What can essential fatty acids do for you?

By Nutritional Therapist Linda Lazarides

Biocare products like Omega Plex are 15% off to AfME members (see opposite page)

In the early 1990s Professor Peter Behan from the Glasgow-based Institute of Neurological Sciences carried out a double-blind trial on 63 patients with post-viral fatigue syndrome, to investigate the effects of administering four grams a day of the EFA supplement Efamol Marine, compared with an inert dummy product. After three months, 85 per cent of the patients on Efamol Marine reported feeling better, compared with only 17 per cent of the control patients[i].

But measuring the benefits of supplementation is not always straightforward, and in 1999 another three-month study carried out at the University of Sheffield found no significant clinical differences between M.E. patients on Efamol Marine compared with a dummy treatment[ii].

What are EFAs?

Essential fatty acids are molecules found in tiny amounts in oils. They come in two distinct 'families'. Nuts, sunflower seeds and sesame seeds are good sources of the omega-6 family, while soya beans, flax seeds and oily fish (sardines, salmon etc.) are good sources of the omega-3 family. These fatty acids are called 'essential' because the human body cannot make them. It is essential to obtain them from your diet. Your body then metabolises EFAs to make prostaglandins – hormone-like regulators of many body functions.

There are far larger amounts of EFAs in nuts and flax oil than you could possibly pack into a small capsule, so why give Efamol Marine rather than simple dietary advice? In fact, the special qualities of this product (and similar ones) lie not in supplying EFAs but in supplying partly metabolised EFAs known as EPA and GLA (see sidebar). Many people with M.E. seem to lack a vital enzyme called D-6-D which allows the body to use EFAs. Giving them a pre-metabolised product can partly bypass this enzyme. The resulting health benefits could help to prevent a whole range of symptoms. In Professor Behan's study the patients experienced reduced fatigue, muscle pain, dizziness and depression, and their concentration improved.

Energy and your mitochondria

Some researchers believe that EFAs can destroy viruses and that viruses accordingly target and destroy the D-6-D enzyme to protect themselves. But there is a simpler explanation for the lack of D-6-D in M.E./CFS, and this involves the role of the mineral magnesium.

Take a look at Figure 1 on the next page. There is a growing consensus among expert biochemists and cell biologists that the primary pathological process behind this illness is 'mitochondrial dysfunction'. Your mitochondria are the units within your cells which produce the energy needed for most body processes. The name which biochemists give to this energy is ATP, and the description given to processes which require energy is 'ATP-driven'.

Many nutrients cannot just passively diffuse from your intestines into your blood and cells. They use ATP-driven processes to push them across cell membranes. Magnesium in particular needs a big push from ATP to get it into your cells where it

Partly-metabolised EFA products

Gamma-linolenic acid (GLA) is a partly metabolised form of EFAs from the omega-6 family. It is found in the oils of evening primrose, blackcurrant and borage seeds.

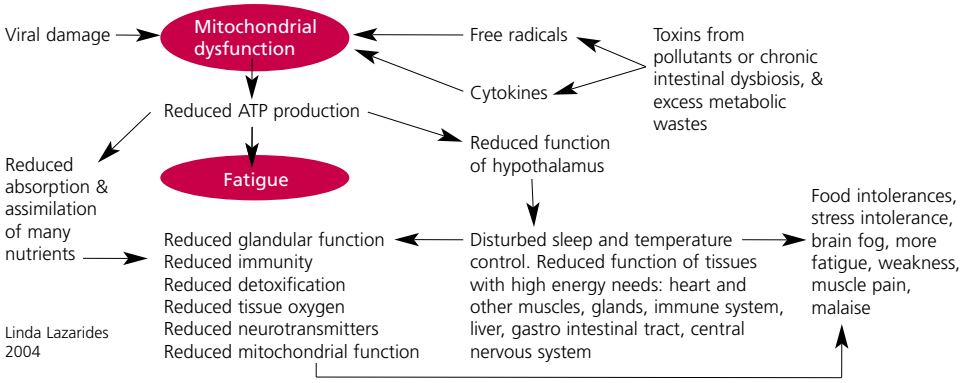
Eicosapentaenoic acid (EPA) is a partly metabolised form of EFAs from the omega-3 family, and is found in oil from the flesh (not the liver) of fish such as salmon, pilchards, sardines, herrings and mackerel.

