Adrenal Gland Dysfunction (Part 2): Treatment

Adrenal-associated health disorders are far more prevalent than often recognized. Chronic Fatigue Syndrome and Fibromyalgia have their root causes due to adrenal gland dysfunction, and there are many other disorders in which adrenal gland dysfunction is a major component.

Continuing from part 1 of "Adrenal Gland Dysfunction: A Common Cause of Puzzling Health Problems" we will explore the treatment methods of each stage using a Functional Medicine approach. For those unfamiliar with adrenal disorders, reviewing and re-reading part 1 before reading this article is highly advisable.

Stages of Adrenal Dysfunction: A Review

As mentioned in part one of this article the first stage is arousal due to some type of immediate stress or acute emergency situation and is a healthy protective response. It is only when our body gets "stuck" in the stage of resistance that there is a problem.

The second stage, the stage of resistance, involves our body adapting to stress by changing the set point of activation of the sympathetic nervous system and secretion of cortisol by the adrenal glands. In other words our body (and brain) gets stuck in a response where everything is seen as an emergency situation. This second stage can persist for days, months or years depending on the individual and the severity or cumulative total of stressors in a given period of time, but it will almost always lead to the final stage of adrenal dysfunction. In this stage another key adrenal hormone called DHEA (Dehydroepiandrosterone) tends to become depleted. Thyroid gland function often starts to go awry during this stage of adrenal dysfunction.

In the final stage, the stage of exhaustion, this involves the depletion of the adrenal glands ability to make cortisol and other key hormones such as DHEA. This stage is also called "Adrenal Fatigue". This stage occurs with many people who have had a major stressor that their body never recovered from, or with multiple cumulative stressors eventually taking their toll on the person where the adrenal glands don't make enough cortisol or DHEA to adapt to everyday stressors. Common cumulative stressors are allergies, smoking or repeated exposure to second-hand cigarette smoke, lack of sleep, poor diet, lack of or excessive exercise, many prescription and nonprescription drugs, caffeine, dissatisfaction with work and relationships, and lack of relaxation. By the time adrenal fatigue sets in, often thyroid gland dysfunction progresses to hypothyroidism.

Many physicians seem to complete medical school with the impression that the only deficiency of cortisol is Addison's disease, which is near or total failure of cortisol secretion. Total failure of cortisol secretion can lead to death in a short time. However, adrenal fatigue is far more common than almost

total failure of the adrenals releasing cortisol. Similarly many physicians seem to only recognize the extreme elevation of cortisol as Cushing's syndrome, but in fact moderate long-term, moderate elevations of cortisol are far more common than Cushing's syndrome.

Emphasizing what was stated in part 1, determining which stage someone is in with a thorough history and salivary adrenal tests (1) prior to beginning treatment of adrenal disorders is absolutely critical because treatment is different for each person depending on what stage they are in! In this paper we will discuss treatment for stage 2 adrenal gland dysfunction.

Treatment for stage 2: Adrenal Gland Resistance

Simply put, the treatment goal is to reset the adrenal glands (more specifically the hypothalamic-pituitary-adrenal axis; abbreviated HPA) to lower the output of cortisol to more normal levels and bring DHEA to normal levels. A multifaceted approach, addressing various components is the most effective way to restore normal adrenal function. It can take anywhere from 6 to 18 months, depending on the state of adrenal dysfunction, to fully restore proper HPA function.

