

Hi,

Children and adults with atopic allergies (IgE-mediated, skin test positive, Type 1 allergies) have an unusually high prevalence of ADHD, anti-social aggressive behavior, learning disorders, migraine headaches, and epilepsy, all commonly IgG-mediated, delayed-onset Type 2 food allergy-related conditions (wheat and milk always listed among the top 5 offending foods).

A look at the intestinal mucosa's immunological picture finds an imbalance of T lymphocyte helper cells (Th2 predominating over Th1) in these people.

Probiotics (friendly bacteria), plant sterols, mother's breast milk, and omega-3 fish oils all seem to help bring the Th cells back into balance, with the Th1 cells (and their respective cytokines) now predominating.

Also, note below the critical role fish oils play in inflammatory diseases of the brain, skin, heart, airway, digestive tract, joints, immune system & elsewhere.

My suggestion: we strongly recommend oily fish consumption to all of our gluten sensitive and food allergic readers.

Read on....

OMEGA 3 oils favorably change the Th1 to Th2 ratio in digestive tract, lowering risk of atopic allergies.

Abstract

The increase in the prevalence of atopic diseases has recently been linked to altered consumption of polyunsaturated fatty acids (PUFAs).

As typical Western diets contain almost 10 times more linoleic acid (18:2 omega-6 = seed & vegetable oils) than alpha-linolenic acid (18:3 omega-3) [and fish oil = 20 & 22:3 omega-3], it is the metabolism of the former that predominates.

Subsequently produced arachidonic acid-derived eicosanoids alter the balance of T-helper cells type 1 and type 2 thus favoring the production of immunoglobulin (Ig)E. In atopic subjects, the impact of this excessive eicosanoid production may be further strengthened as a result of changes in cyclic nucleotide metabolism exacerbated by substrate availability. Dietary omega-3 fatty acids can have marked influence on both specific and nonspecific immune responses in modifying eicosanoid production and replacing omega-6 fatty acids in cell membranes. Therefore, it is concluded that careful manipulation of dietary PUFAs may play a key role in the successful management of inflammation associated with atopic diseases.

Kankaanpää P; Sütas Y; Salminen S; Lichtenstein A; Isolauri E Department of Biochemistry and Food Chemistry, University of Turku, Finland.

pasi.kankaanpaa@utu.fi Dietary fatty acids and allergy. Ann Med, 1999 Aug; volume 31:4, 282-287.

What's beneficial in fish?

1. Omega 3 oils, EPA and DHA
2. Selenium
3. Biologically active di-, tri- and larger peptides

4. Creatine
5. Taurine (highest concentration of all animal proteins)
6. Sterols (which lower total & LDL cholesterol, inhibit IL-6, TNF while increasing DHEA and suppressing cortisol levels! Good for fibromyalgia, osteoarthritis, hay fever, osteoporosis, etc)

Health Benefits of DHA from fish oil

Abstract

Docosahexaenoic acid (DHA) --

DHA is present in fatty fish (salmon, tuna, trout, Alaskan halibut, and mackerel, e.g.) and mother's milk.

*DHA is present at low levels in meat and eggs, but is **not usually present in infant formulas.***

(EPA, another long-chain n-3 fatty acid, is also present in fatty fish

- *The shorter chain n-3 fatty acid, alpha-linolenic acid, is not converted very well to DHA in man.)*

These long chain n-3 fatty acids (also known as omega-3 fatty acids) are now becoming available in some foods, especially infant formula and eggs in Europe and Japan.

DHA is taken up by the brain in preference to other fatty acids. The turnover of DHA in the brain is very fast, more so than is generally realized.

- 1. is essential for the growth and functional development of the brain in infants.*
- 2. DHA is also required for maintenance of normal brain function in adults.*

3. The inclusion of plentiful DHA in the diet improves learning ability, whereas deficiencies of DHA are associated with deficits in learning. The visual acuity of healthy, full-term, formula-fed infants is increased when their formula includes DHA. During the last 50 years, many infants have been fed formula diets lacking DHA and other omega-3 fatty acids.

DHA deficiencies are associated with

4. fetal alcohol syndrome,
- 5. attention deficit hyperactivity disorder,**
6. cystic fibrosis,
7. phenylketonuria,
- 8. unipolar depression,**
9. **aggressive hostility**, and
10. adrenoleukodystrophy.

