and cancer prevention should emphasize the importance of an adequate intake of omega-3 fatty acids. *Bruinsma, Kristen A. and Taren, Douglas L. Dieting, essential fatty acid intake, and depression. Nutrition Reviews, Vol. 58, April 2000, pp. 98-108 [116 references] /*

Low docosahexaenoic acid levels and Alzheimer's disease

BOSTON, MASSACHUSETTS. Docosahexaenoic acid (DHA), a major component of fish oils, is the most important fatty acid in the brain and retina and makes up more than 30% of the structural lipid (fat) in neurons. There is ample evidence that a deficiency of DHA is associated with depression, attention deficit hyperactivity disorder, and dementia. Clinical studies have shown that an increased intake of DHA may benefit patients with dyslexia and Alzheimer's disease. Researchers at Boston University and Tufts University School of Medicine now report that they have found a clear association between low blood levels (in the phosphatidylcholine fraction of serum) of DHA and the risk of developing Alzheimer's disease. Their study involved 1188 elderly Americans (mean age of 75 years) who had blood samples drawn and analyzed for DHA in 1985. Sixteen of the participants had clinically diagnosed Alzheimer's at the time of blood sampling. The researchers noted that 11 of the 16 (69%) had DHA levels in the lower half of the DNA distribution. The remaining 1172 participants were followed for 10 years. Again the researchers noted that participants with DHA levels in the lower half of the distribution had a 67% greater risk of developing Alzheimer's disease. The researchers suggest that maintaining adequate levels of DHA through the consumption of fish or dietary supplements rich in DHA may be particularly important for the elderly. *Kyle, D.J., et al. Low serum docosahexaenoic acid is a significant risk factor for Alzheimer's dementia. Lipids, Vol. 34 (suppl), 1999, p. S245/*

Fish oils and manic-depressive illness

BOSTON, MASSACHUSETTS. Manic-depressive illness (bipolar disorder) is a common, severe mental illness involving repeated episodes of depression, mania (rapid mood changes, hyperactivity, and excessive cheerfulness) or both. It is usually treated with drugs such as lithium carbonate or valproate. Unfortunately, these drugs are not very effective and recurrence rates are high. It is generally believed that bipolar disorder involves an overactivity in the neuronal signal pathways. Omega-3 fatty acids are known to dampen this overactivity and the hypothesis has been advanced that they may be useful in the treatment of bipolar disorder. Medical scientists have now confirmed this in a landmark study just completed at the Harvard Medical School. The double-blind, placebo-controlled study involved 30 patients (men and women 18 to 65 years of age) who had all been diagnosed with bipolar disorder. Half the patients were given seven fish oil capsules twice a day while the placebo group were given seven olive oil capsules twice a day.

Each fish oil capsule contained 440 mg of eicosapentaenoic acid and 240 mg of docosahexaenoic acid. All of the participants except four in the fish oil group and four in the placebo group also continued to receive a standard mood-stabilizing drug prescribed previously. The mental state of the participants was measured using four scales (Clinical Global Impression Scale, Global Assessment Scale, Young Mania Rating Scale, and the Hamilton Rating Scale for Depression) at the start of the study and after two, four, six, eight, twelve and sixteen weeks. Twelve of the 14 participants in the fish oil group completed the four-month study without major episodes of mania or depression as compared to only six out of 16 participants in the placebo group. Also, while nine of the placebo group members experienced worsening depression none of the fish oil group members did. The four patients in the fish oil group who had not been prescribed mood-stabilizing drugs all completed the study without major episodes, but only one member in the placebo group not on mood-stabilizing drugs did. The average decline in depression rating on the Hamilton Scale was almost 50 per cent in the fish oil group as compared to an increase of 25 per cent in the control group. The Harvard researchers urge further trials of fish oils in the treatment of depression and manic-depressive illness. *Stoll, Andrew L., et al. Omega 3 fatty acids in bipolar disorder. Archives of General Psychiatry, Vol. 56, May 1999, pp. 407-12 and pp. 415-16 (commentary) Calabrese, Joseph R., et al. Fish oils and bipolar disorder. Archives of General Psychiatry, Vol. 56, May 1999, pp. 413-14 (commentary)/*