GLA and EPA are found together in the combination products Efamol Marine, and in Biocare's Omegaplex (see page opposite – Ed).

Pharmaceutical-grade fish oil is available by mail order from the Nutri Centre, who offer a 25% discount to AfME members. Tel. 0207 436 5122 or visit www.nutricentre.com. Brand names include VegEPA (used by Dr Basant Puri and also incorporating virgin evening primrose oil – see www.vegepa.com), Eskimo 3 made by Nutri Ltd, and Arctic Omega. Overdosing with any supplement could unbalance your body chemistry, so always follow the manufacturer's directions and ideally supplement under expert supervision.

Prescriptions: If your local chemist stocks any of these products, you could try asking your GP for a prescription, but you may well get a refusal as local health authorities will make the GP pay if they do not believe the prescription is scientifically justified.

Figure 1



Glossary

ATP: Adenosine triphosphate, the name given to raw energy made by the mitochondria

D-6-D (Delta-6-Desaturase): The enzyme which metabolises EFAs in the body. This enzyme cannot work without sufficient magnesium, zinc and vitamin B6

Dysbiosis: Overgrowth of harmful bacteria or fungi (e.g. Candida) in the small intestine

Candidiasis: A type of fungal dysbiosis

Mitochondria: The part of the cell which makes ATP (energy)

Why do we need EFAs?

The primary role of EFAs is to be turned into prostaglandins which help to regulate our water balance, blood pressure, blood clotting and inflammatory processes. Symptoms of severe EFA deficiency include itchy dry skin and eyes, excessive thirst and skin rashes. Milder deficiencies may go unnoticed.

Testing for deficiencies

As low magnesium levels are common in M.E. and in turn cause poor EFA metabolism, essential fatty acid blood levels would probably also show up as low in many M.E. patients. For this reason tests are of limited value in my view. However, if patients did want to get nutritional status checks done privately, Biolab in London offer a blood-testing postal kit which you can take to your GP then return to them by special delivery the same day for analysis. A test for red blood cell magnesium costs £11 while the EFA panel is £48 and results must be sent to your doctor. To find out more, visit www.biolab.co.uk or tel. 020 7636 5959.

carries out its vital work, helping to make the electrical charges which operate your nerve cells, heart, brain and muscles. Without magnesium, the D-6-D enzyme cannot function. But according to nutritional testing experts, magnesium deficiency is common in patients with M.E./CFS[iii].

When you take partly-metabolised EFA supplements, you are conserving the nutrients normally required to metabolise EFAs. This is of major importance if you have a deficiency of any of these nutrients. Magnesium conservation alone could account for many benefits derived from taking partly-metabolised EFA supplements, in particular the reported reduction in muscle pain and tension; these are classic magnesium deficiency symptoms. Your mitochondria also use magnesium to make ATP, so by taking partly-metabolised EFAs you could theoretically gain more energy too.

Why not just take magnesium?

Logically, it would seem simpler just to take magnesium supplements to help make D-6-D, to metabolise your EFAs and support your mitochondria. The problem is, without the ability to make sufficient ATP you can still have a severe magnesium deficiency even if you take a supplement every day. Remember that reduced ATP levels mean a reduced ability to absorb and assimilate this nutrient. If you can only absorb 10%, for instance, of the magnesium you consume, you would need to take 3,000 mg magnesium per day to get the RDA of 300 mg. It is virtually impossible to get 3,000 mg magnesium a day from food. There is also a limit to how much you can take as oral supplements, since excessive magnesium causes diarrhoea and unbalances the absorption of other nutrients.

Research into M.E. nutrition and biochemistry is painfully scanty, but since the late 1990s a number of scientific papers have been pointing to a new discovery which suggests that EPA and GLA supplements could have a hitherto unrecognised therapeutic value in the treatment of M.E./CFS. This discovery is the role of cytokines.