Decreases in DHA in the brain are associated with

- 11. cognitive decline during aging and**
- 12. with onset of sporadic Alzheimer disease.**

The leading cause of death in western nations is cardiovascular disease. Epidemiological studies have shown

13. a strong correlation between fish consumption and reduction in sudden death from myocardial infarction. The reduction is approximately 50% with 200 mg day of DHA from fish. DHA is the active component in fish. Not only does
14. fish oil reduce triglycerides in the blood and
15. decrease thrombosis, but

16. it also prevents cardiac arrhythmias.

17. The association of DHA deficiency with depression is the reason for the robust positive correlation between depression and myocardial infarction. Patients with cardiovascular disease or Type II diabetes are often advised to adopt a low-fat diet with a high proportion of carbohydrate. A study with women shows that this type of diet increases plasma triglycerides and the severity of Type II diabetes and coronary heart disease.

18. Fish oil decreases the proliferation of tumor cells, whereas arachidonic acid, a long chain n-6 fatty acid, increases their proliferation.

19. These opposite effects are also seen with inflammation, particularly with rheumatoid arthritis, and with asthma.

20. DHA has a positive effect on diseases such as

- hypertension,
- arthritis,
- atherosclerosis,
- depression,
- adult-onset diabetes mellitus,
- myocardial infarction, thrombosis,
- and some cancers.

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Horrocks LA et al. Health benefits of docosahexaenoic acid (DHA). Pharmacol Res, 1999 Sept; volume 40:3: pages 211-225.

Omega 3 fatty acids contributions to infant eye and brain development:

Omega-3 fatty acids are also referred to as DHA (docosahexaenoic acid).

- ❑ **DHA is critical to normal eye and vision development.**
- ❑ **Along with another fatty acid called linoleic acid, it accounts for more than a third of the fatty acids in the brain and the retina of the eye. Most of the accumulation of DHA occurs during the last trimester of fetal development, which is why**
- ❑ **premature babies are at higher risk for irreversible nerve and visual damage.**
- ❑ **Thus, pregnant women are encouraged to eat fish at one or two meals per week. However, they should avoid swordfish, shark, fresh tuna and all freshwater fish, due to the risk of heavy metal and pesticide contamination. (Don't depend on fish-oil pills: They are not regulated and their quality cannot be guaranteed.)**

Omega 3 deficiency & ADHD₄

Abstract

The purpose of the study reported here was to compare behavior, learning, and health problems in boys ages 6 to 12 with lower plasma phospholipid total omega-3 or total omega-6 fatty acid levels with those boys with higher levels of these fatty acids.

- ❑ ***A greater frequency of symptoms indicative of essential fatty acid deficiency was reported by the parents of subjects with lower plasma omega-3 or omega-6 fatty acid concentrations than those with higher levels.***
 1. A greater number of behavior problems, assessed by the Conners' Rating Scale,
 2. temper tantrums, and
 3. sleep problems

were reported in subjects with lower total omega-3 fatty acid concentrations. Additionally,

4. more learning problems and
5. health problems

were found in subjects with lower total omega-3 fatty acid concentrations. (Only more colds and more antibiotic use were reported by those subjects with lower total omega-6 fatty acids).

These findings are discussed in relation to recent findings for omega-3 experimentally deprived animals.

Stevens LJ et al. Department of Foods and Nutrition, Purdue University. Omega-3 fatty acids in boys with behavior, learning, and health problems. Physiol Behav, 1996 Apr; volume 59:4-5: pages 915-920.

Essential fatty acids in health and chronic disease^{2 5}

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¹ From The Center for Genetics, Nutrition and Health, Washington, DC.

Human beings evolved consuming a diet that contained about equal amounts of n-3 and n-6 essential fatty acids.