Omega-3 fatty acids: the missing link

BERLIN, GERMANY. Dr. Emanuel Severus of the Berlin University points out that major depression is characterized by a deficiency of omega-3 fatty acids and that these acids possess powerful antiarrhythmic properties. He suggests that the missing link in the recently established association between major depression and sudden cardiac death may be the omega-3 fatty acid deficiency which characterizes both conditions. *Severus, W. Emanuel, et al. Omega-3 fatty acids: the missing link? Archives of General Psychiatry, Vol. 56, April 1999, pp. 380-81 (letter to the editor)/*

Fish consumption and depression

ROCKVILLE, MARYLAND. Dr. Joseph Hibbeln, a researcher at the National Institute on Alcohol Abuse and Alcoholism reports in a letter to *The Lancet* that he has found a convincing correlation between fish consumption and the incidence of major depression. Dr. Hibbeln correlated the annual incidence of major depression per 100 people in nine countries with the consumption of fish. He found a high incidence of depression in countries with low fish consumption. New Zealand with an annual fish consumption of only 40 lbs had an annual incidence rate of depression of 5.8 per cent while Korea with a fish consumption of more than 100 lbs/year had an annual incidence rate of only 2.3 per cent. Japan with a fish consumption of almost 150 lbs/year had the lowest incidence of major depression (0.12 per cent). Dr. Hibbeln cautions that various economic, social, cultural and other factors could have influenced his results, but points out that high blood plasma concentrations of docosahexaenoic acid, an essential fatty acid found in fish, has been linked to increased serotonin turnover and lower incidences of depression and suicide. *Hibbeln, Joseph R. Fish consumption and major depression. The Lancet, Vol. 351, April 18, 1998, p. 1213 (correspondence)/*

Omega-3 fatty acid deficiency linked to depression

SHEFFIELD, UNITED KINGDOM. The composition of cell membranes has a profound effect on membrane-related proteins such as enzymes and receptors and there is considerable evidence that cell membrane structure is a significant factor in depression. This structure in turn is highly dependent on the presence of certain essential fatty acids, notably docosahexaenoic acid (DHA). Researchers at the University of Sheffield and the Efamol Research Institute in Nova Scotia now

report that they have found a highly significant association between severity of depression and the levels of omega-3 fatty acids in both the diet and the red blood cell membranes. Their study involved 10 patients with major depression and 14 healthy control subjects with no history of psychiatric disorder (average age of participants was 39 years). All participants had blood samples taken and analyzed for essential fatty acid (EFA) content and also completed a questionnaire to determine their dietary intake of EFAs over the 7 days prior to enrollment. The severity of depression was found to be inversely proportional with the red blood cell level and dietary intake of omega-3 fatty acids. The correlation between a low level of alpha-linolenic acid in blood cells and depression and between low blood cell levels of DHA and depression were particularly strong. No correlation was found between red blood cell levels of omega-6 fatty acids and depression. However, there was a slight positive correlation between dietary intake of omega-6s and severity of depression when both patients and controls were considered in one group. The researchers conclude that low levels of omega-3 fatty acids in cell membranes are associated with depression. They speculate that supplementation with omega-3 fatty acids may be useful in alleviating depression. *Edwards, Rhian, et al. Omega-3 polyunsaturated fatty acid levels in the diet and in red blood cell membranes of depressed patients. Journal of Affective Disorders, Vol. 48, 1998, pp. 149-55/*

