

Fibromyalgia & Chronic Fatigue Syndromes: Understanding the Foundations

“The most commonplace crime is often the most mysterious because it presents no new or special features from which deductions may be drawn.”

– Sherlock Holmes in *A Study in Scarlet*,
by Sir Arthur Conan Doyle

One of the most rewarding aspects of medicine is finding how all the pieces of a puzzle fit together, an analogy appropriate for syndromes like fibromyalgia and chronic fatigue. Syndromes are, by their definition, sets of signs and symptoms that have repeatedly been shown to present together. However, this also implies that there is no widely recognized pattern of pathology, as found in conditions which have been designated diseases. Hence patients receive a diagnosis for syndromes such as fibromyalgia or chronic fatigue after better understood conditions, called diseases, have been ruled out and no causation can be found.

This does not imply, however, that no solution is available. There have been volumes of studies on these topics since the conditions were formally defined twenty years ago, resulting in some very convincing theories as to the origins of these syndromes. In this way a physician can serve a patient, very much like a detective, and track the underlying etiologies to ultimately make safe and effective therapeutic recommendations. The goal should be finding underlying biochemical or immunologic imbalances rather than solely focusing on attempts to treat the end

result of these imbalances, which manifest as symptoms. Unfortunately, the latter is often the case – as patients with fibromyalgia syndrome are often prescribed anti-depressants, sleep-aids, anxiolytics, sedatives, non-steroidal anti-inflammatory drugs (NSAIDs), and muscle relaxants, with only lukewarm results in controlled clinical trials.

There is a large degree of overlap between fibromyalgia and chronic fatigue syndromes. Diagnostic criteria for both conditions include patients suffering from muscle pain, weakness, fatigue, sleep disturbance, and depression. This became the focal point for a group of researchers who compared the symptoms of 90 patients who had been diagnosed with fibromyalgia syndrome, chronic fatigue syndrome, or multiple chemical sensitivities. They found that only 70% of those diagnosed with fibromyalgia met the Centers for Disease Control (CDC) criteria for chronic fatigue syndrome. Distinguishing features are that patients with fibromyalgia syndrome have tenderness in at least 11 of 18 specific anatomic points, which correspond to muscles and tendons, while persons with chronic fatigue syndrome must complain of exhaustion. Researchers also found that both of these conditions would seem to be multi-factorial, possibly owing their onset to several different mechanisms occurring either individually in a patient or even having a cumulative impact that results in observable symptoms.

Understanding Fibromyalgia Syndrome

Fibromyalgia syndrome has been associated with serotonin deficiency, hypometabolism/hypothyroidism, toxicity, intestinal-nervous system abnormalities and mitochondrial dysfunction. Serotonin deficiency has been the focus of many studies and was the first proposed mechanism for the condition. Serotonin is an inhibitory neurotransmitter used by the central nervous system and, if not present at sufficient levels, the body could have heightened pain perception in response to normal stimuli.

However, several research findings have shown results that refute this theory. They include finding metabolites of serotonin at normal levels in fibromyalgia patients, and the therapeutic use of drugs which increase serotonin at strategic locations along neurons ultimately having only short-term improvements. By contrast, the hypothyroidism hypothesis, which is associated with low-functioning metabolism, has continued to show promising correlations with fibromyalgia syndrome. A significant body of literature has associated inadequate thyroid hormone regulation with two of the key features of this condition: chronic widespread pain and abnormal tenderness. Furthermore, the effective use of thyroid support or thyroid hormone has been shown so often that it is largely considered a key element to successful therapy.

Toxicity has been shown to be a possible factor in the origins of fibromyalgia syndrome. Adverse effects can come in the form of excitotoxins like aspartame and monosodium glutamate (MSG), which disrupt hormones and have neurotoxic effects, or excessive levels of exposure to problematic compounds like food additives, pesticides, and other non-natural chemicals. One study found that approximately half of fibromyalgia syndrome patients had experienced at least one episode of symptom ag-

