

CFS and B12 - rationale for using vitamin B12 - Sarah Myhill

Over the last 22 years of treating over 3,000 patients with chronic fatigue syndrome, I have developed a programme of treatment which I believe all patients must do as the foundation before proceeding to other treatments. Vitamin B12 by injection I see as an integral part of this programme and it is effective for many, regardless of the cause of their chronic fatigue syndrome.

Those patients who respond to B12 are not obviously deficient in B12, indeed blood tests usually show normal levels. The "normal" levels of B12 have been set at those levels necessary to prevent pernicious anaemia - this may not be the same as those levels for optimal biochemical function. B12 has a great many other functions as well as the prevention of pernicious anaemia. However, what is interesting is how B12 is beneficial in so many patients with fatigue, regardless of the cause of their CFS, and suggests that there is a common mechanism of chronic fatigue which B12 is effective at alleviating.

General mechanism by which B12 relieves the symptoms of CFS

Professor Martin Pall has looked at the biochemical abnormalities in CFS and shown that sufferers have high levels of nitric oxide and its oxidant product peroxynitrite. These substances may be directly responsible for many of the symptoms of CFS and are released in response to stress, whether that is infectious stress, chemical stress or whatever. B12 is important because it is the most powerful scavenger of nitric oxide and will therefore reduce the symptoms of CFS regardless of the cause.(1, 2, 3, 4, 5, 6)

Nitric oxide is known to have a detrimental effect on brain function and pain sensitivity. Levels are greatly increased by exposure to chemicals such as organophosphates and organic solvents(7). When sensitive tests of B12 were applied (serum methylmalonic acid and homocysteine) before and after B12 therapy, the following symptoms were noted to be caused by subclinical B12 deficiency: parasthesia, ataxia, muscle weakness, hallucinations, personality and mood changes, fatigue, sore tongue and diarrhoea.(8)

B12 in fatigue syndromes

The "foggy brain" with difficulty thinking clearly, poor short term memory and multitasking are often much improved by B12.(9, 10, 11). Mood and personality changes, so often a feature of patients with chemical poisoning, can be improved by B12(12). The physical fatigue and well being are often both improved.

A study

Twenty eight subjects suffering from non-specific fatigue were evaluated in a double-blind crossover trial of 5 mg of hydroxocobalamin twice weekly for 2 weeks, followed by a 2-week rest period, and then a similar treatment with a matching placebo. The placebo group in the first 2 weeks had a favourable response to the hydroxocobalamin during the second 2 week period with respect to enhanced general well being. Subjects who received hydroxocobalamin in the first 2-week period showed no difference between responses to the active and placebo treatments, which suggests that the effect of vitamin B12 lasted for over 4 weeks. It is noted there was no direct correlation between serum vitamin B12 concentrations and improvement. Whatever the mechanism, the improvement after hydroxocobalamin may be sustained for 4 weeks after stopping the medication. "A Pilot Study of Vitamin B12 in the Treatment of Tiredness," Ellis, F.R., and Nasser, S., British Journal of Nutrition, 1973;30:277-283.

Practical Details

Vitamin B12 has no known toxicity and B12 surplus to requirement is simply passed out in the urine (which may discolour pink). It is theoretically possible to be allergic to B12 but in the thousands of injections that I have sanctioned this has only ever occurred after several injections and causes local itching, redness and swelling (although the commonest cause of redness and swelling is poor injection technique). It does not seem to matter whether hydroxocobalamin or

cyanocobalamin is used. I usually start with ½ mg daily by subcutaneous injection, then adjust the frequency according to response - some patients will respond straight away, some need several doses before they see improvement. I would do at least 10 injections before giving up. Many of my patients learn to inject themselves - this means they can be independent of their doctors.

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- (3) Pall ML, Satterlee JD. Elevated nitric oxide/peroxynitrite mechanism for the common etiology of multiple chemical sensitivity, chronic fatigue syndrome and posttraumatic stress disorder. *Annals of the New York Academy of Science* 2001;933:323-329.
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- (8) Neuropsychiatric disorders caused by cobalamin deficiency in the absence of anaemia or macrocytosis J Lindenbaum et al *New Engl J Med* 1988; 318: 1720-1728.
- (9) MacDonald Holmes J. Cerebral manifestations of vitamin B12 deficiency. *Br Med J* 1956; 2: 1394-1398.
- (10) Ellis FR, Nasser S. A pilot study of vitamin B12 in the treatment of tiredness. *Br J Nutr* 1973; 30: 277-283
- (11) Langdon FW. Nervous and mental manifestations of pre-pernicious anaemia. *J Amer Med Assoc* 1905; 45: 1635-1638
- (12) Strachan RW, Henderson JG. Psychiatric syndromes due to avitaminosis B12 with normal blood and marrow. *Quart J Med New Series* XXXIV 1965: 303-317

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