DHA levels linked to suicide and violence

BETHESDA, MARYLAND. Several studies have found a link between low cholesterol levels and an increased tendency to violence, suicide, and depression. Scientists at the National Institute on Alcohol Abuse and Alcoholism believe that the real culprit in this association is low concentrations of 5-hydroxyindoleacetic acid (5-HIAA) in the cerebrospinal fluid and that it is the blood level of polyunsaturated fatty acids rather than the levels of cholesterol which affect 5-HIAA levels. 5-HIAA is a metabolite of serotonin. To test this hypothesis the researchers measured the levels of cerebrospinal 5-HIAA and the levels of blood plasma polyunsaturated fatty acids in a group of 176 subjects. Forty-nine of the subjects were healthy volunteers, 88 were early-onset alcoholics (excessive alcohol use prior to their 25th birthday), and 39 were late-onset alcoholics. None of the alcoholics had been drinking for at least 21 days prior to the test. The researchers found a strong positive correlation between blood levels of docosahexaenoic acid (DHA) and the level of 5-HIAA in the healthy volunteers. In other words, the higher the DHA levels the higher the 5-HIAA levels and as a corollary, the lower the tendency to depression, violence and suicide. In the early-onset alcoholics the situation was completely reversed. Higher DHA levels corresponded to lower 5-HIAA levels and thus a possibly increased tendency to violence, suicide and depression. The researchers found no correlation between 5-HIAA levels and total cholesterol levels. They conclude that further studies are required to determine if supplementation with essential fatty acids, notably DHA, can influence central nervous system serotonin and dopamine metabolism and modify impulsive behaviour related to these neurotransmitters. *Hibbeln, Joseph R., et al. Essential fatty acids predict metabolites of serotonin and dopamine in cerebrospinal fluid among healthy control subjects, and early- and late-onset alcoholics. Biological Psychiatry, Vol. 44, 1998, pp. 235-42 /*

Your brain needs DHA

NEW YORK, NY. Dr. Barbara Levine, Professor of Nutrition in Medicine at Cornell University, sounds the alarm concerning a totally inadequate intake of DHA (docosahexaenoic acid) by most Americans. DHA is the building block of human brain tissue and is particularly abundant in the grey matter of the brain and the retina. Low levels of DHA have recently been associated with *depression, memory loss, dementia*, and visual problems. DHA is particularly important for fetuses and infants; the DHA content of the infant's brain triples during the first three months of life. Optimal levels of DHA are therefore crucial for pregnant and lactating mothers. Unfortunately, the average DHA content of breast milk in the United States is the lowest in the world, most likely because Americans eat comparatively little fish. Making matters worse is the fact that the United

States is the only country in the world where infant formulas are not fortified with DHA. This despite a 1995 recommendation by the World Health Organization that all baby formulas should provide 40 mg of DHA per kilogram of infant body weight. Dr. Levine believes that postpartum depression, attention deficit hyperactivity disorder (ADHD), and low IQs are all linked to the dismally low DHA intake common in the United States. Dr. Levine also points out that low DHA levels have been linked to low brain serotonin levels which again are connected to an increased tendency to *depression*, suicide, and violence. DHA is abundant in marine phytoplankton and cold-water fish and nutritionists now recommend that people consume two to three servings of fish every week to maintain DHA levels. If this is not possible, Dr. Levine suggests supplementing with 100 mg/day of DHA. *Levine, Barbara S. Most frequently asked questions about DHA. Nutrition Today, Vol. 32, November/December 1997, pp. 248-49/*

Fish consumption slows mental decline

ROTTERDAM, THE NETHERLANDS. Dutch researchers report an intriguing association between diet and the extent and rate of cognitive impairment in older men. Their study, part of the Zutphen Elderly Study, involved almost 1000 men born between 1900 and 1920. The men's intake of various food components was assessed (by personal interviews) in 1985 and 1990 and their cognitive function was evaluated in 1990 and 1993 using the Mini-Mental State Examination scale. The MMSE scale includes questions on orientation to time and place, registration, attention and calculation, recall, language, and visual construction. The researchers found that men with the highest intake of linoleic acid (mainly from margarine, butter, baking fats, sauces, and cheeses) had a 76% higher degree of cognitive impairment than did men with the lowest intake. This association held true even after adjusting for age, level of education, cigarette smoking, alcohol consumption, and calorie intake. The intake of omega-3 fatty acids, on the other hand, was not associated with any degree of impairment. Men with a high fish intake were less likely to be cognitively impaired than men with a low intake and their rate of decline over the period 1990-93 was half that of men rarely consuming fish. The intake of beta-carotene, flavonoids, and vitamins C and E was not associated with a greater or lesser degree of impairment. However, there was a clear correlation between a high vitamin C intake and a decline in cognitive function over the period 1990-93. Men with a high vitamin C intake were twice as likely to have experienced a decline as were men with a low intake. The researchers speculate that vitamin C may act as a pro-oxidant in the presence of free iron in the brain. *Kalmijn, S., et al. Polyunsaturated fatty acids, antioxidants, and cognitive function in very old men. American Journal of Epidemiology, Vol. 145, January 1, 1997, pp. 33-41 /*