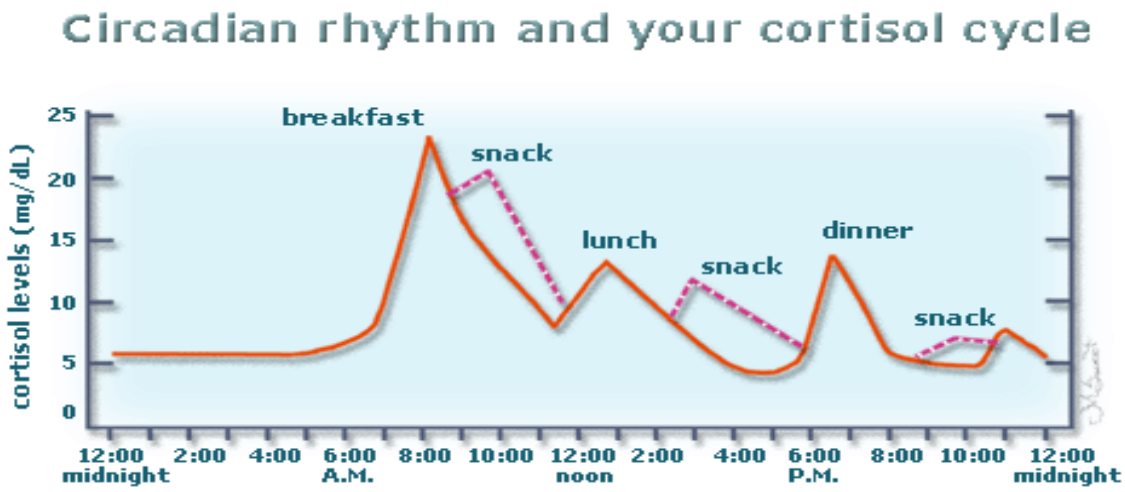
Control Blood Sugar:

Cortisol levels are greatly influenced by blood glucose levels. As blood glucose levels dip below 70 mg/dl, cortisol rises until blood glucose is stabilized. Between-meal snacks containing a combination of a concentrated protein with a low glycemic carbohydrate is a simple way to stabilize blood glucose levels. Lipoic acid in a dose of 200mg three times daily has shown to decrease the risk of diabetic neuropathy due to the blood glucose regulating effects (2). The herbs gymnema sylvestre, bitter melon, fenugreek, cinnamon and green tea are also helpful for glucose regulation...but many people having adrenal imbalances have been "labeled" with a previous diagnosis of Chronic Fatigue Syndrome (CFS) or Fibromyalgia and have been prescribed various medications for symptom relief. As a result of these various medications concurrent use of these herbs must be used with caution until they are weaned off some of these commonly prescribed medications. Increasing dietary fiber to 50 grams per day, partly by eating more beans or legumes daily greatly helps glucose balance. Engaging in moderate, non-competitive cardiovascular exercise for 25 to 30 minutes 4 to 5 days a week helps glucose regulation and is a valuable stress reducer.

Down Regulating Cortisol and the HPA Axis:

Those with higher levels of vitamin C (ascorbate) circulating in their blood tend to have lower cortisol levels (3). Since vitamin C is not stored in our body in any significant amount other than in the adrenal glands, a daily therapeutic dose of vitamin C can be helpful in controlling elevated cortisol. Ascorbate levels required to effect cortisol vary widely from person to person and levels of stress, but often a beneficial range is between 2000 to 8000 mg/day. Phosphatidylserine (PS) has shown to blunt the cortisol response to stressors and suppress an over stimulated HPA axis within 10 days in a dose of 800 mg/day (4). Beneficial effects have occurred with PS dosages as low as 200-400 mg/day (5). PS is a naturally occurring fatty substance found in all cell membranes, particularly brain cells. In this stage of adrenal gland overstimulation, using PS at night before bed is often (but not always) helpful for

improved sleep in those with CFS or Fibromyalgia. Some people however have improved sleep with PS taken early in the day. Moderate, non-competitive cardiovascular or resistance training exercise of less than 1 hour can be helpful, often needing to be limited to 25 to 30 minutes for 4-5 days each week so as not to elevate cortisol levels (6,7) or reduce the recuperative effects of sleep (8). Deep breathing is the fastest and easiest way to trigger your relaxation response, which engages the parasympathetic nervous system. Yoga, Qi gong and T'ai chi are such healthy practices in large part because they combine deep breathing and movement to support a steady central nervous response with down regulation of the HPA axis. Eating 5 or 6 small, frequent, healthy meals and snacks throughout the day, rather than 3 large meals each day, smoothes the fluctuations in cortisol levels as illustrated below:



(Adapted from: Wilson, J. 2001. *Adrenal Fatigue*: *The 21st Century Stress Syndrome*, p266. Petaluma, CA: Smart Publications)

Normalizing DHEA levels:

Using oral or sublingual pregnenolone and/or DHEA may be useful in hypercortisolism for supporting a normal HPA. Pregnenolone is made by the adrenal cortex. Pregnenolone is a precursor to all the major hormones made by the adrenal cortex. Pregnenolone would not be given in most cases of stage 2 HPA dysfunction because it could cause an elevation of cortisol. Pregnenolone may be helpful in stage 3 HPA dysfunction due to its effects on increasing cortisol, as will be discussed in treatment for stage 3. When cortisol levels are high as in stage 2 HPA dysfunction, DHEA levels are often normal or low. Oral DHEA may be given in dosages of 5-15 mg per day to support normal DHEA levels...but DHEA must be used with caution depending on the present prescription or non-prescription drugs someone is concurrently taking until they are weaned off these drugs. Many of the drugs prescribed for CFS and Fibromyalgia actually cause imbalances in DHEA, cortisol and many other hormones, though they provide temporary symptom relief.

Balancing the Bodies Stress Response:

Adaptogens are plant substances that support the body's ability to "adapt" ideally to its environment. These herbs have a bimodal function of action either by providing a stimulant effect or a sedative effect depending on the needs of the individual in a particular situation. The adaptogenic herbs Rhodiola (Rhodiola rosea), Asian ginseng (Panax ginseng), Siberian ginseng (Eleutherococcus senticosus), and Ashwagandha root (Withania somnifera), can be helpful in stage 2 adrenal gland dysfunction. Their function is to provide nutritional support to "tone down" the effect of the stress response on the body (9,10,11,12,13). However, many people who have been seeing their allopathic medical doctor for drug treatment of CFS or Fibromyalgia will require being weaned off of many of those drugs to prevent possible interactions. These adaptogens, used alone or together in combination, can be very effective, beneficial and safe, absent interference from drug therapy. Since research shows that an average of 106,000 Americans die every year from the side effects of properly prescribed medications (14) and a yearly average of 2.2 million Americans who are hospitalized have serious adverse drug reactions (15), using non-drug therapies are highly desirable.

Decrease Conversion of Adrenal Hormones to Estrogens:

With imbalances in cortisol and DHEA, the male and female sex hormones are thrown further out of balance. Body fat starts to easily accumulate as excess estrogen is produced, in both men and women. Body fat contains an enzyme that converts adrenal steroids to estrogen. A nutrient substance called Chrysin helps decrease the conversion of adrenal hormones and testosterone to estrogens (16), in males and females. Chrysin is a dietary flavenoid found in small amounts in honey, vegetables and fruits. For purposes of decreasing conversion of adrenal steroids to estrogens, a therapeutic dose range of 90 to 120 milligrams per day is advisable.

Decreasing Food and Environmental Allergies:

As detailed in the December 2007 issue of Functional Health Notes, gastrointestinal (GI) tract function is important for many seemingly unassociated health issues. This is the case for adrenal gland disorders. The continual stress on the body due to food and environmental allergies damaging the GI tract raises cortisol levels and is often associated with stage 2 adrenal dysfunction (17). Chronically elevated cortisol inducing food and environmental allergies also has effects on children (18). Even unborn babies of pregnant women who are chronically under stress have higher incidences of asthma, food and environmental allergies after birth (19). This fact is unfortunately often overlooked by many well intentioned allopathic doctors treating those with CFS or Fibromyalgia and pediatric patients. Effective measures to assist decreasing food and environmental allergies include the use of digestive and systemic enzymes, eliminating gluten-containing foods from the diet, or undergoing an allergy-elimination treatment regimen with the BioSET Allergy Elimination protocols. We have used either some or all of these methods in our practice with patients who've been in stage 2 adrenal dysfunction and by decreasing the chronic stress induced by food or environmental allergies many cases of those with CFS/Fibromyalgia have obtained significant improvement.