Toxicity

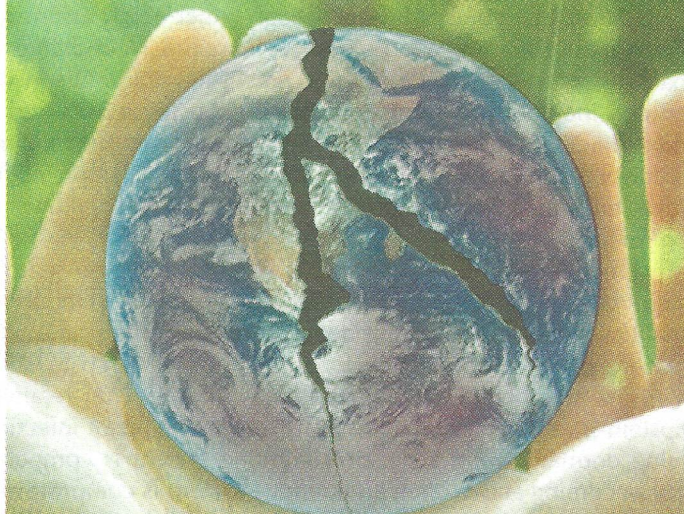
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gravation after some chemical exposure. Some studies have also shown correlations between fibromyalgia syndrome and irritable bowel syndrome (IBS), a condition in which patients suffer with abdominal pain, flatulence, and alternating diarrhea and constipation. Both sets of patients may exhibit symptoms like increased nerve sensitivity, headaches, fatigue, and sleep disturbances. This has led researchers to explore overlap in the causation of the dysfunctions, namely a chronic overstimulation of the autonomic nervous system which could have weakened the system and made it susceptible to a reduced threshold for pain.

Lastly, mitochondrial dysfunction is believed to be a major contributor to the etiology of fibromyalgia syndrome, with disruptions in such cellular functioning having been reported in some fibromyalgia patients. Mitochondria are small components of cells and are responsible for creating energy. They are present in high numbers in muscle cells where they create and utilize coenzyme Q10 as part of the energy production process. Coenzyme Q10 should be found in all cells of the body. 'Myalgia', or 'muscle pain', is a leading side effect of the cholesterol-lowering medications called 'statins', due to their ability to deplete coenzyme Q10 levels in the body. Small clinical trials have shown supplementation with coenzyme Q10 to both prevent and treat statin-induced myalgia, thereby pointing clinicians to a possible mechanism by which some of the key symptoms of fibromyalgia can be resolved, if the patient has a pertinent medication history. Furthermore, another class of popular medications, anti-depressants, have been shown to adversely affect coenzyme Q10 levels.

In light of these findings, it would seem prudent for fibromyalgia patients on these medications to have their coenzyme Q10 levels assessed. This can be done in a very non-invasive way by using a urine collection to measure organic acids. By collecting and measuring organic acids, patients get a snapshot into how their metabolic processes are functioning, including insight into cellular energy production, digestive function, neurotransmitter processing, and the functional need for vitamins and minerals. Elevations in some organic acids or low levels in others will point to depletions of vitamins or minerals in the body, thereby giving practitioners a way to infer how well a person's body is functioning and what biochemical pathways may not be functioning optimally. Organic acid testing is available on its own or as part of a more comprehensive blood and urine sample collection which analyzes amino acid levels to assess protein adequacy; assesses essential and metabolic fatty acids to mea-

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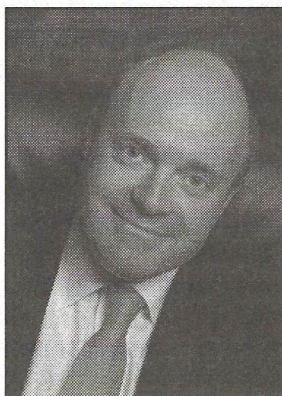
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Understanding Chronic Fatigue Syndrome

Chronic fatigue syndrome, though rather newly defined, is not a new disease at all. References for similar conditions go back as far as the 1860's in the medical literature. Diagnostic criteria include a new onset of fatigue causing a 50% reduction in activity for at least 6 months. Other symptoms include recurrent illnesses such as sore throats, painful lymph nodes, recurrent headaches, migratory joint pain, and cognitive impairment.