Fatty acid profile linked to depression

MELBOURNE, AUSTRALIA. Depression is becoming increasingly prevalent in Western society. Some researchers believe that part of the reason for this can be traced to major dietary changes which have taken place over the past century. During this time there has been a large increase in the intake of saturated fats and linoleic acid (LA)-rich vegetable oils at the expense of alpha-linolenic acid (ALA)-rich foods such as fish and wild game. It is estimated that the ratio between LA-type (n-6) polyunsaturated fatty acids (PUFAs) and ALA-type (n-3) PUFAs has risen from 1:1 to 10:1 or higher. Some researchers have postulated that the sharp rises in depression and other neurological disorders are closely related to the increased intake of LA-rich vegetable oils. Now researchers at the Royal Melbourne Institute of Technology report that the severity of depression is indeed directly associated with the ratio of LA- to ALA-type PUFAs in red blood cells. Their study involved 20 moderately to severely depressed patients. The severity of depression was determined using the 21-item Hamilton depression rating scale and a second scale which omitted anxiety symptoms. All patients had blood samples drawn and analyzed for arachidonic acid (AA) - the major metabolite of linoleic acid, and EPA - the major metabolite of alpha-linolenic acid and the main constituent of fish oils. The researchers found a clear correlation between a high AA/EPA ratio and increased severity of depression. There was also a significant association

between a low level of EPA in the red blood cells and increased severity of depression. The researchers conclude that there is a definite relationship between high AA/EPA ratios and increased severity of depression, but are not certain whether the fatty acid imbalance causes depression or whether depression results in a high AA/EPA ratio. They suggest that further studies be done to determine the benefits of supplementation aimed at increasing tissue levels of EPA and thereby decreasing the AA/EPA ratio. *Adams, Peter B., et al. Arachidonic acid to eicosapentaenoic acid ratio in blood correlates positively with clinical symptoms of depression. Lipids, Vol. 31 (suppl), 1996, pp. S157-S61/*

Fish oils alleviate schizophrenia symptoms

SHEFFIELD, UNITED KINGDOM. Schizophrenia is a serious mental illness characterized by such symptoms as delusions, hallucinations, emotional blunting, and social withdrawal. There is growing evidence that abnormalities in cell membrane fatty acid composition is involved in the disease. Researchers at the Northern General Hospital have just completed a study of the composition of red blood cell membranes in 23 drug-treated schizophrenic patients. They found that the patients had low levels of arachidonic acid (AA), linoleic acid (LA), eicosapentaenoic acid (EPA), and docosahexaenoic acid (DHA) when compared to healthy controls. They also noted that the schizophrenics had higher levels of thiobarbituric acid reactive substances (TBARS) in their blood plasma indicating that the depletion of the fatty acids in the red blood cells might be due to an increase in oxidative breakdown reactions rather than to impaired incorporation of the fatty acids into the membranes. A more recent study by the same researchers evaluated the effect of fish oil supplementation on the severity of schizophrenic symptoms in a group of 24 patients. They were given 10 grams/day of concentrated fish oil for a six-week period. The supplementation resulted in a marked increase in EPA and other omega-3 fatty acids in the red blood cell membranes and a concomitant decrease in omega-6 fatty acid levels. The researchers also noted a significant decrease in the severity of symptoms during the supplementation period. Interestingly enough, none of the patients were clinically deficient in fatty acid intake prior to supplementation, but a correlation between higher EPA intake and less severe symptoms was clearly evident. The researchers conclude that schizophrenia is somehow related to an abnormal fatty acid metabolism and urge larger clinical trials to evaluate the potential benefits of omega-3 fatty acid supplementation in the treatment of this disorder. / Laugharne, J.D.E., et al. Fatty acids and schizophrenia. *Lipids, Vol. 31 (suppl), 1996, pp. S163-S65 /*