Increasing Cellular Energy Production: Ribose, Carnitine and CoQ10

Ribose is a sugar required in every cell of the human body. It is the fundamental part of the energy compound adenosine triphosphate (ATP). Healthy levels of ATP are necessary for energy to run the basic cellular functions in our heart, brain, muscles and other tissues. Ribose is also a component of the genetic material DNA and RNA. Ribose can be made naturally in the body but it is a slow process limited by enzymes lacking in heart and muscle cells. No foods contain ribose in any substantial amount. Stress from many chronic diseases drains the body's energy reserve of ribose and therefore supplemental ribose is necessary. There are at least 300 published research studies on ribose supporting healthy function with benefits in many particular health challenges, including Fibromyalgia and CFS (20). Recommended dosages vary from 5 to 15 grams ribose per day, with higher dosages required with greater stress and more advanced disease. Supplemental ribose does not raise blood sugar because it is a five-carbon sugar.

L- Carnitine is a substance made by the body for helping transport fatty acids into the cells "power plants", the mitochondria. Under stress the blood levels of L-carnitine decrease and there is insufficient fatty acid transport into the cells mitochondria for energy production. Additionally without adequate carnitine, triglyceride levels rise due to lipids not getting into the mitochondria to be burned as fuel. Supplemental L-carnitine in a doses as low as 1000 or 2000 mg per day has been verified beneficial for carrying out the functions of fatty acid transport into the mitochondria in numerous research studies, and therefore effective in many health challenges.

Coenzyme Q10 (CoQ10) is also named ubiquinol, because it is ubiquitous in the body…in other words all the cells in the body make it and require it for energy production. CoQ10 is essential for the mitochondria to produce energy. It is well established in literally all the research literature that cholesterol-lowering drugs drastically decrease CoQ10 in the cells to critically low levels. Since many patients with adrenal dysfunction (where they've been labeled as having fibromyalgia or CFS) have also been prescribed cholesterol lowering drugs, cellular energy production is lowered even more so and as a result, their condition is further exacerbated. Supplemental CoQ10, preferably in the ubiquinol form, in dosages of 50 to 200 mg per day can be very beneficial in many health challenges.

Decreasing Inflammation:

Lumbrokinase is a group of six proteolysis enzymes derived from the earthworm Lumbricus rubellus. Research shows lumbrokinase supports the body in breaking up and dissolving the unhealthy coagulation of blood, to support fibrinolytic activity (21, 22) thereby potentially bringing fibrinogen to healthy levels. Some of the predecessors of inflammation are unhealthy blood coagulation and increased fibrinogen. In many chronic disorders, including stage 2 adrenal gland dysfunction, fibrinogen is elevated to a high normal range and inflammation is an underlying process. Blood fibrinogen levels of 310 to 340, still within normal range, are commonly observed in those diagnosed with CFS and Fibromyalgia. However this is not an *optimal* range. Optimal fibrinogen ranges of 250 to 280 are what we make our goal for those coming to our clinic with various chronic disease conditions.

Modulating Structural/Neurological Influences on Cortisol Output:

Stress on the body from spinal joint, neural irritation and muscle pain have shown to be associated with increased cortisol levels. The characteristic muscle aches and pain seen in CFS/Fibromyalgia are well documented in research literature. The use of chiropractic manipulation and various manual muscle stretching and relaxation techniques for decreasing musculoskeletal pain due to nerve irritation is well established. According to various research studies, the specific benefits of chiropractic high-velocity, low-force adjustments in hyper-cortisol states include, but are not limited to the following:

1) Promoting relaxation of the muscles along the spine (23)
2) Temporary rise of blood beta-endorphins (24)
3) Temporarily enhancing the ability of the white blood cells and monocytes to kill bacteria (25)
4) Activation of the diffuse descending pain inhibitory system

Summary and Conclusions:

There is a plethora--a superabundance—of peer-reviewed research supporting a functional medicine approach to restoring the HPA axis function to normal, thereby resolving the associated disorders of CFS and Fibromyalgia. Though seemingly comprehensive to the reader without a background in health care, I have only touched the surface of this topic and potential modalities for restoring normal function to the HPA axis. In the final part of this article, I will discuss treatment of stage 3 adrenal dysfunction, namely adrenal exhaustion.

If you or someone you know have questions about adrenal gland dysfunction, fibromyalgia or chronic fatigue syndrome don't hesitate to call us at 650-593-4447. We are here to help.

We are always happy to welcome new patients to our clinic in San Carlos, California, for those who can make the trip from out of the local area. Click here to contact us by phone, fax or e-mail.

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