Understanding cytokines

Cytokines are chemicals made by the white cells of the immune system. They are produced during inflammation, and elevated amounts of them have been found in some patients with M.E., and certain other chronic diseases, e.g. forms of arthritis. The long-term presence of excess cytokines is very damaging, and many scientific antennae are now tuned into cytokines as the factor which prevents mitochondria from repairing themselves[iv].

Major stimulants of excess cytokine production certainly include viruses and other infections, but once the infection has healed, cytokine production should cease. In M.E., arthritis and other chronic diseases for some reason it appears that it does not. Candidiasis and other forms of dysbiosis (bacterial overgrowth of the small intestine) are of course types of low-grade infection. These plus inflammatory changes encouraged by food intolerances, pollutants, dehydration etc. may be able to keep promoting cytokine production indefinitely.

Fish oil – leading the fight against cytokines

Cytokine promoters must be addressed by means of dietary changes, but researchers have also identified supplements with natural anti-inflammatory properties that can

fight cytokines. Fish oil is the most widely-researched product. Other cytokine-reducing supplements are bromelain, GLA, nettle extract and ginger extract[v]. If the vicious circle of cytokine production can be stopped, this may give the mitochondria the opportunity to repair themselves. There is now some new evidence to support this approach. In April 2004 Dr Basant Puri at Hammersmith Hospital published the results of a fish oil trial on M.E./CFS patients, and the results look very encouraging[vi].

If you are seriously ill with M.E., I have just one caution. Not all fish oils are the same. Barry Sears, author of *The Omega Rx Zone*, is an author whom I very much respect. *Crude fish oil and cod liver oil should be considered the sewer of the sea*, says Sears. *Anything that is water-insoluble, such as PCBs, DDT and organic mercury compounds, will be found in it*. He recommends only using products whose level of PCBs is guaranteed to be less than 10 parts per billion (ppb). And, he says, some products contain oils extracted from krill or tropical fish. These are relatively rich in arachidonic acid, which will undo the benefits of consuming the oil[vii].

Sears recommends only highly purified fish oil which he calls 'pharmaceutical grade'. His book contains some really interesting case reports, including a rapid reversal of an advanced case of Alzheimer's disease. Dr Basant Puri also confirms that since his recent trial was published, he has obtained even better clinical results using a pharmaceutical grade product against CFS[viii].

About the author

Linda Lazarides is a nutritional health expert and author of seven books. Her latest: *Treat Yourself with Nutritional Therapy* (ISBN 0953804631) has an informative section on M.E./CFS, plus over 100 recipes for meals to help reduce allergies and cytokines. To find out more, visit her website at www.health-diets.net.

If you decide to try taking pharmaceutical-grade fish oil, Linda would be very interested in a report from you on the results. Email her at linda@health-diets.net or write c/o AfME at Box No. 4041

InterAction medical advisor Dr Kelly Morris comments:

The theory presented is fascinating, although without good epidemiology research, I cannot share Linda Lazarides' certainty that immune activation, mitochondrial dysfunction, or EFA and magnesium deficiencies are common to many people with CFS/M.E. But as different lines of evidence converge, I am optimistic that these and other recurring themes represent final common pathways of the different triggers for chronic fatigue and related symptoms.

The pattern of dysfunction described here may be particularly relevant to people with an infectious or immunological trigger (e.g. vaccination), as these people are most likely to have chronic immune activation. This may explain the discrepancy in findings between studies, since Prof Behan's group studied people with post-viral fatigue whereas researchers at Sheffield studied CFS, which could lead to large differences between studies in the number of people with chronic immune activation. Also, Prof Behan's study found 85% of people had deficient EFAs while the Sheffield study did not find any difference between patients and healthy participants.

Together with the research by Dr Puri, these studies suggest that people with an infectious or immune trigger, particularly those with proven EFA deficiency, might benefit from a 3-month trial of supplements. The only prescribable UK preparations are Omocor and Maxepa, licensed for an indication other than EFA deficiency. Testing for red cell EFAs is not widely available though I would guess that a sympathetic doctor is likely to take more notice of a lab test indicating deficiency, especially when backed up by the reports of these three trials.

References:

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