Docosahexaenoic acid fights depression

ROCKVILLE, MARYLAND. Researchers at the National Institute of Alcohol Abuse and Alcoholism believe that the increasing rates of depression seen in North America over the last 100 years are due to a significant shift in the ratio of n-6 (arachidonic acid, linoleic acid) to n-3 (docosahexaenoic acid, linolenic acid) fatty acids in the diet. The human race evolved on a diet having a ratio of about 1:1 of these acids; it is now estimated to be between 10:1 and 25:1. Docosahexaenoic acid (DHA) is a main component of the synaptic membranes and a lack of it has been linked to depression. Fish oils are a rich source of DHA and it can also be biosynthesized in the body from linolenic acid. The researchers speculate that the depressions which often accompany alcoholism, multiple sclerosis, and childbirth (postpartum depression) are all due to a lack of DHA and can be corrected by increasing the dietary intake of DHA or linolenic acid (flax seed oil). They also point out that depression and coronary heart disease are strongly associated and that a low intake of n-3 fatty acids has been linked to both. *Hibbeln, Joseph R. and Salem, Norman. Dietary polyunsaturated fatty acids and depression: when cholesterol does not satisfy. American Journal of Clinical Nutrition, Vol. 62, July 1995, pp. 1-9/*

Fish oils help patient with Alzheimer's disease

MURRAYVILLE, VICTORIA, AUSTRALIA. Dr. Robert Peers, an Australian family physician, reports on the case of a 77-year-old farmer diagnosed with Alzheimer's disease (confirmed by a neurologist). The patient, when first admitted to a nursing home, was restless and destructive and unable to dress himself. After several months he became calmer, regained weight, and was again able to dress himself. Dr. Peers ascribes the changes to the fact that the nursing home served fish every week thus providing the patient with long-chain omega-3 fatty acids which had been missing in his previous diet. In the five years prior to being diagnosed with Alzheimer's disease (AD) the farmer had been in the habit of just frying up meat, rice and vegetables in an omega-6 vegetable oil. Dr. Peers provides a compelling scientific explanation of the reasons why a deficiency in docosahexaenoic acid (DHA), a main component of fish oil, may lead to Alzheimer's disease. He suggests that patients with AD should be queried about an excessive intake of omega-6 fatty acids (from vegetable oils and margarine) and a deficient intake of omega-3 fatty acids. If an imbalance is observed it should be treated with fish oil supplementation. He points out that DHA is quickly taken up by the brain and hypothesizes that fish oil supplementation may not only improve Alzheimer's symptoms, but may even prevent the disease from progressing further. Two other Australian physicians, Drs. Simons and Broe, find Dr. Peers' observation interesting, but caution that considerably more research needs to be done for fish oil supplementation to be recognized as an effective treatment for AD. / Peers, Robert J. Alzheimer's disease and omega-3 fatty acids: hypothesis. *Medical Journal of Australia*, Vol. 153, November 5, 1990, pp. 563-64 (letter) / Coromega *Additional References* 1. Maes, M., et al. Lowered omega-3 polyunsaturated fatty acids in serum phospholipids and cholesteryl esters of depressed patients. *Psychiatry Research*, Vol. 85, March 22, 1999, pp. 275-91 *Conclusion:* Depression is associated with low levels of omega-3 fatty acids. 2. Peet, M., et al. Depletion of omega-3 fatty acid levels in red blood cell membranes of depressive patients. *Biological Psychiatry*, Vol. 43, March 1, 1998, pp. 315-19 *Conclusion:* Depression is associated with low levels of omega-3 fatty acids. *OILOFPISCES.COM* *INTERNATIONAL HEALTH NEWS* Copyright © 2006 by Hans R. Larsen Oilofpisces.com does not provide medical advice. Do not attempt self- diagnosis or self-medication based on our reports. Please consult your health-care provider if you wish to follow up on the information presented.