Highly Effective Treatments for Pain and Fatigue
by Jacob Teitelbaum, MD

Growth Hormone, Vasopressin and Prolactin

This month's column wraps up the section on hormonal dysfunctions in chronic fatigue syndrome and fibromyalgia. We have discussed the importance of treating an underactive thyroid and adrenal gland despite normal blood tests as well as treating estrogen, progesterone, and testosterone deficiencies. We will now review growth hormone, vasopressin, and prolactin.

Clinical experience has shown that some patients with diffuse hypothalamic or pituitary disease do not respond to treatment, even when their adrenal hormone, thyroid hormone, oxytocin, estrogen, and testosterone are replaced. Current research suggests that inadequate levels of growth hormone (GH) may be an important factor for these patients. GH is synthesized and stored in the pituitary gland and assists in protein synthesis in the body and bone growth in the limbs. It is also responsible for stimulating DHEA production. Excellent studies by Drs. Robert Bennett and Peter Behan, noted CFIDS/FMS researchers, show that people with fibromyalgia have significantly diminished GH levels. Other studies have shown that low GH levels can be associated with significant fatigue and CFIDS-like symptoms. GH is produced during the deep stages of sleep (stages 3 and 4) that are missing in CFIDS/FMS. Getting this deep, restorative sleep may well be the best way to raise GH. GH is critical for tissue repair, and FMS symptoms have been shown to improve with GH treatment. In the future, growth hormone may help those few CFIDS patients who do not improve with the current treatment approach. However, treatment with growth hormone is expensive, averaging around $12,000 per year. In addition, concerns have been raised about the possible increased risk of cancer associated with growth hormone injections. Fortunately, though, there may be cheaper and more physiologic ways to effectively increase growth hormone.

There are three main ways to stimulate growth hormone release:

1. Deep sleep. Large amounts of growth hormone are released during deep sleep, and the lack of deep sleep may be a major cause of growth hormone deficiency in fibromyalgia and chronic fatigue syndrome. This is one reason why it is important to aggressively treat these patients to be sure that they get at least 8-9 hours of sleep a night. Natural remedies such as The Revitalizing Sleep Formula (a mix of six herbs which is excellent) by Integrative Therapeutics, 5-HTP, calcium and magnesium at bedtime, and melatonin one half milligram, can be very effective for sleep. If prescriptions are needed, Ambien, Desyrel, and Klonopin are more helpful than other sleep medications. A more extensive list of natural and pharmacologic sleep aids with full directions for use can be seen at www.vitality101.com (click on “treatment protocol”).

2. Exercise. Exercise usually results in an approximately 800% increase in growth hormone levels. Unfortunately, this rise in growth hormone with exercise is blocked in fibromyalgia. The reasons for this are not known. Interestingly, adding the medication metinon (30-60 milligrams before exercise) restores the normal rise in growth hormone release during exercise in fibromyalgia. A study testing this therapy in fibromyalgia is being planned.

3. Sex. This is another wonderful way to raise growth hormone and is a lot more fun than getting a shot every day. A study done in Scotland showed that people who have sex at least 3 times a week looked 10 years younger than those who had sex less frequently. It was theorized that this was because of the increase in growth hormone.

Other things to consider are that growth hormone works by stimulating IGF-1 which stimulates DHEA. It is quite possible that many of the benefits of growth hormone can also be achieved by simply optimizing DHEA levels as discussed earlier. Taking arginine, which is the precursor for growth hormone, may also raise growth hormone levels. The problem with this is that it also stimulates nitric oxide production which may be elevated in CFS/fibromyalgia (this is work by Professor Martin Pall), and may also act as a growth factor for herpes viruses which may also be playing a role in CFS and fibromyalgia. It is for these reasons that I rarely use arginine in these patients.

Other hormone deficiencies are also important. People who are lightheaded or drink more water than normal – that is, most CFIDS/FMS patients – may be low in vasopressin. This can cause low blood pressure and secondary fatigue. Vasopressin, which is also known as the antidiuretic hormone (ADH), is secreted by the pituitary gland and keeps the body from losing too much water by increasing the amount that is reabsorbed by the kidneys. The simplest treatment for a low vasopressin level is to use plenty of salt and drink plenty of water. A small percentage of patients (usually those under 16 years of age) find that taking 0.1 milligram of fludrocortisone (Florinef), another adrenal-like hormone, along with potassium every day, can improve their symptoms. In adults, it was found to not be effective in a recent NIH study, which found it helped only 14% of CFIDS patients. Desmopressin, a synthetic derivative of vasopressin that is available as a nasal spray, is even less helpful. We’ve found other agents (fluoxetine [Prozac], sertraline [Zoloft], dextroamphetamine [Dexedrine], or ephedrine) to be much more effective than Florinef for people with neurally mediated hypotension and CFIDS.

Prolactin levels are sometimes also elevated in CFIDS patients. Prolactin is synthesized and stored in the pituitary gland, and is best known for stimulating milk production after childbirth. The hypothalamus suppresses, instead of stimulates, prolactin production. To make sure that no
(benign) pituitary tumor exists (usually pituitary adenomas) however, I may order a magnetic resonance imaging (MRI) scan in patients who still have elevated prolactin levels after four months of treatment. The MRI generally shows that everything is normal. Using our protocol, most patients have found that their elevated prolactin comes down to normal by the four-month follow-up visit.

Another interesting possibility was suggested by a recent study that showed that yeast infections release fungal cell wall glucan components into the circulation. The study showed that these components stimulated the pituitary cells and resulted in an approximately 60% increase in prolactin. Because of this, it is possible that the Candida overgrowth is also contributing to the elevated prolactin, and this may also explain part of the mechanism of the role of fungal infections in CFS/fibromyalgia (Breuel KP, et al. Anterior Pituitary Cells Express Pattern Recognition Receptors for Fungal Glucans: Applications for Neuroendocrine Immune Involvement in Response to Fungal Infections. Neuroimmunomodulation 2004;11:1-9).

Some physicians have also reported diabetes mellitus in the later stages of CFIDS, although I have not seen this problem in my patients. Dr. Jeffries, interestingly, has found that diabetes often improves through treatment with low-dose cortisol.

As you can see, many problems can occur when the body's glands do not function properly. The good news is that most of these problems can be treated. In my experience, this has often resulted in dramatic improvement. It is important, though, to treat the whole person, not simply the hormonal problem.

Let's briefly review the key points in the treatment of hormonal dysfunctions:

**Important Points**

- Underactive adrenals are common in CFIDS. Treat low or borderline adrenal function with low-dose Cortef, adrenal glandulars such as Adrenal Stress End and/or DHEA (adrenal hormones). If blood pressure is low, try Florinef, Prozac, Dexedrine, or ephedrine; increase salt and water intake.
- Hypothyroidism is also very common in CFIDS. Treat symptoms of low or borderline thyroid function with Armour Thyroid, or sustained-release T3— even if blood tests are normal.
- In women with an estrogen deficiency or a person of either sex with a testosterone deficiency, consider a trial replacement using the natural hormones.

In upcoming sections we will discuss the role of infections in CFS/fibromyalgia and will then review pain management. For those of you who are interested, we are holding a three-day workshop on pain management in Kona Hawaii February 4-6, 2005. See www.vitality101.com for more information.

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