- **Over the past 100–150 y there has been an enormous increase in the consumption of n-6 fatty acids due to the increased intake of vegetable oils from corn, sunflower seeds, safflower seeds, cottonseed, and soybeans. Today, in Western diets, the ratio of n-6 to n-3 fatty acids ranges from 20–30:1 instead of the traditional range of 1–2:1.**

Studies indicate that a high intake of n-6 fatty acids shifts the physiologic state to one that is

- prothrombotic and proaggregatory, characterized by increases in blood viscosity, vasospasm, and vasoconstriction and decreases in bleeding time.

n-3 Fatty acids, however, have

- **anti-inflammatory,**
- **antithrombotic,**
- **antiarrhythmic,**
- **hypolipidemic, and**

- **vasodilatory properties**

These beneficial effects of n-3 fatty acids have been shown in the secondary prevention of

- 1. coronary heart disease,**
- 2. hypertension,**
- 3. type 2 diabetes,**
- 4. asthma**
- 5. major depression**
- 6. ADHD**
- 7. Eczema and, in some patients with**
- 8. renal disease,**
- 9. rheumatoid arthritis,**
- 10. ulcerative colitis,**
- 11. Crohn's disease, and**
- 11. chronic obstructive pulmonary disease.**

Most of the studies were carried out with

- **fish oils [eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA)].**
- **However, alpha-linolenic acid, found in green leafy vegetables, flaxseed, rapeseed, and walnuts,**

desaturates and elongates in the human body to EPA and DHA and by itself may have beneficial effects in health and in the control of **chronic** diseases.

Oily Fish Deficiency Contributes to Mental Illnesses worldwide 6

Tuesday, 23 May, 2000, 10:27 GMT 11:27 UK

Oily Fish deficiency 'could harm mental health'

A fish-rich diet could protect from mental disease

Oily fish is increasingly missing from the diets of young *[and old]* people - and a leading nutritionist says this could harm their mental health *[especially ADHD, clinical (major) depression and suicide]*.

The rates of mental illness and depression are increasing globally *[5% of Americans--over 13 million-- clinically depressed right now, most of whom have not been detected and treated]*

There is evidence that a chemical, Omega-3, found particularly in oily fish such as mackerel, herring, salmon and sardines has some effect on brain development. *[more specifically, docosahexaenoic acid (DHA) from oily fish]*

Professor Michael Crawford, director of the Institute of Brain Chemistry and Human Nutrition at North London University, said: "We need to get back to feeding *[and DHA supplementing]* our minds as well as our bodies, otherwise the future of the nation is grim.

- **"We should all be eating oily fish at least once a week."**
- **An NOP poll showed a particular decrease in fish consumption among the young.**

Fish free

Three-quarters of 15 to 24-year-olds in the UK eat oily fish less than once a week.

Looking at all ages, almost a quarter never eat oily fish.

- **The average amount of fish eaten per person per week in the UK is thought to have halved over the past five decades.**

Professor Crawford said: "A diet of fish containing Omega-3 was essential for the necessary cerebral expansion which transformed our predecessors into homo sapiens.

"Brain capacity expanded rapidly in our prehistoric ancestors living in east Africa near large freshwater lakes.

- "Medical experts have long known of the benefits of oily fish in the fight against heart disease [arthritis and eye disease, as well], but it is just as vital as brain food."

The National Institute of Medical Health in the US is currently sponsoring a study to examine the effectiveness of Omega-3 in treating a mental illness called bipolar depressive disorder.

In the UK, attempted suicide has shown a sharp increase over the last decade.

Depression ass. with low omega 3 oils

7

Abstract

Depression is associated with

- 1. a lowered degree of esterification of serum cholesterol,**
- 2. an increased C20:4 omega6-to-C20:5 omega3 ratio and**
- 3. decreases in omega3 fractions in fatty acids (FAs) or in the red blood cell membrane.**

The aims of the present study were to examine: (i) serum phospholipid and cholesteryl ester compositions of individual saturated fatty acids (SFAs), monounsaturated FAs (MUFAs) and

polyunsaturated FAs (PUFAs) in major depressed patients vs. healthy volunteers; (ii) the relationships between the above FAs and lowered serum zinc (Zn), a marker of the inflammatory response in depression; and (iii) the effects of subchronic treatment with antidepressants on FAs in depression. The composition of the FAs was determined by means of thin layer chromatography in conjunction with gas chromatography. Lipid concentrations were assayed by enzymatic colorimetric methods. The oxidative potential index (OPI) of FAs was computed in 34 major depressed inpatients and 14 normal volunteers.