Underlying causes for chronic fatigue syndrome seem to stem largely from viruses, bacteria, immune system abnormalities or other underlying health problems. The prime virus researchers have implicated for this condition is Epstein-Barr Virus, a member of the herpes family. Like its viral relatives, Epstein-Barr Virus is able to establish a lifelong latent infection, lying dormant while a person's immune system is competent but becoming active once the immune system is compromised. Though research has been conflicted about how significant Epstein-Barr Virus is in all cases of chronic fatigue syndrome, it is clear that the virus itself has the ability to disrupt and compromise immunity, thereby leading to other illnesses. Other infectious organisms considered causative agents are Human herpes virus – 6, Cytomegalovirus, Enterovirus, Retrovirus, Brucella, *Borrelia burgdorferi* (Lyme disease) and *Giardia lamblia*. Regardless of what infectious agent may be responsible for the condition, there is little argument that an erratic immune system is of central importance in chronic fatigue syndrome. Though no one specific pattern has emerged from the different blood testing in this condition, the most consistent abnormality is a decreased number or activity of natural killer cells (NK cells), which are responsible for terminating human cells that have been infected by viruses or cancer. Other observed phenomena have seen elevations or depressions in different branches of the immune system, including the messenger cytokines.

Further causes of chronic fatigue syndrome have been shown to include pre-existing health conditions, prescription drugs, depression, impaired liver function, food allergies, hypothyroidism, and anemia, among others. Many chronic health conditions have widespread effects on the body and can disturb other organ systems, with far reaching repercussions, manifesting in ways such as chronic fatigue. These include chronic inflammatory conditions such as rheumatoid arthritis, heart disease, diabetes, cancer, liver disease, or multiple sclerosis. Prescription drugs implicated with this condition include blood pressure medications, anti-inflammatory agents, birth control pills, antihistamines, corticosteroids, and tranquilizers. Other underlying health problems could include depression, which is generally regarded as one of the major causes in the absence of a pre-existing condition, and is the first factor to address. Impaired liver function can be due to solvents, food additives, and toxins, and refers to a sluggish and congested performance of the liver to rid the body of undesirable substances. This does not

necessarily mean liver function tests would be thrown off and the liver would be inflamed; however, a person's symptomatic presentation could certainly spill over into our description of chronic fatigue syndrome. Food allergies could also be factors in this condition, by eliciting an immune response at different meals throughout the day which carries over and impairs a person's daily activity. Certainly hypothyroidism, with its systemic effects on lowering overall body performance, or anemia, which can diminish the body's iron stores and proper oxygenation of tissues, could cause chronic fatigue syndrome.

Alternative Medicine Interventions

A recent study from 2010 looked at seventy clinically controlled trials of alternative medicine interventions used for both fibromyalgia and chronic fatigue syndromes. Though methodological inconsistencies across studies made definitive conclusions difficult, the authors were able to find enough evidence to recommend further research on several specific treatments. These included magnesium, L-Carnitine, and physical medicine. Magnesium deficiency, best detected by measuring red blood cell levels of magnesium, could certainly result in symptoms of chronic fatigue as it is a nutrient very important for muscle function and health. This has certainly been shown to hold true in the professional literature where one study of thirty-two chronic fatigue syndrome patients received intramuscular injections of the mineral or a placebo and four out of five subjects receiving the magnesium had significantly improved energy levels and emotional health. Injections of magnesium are not required for results, as oral doses bound to citrate or aspartate are easily absorbed. L-Carnitine is an amino acid essential for transport of fatty acids into the mitochondrial matrix. In one study among chronic fatigue patients, L-Carnitine was compared with amantadine, a drug used to relieve fatigue in multiple sclerosis patients. The amino acid was overwhelmingly better tolerated and showed greater statistical improvement. Physical medicine was also shown to be quite successful, with trigger point therapy ameliorating pain in fibromyalgia patients and meditative practices showing some of the best efficacy for both groups of patients.

The best results for patients will come from an approach that seeks to address the underlying imbalances and restore proper functioning, using the least-invasive constituents of our body when possible. This perspective looks beyond simplified textbook definitions of disease and takes into account an individual's path, and road to recovery.

Dr. Shawn M. Carney is a naturopathic physician with Northeast Natural Medicine, LLC, an integrative naturopathic medicine clinic and therapeutic massage center for the whole family. He uses advanced diagnostic testing, detoxification and weight-management programs, personalized nutrition, botanicals, homeopathy, physical medicine and more while being in-network with most insurance companies. Northeast Natural Medicine, LLC is located 'at the flagpole' in Newtown and Dr. Carney can be reached at 1-800-723-2962 or www.northeastnatmed.com.