Major depression was associated with:

increased MUFA and C22:5omega3 proportions and

- **increased C20:4 omega6/C20:5 omega3 and C22:5omega6/C22:6 omega3 ratios;**

lower C22:4omega6, C20:5omega3 and C22:5omega3 fractions in phospholipids;

- **lower C18:3 omega3, C20:5 omega3 and total (sigma)omega3 FAs,**

and higher C20:4omega6/C20:5omega3 and sigmaomega6/sigmaomega3 ratios in cholesteryl esters; lower serum concentrations of phospholipids and cholesteryl esters; and a decreased OPI.

In depression, there were

- **significant and positive correlations between serum Zn and C20:5 omega3 and C22:6 omega3 fractions in phospholipids;**
- **and significant inverse correlations between serum Zn and the sigma omega6/sigma omega3, C20:4 omega6/C20:5omega3, and C22:5omega6/C22:6omega3 ratios in phospholipids.**

There was no significant effect of antidepressive treatment on any of the FAs. The results show that, in major depression, there is a

deficiency of omega3 PUFAs and a compensatory increase in MUFAs and C22:5 omega6 in phospholipids. The results suggest that: (i) there is an abnormal metabolism of omega3 PUFAs in depression; (ii) the FA alterations in depression are related to the inflammatory response in that illness; and (iii) the disorders may persist despite successful antidepressant treatment.

Maes M et al. University Department of Psychiatry, Clinical Research Center for Mental Health, Antwerp, Belgium. m.maes@unicall.be Lowered omega3 polyunsaturated fatty acids in serum phospholipids and cholesteryl esters of depressed patients. Psychiatry Res, 1999 March; volume 85:3: pages 275-291.

TAURINE in Fish

Fish also a great source of the amino acid TAURINE

(only other food source with same large amount is animal brain tissue)

-like cysteine and methionine is a sulfur-containing amino acid. Is normally derived from cysteine.

-supplied totally by mother's breast milk during infancy (failure to thrive may be first sign in infants of taurine deficiency)

-taurine is never incorporated into body muscle protein

-taurine is extremely important in the brain

and other electrically excitable tissues (eye, heart, e.g.)

- Taurine acts as an anti-anxiety, sleep inducing agent.

-Taurine acts as an anti-convulsive agent by stabilizing electrically unstable nerve cells seen in epileptics. (= 3.5 to 7 grams a day)

-taurine may prevents strokes and reduce blood pressure.

-taurine may be extremely important in other brain injured patients.

-inhibitory CNS neurotransmitter

-may be better than CoQ10 for heart failure

(Japanese Circulation Journal, 1983 = 4 grams

a day of taurine reversed congestive heart failure in 19 of 24 patients.

---(taurine is the most important and abundant free amino acid in the heart, surpassing the combined quantity of all the other amino acids.

- part of bile salts and therefore digestion of foods
- epilepsy

WARNINGS ABOUT FISH

1) COLD WATER OILY FISH HIGHER IN EPA & DHA (warm water tropical fish and most fresh water fish much lower--exceptions include trout and crappie)

2) MORE OIL, MORE VITAMIN E NEEDED

(on high fatty fish diet need to take 200 IU natural vitamin E extra each day)

3) Rancid smell means too much fat oxidation. EAT FRESH FISH ONLY?

4a) MERCURY much higher in large, long-living FISH (TUNA,

SWORDFISH, SHARK, E.G.)

5) FISH ALLERGY (always listed in the top 10 allergenic foods). Lots of cross-reactivity = herring, bass, trout, flounder, mackerel, catfish, perch all share a common antigen with cod. Not so with tuna.

Hansen TK et al. Codfish allergy in [38] adults: IgE cross-reactivity among fish species. Annals of Allergy, Asthma, and Immunology, 1997; volume 78: pages 187-194.

6) Alaskan studies = Lots of omega 3 oils from fish, seal, whale, etc. resulting in a reduction in death from CHD but an increase in hemorrhagic strokes.

7) Large doses of fish oil may raise blood sugar, many doctors are reluctant to recommend it to diabetics (Moderate doses of fish oil do not raise blood-sugar levels (e.g., 600 mg TID for 48 weeks resulted in improvement of blood flow to feet + significant improvement in the signs and symptoms of diabetic neuropathy + significant reduction in albumin appearing in the urine, suggesting improvement of diabetic nephropathy (see Okuda et al. Diab Comp, 1996; volume 10: pages 280-287.)

8) Farmed fish are fed differently than in the wild. Artificial feedings often lead to changes in essential fatty acid content.

All for now.