Case Study: 73 year old female with Generalized Body Pain

Patient was initially seen in January of 2006. She had been diagnosed five years prior with fibromyalgia by her rheumatologist after ruling out other rheumatologic and autoimmune diagnoses. At that time, she was prescribed duloxetine and gabapentin. Her pain was described as “constant” and “often intense”, limiting her daily activities. She has a history of poor sleep habits and constantly feeling unrefreshed in the morning. Otherwise, osteoporosis and depression were her only other comorbidities. Her daily intake of nutritional supplements included: 1000mg of strontium carbonate, 1200mg of calcium citrate, 400IU of vitamin D in divided doses. Upon physical examination, fifteen of the eighteen FMS points were positive upon 5kg of digital pressure. Sphygmomanometry-evoked allodynia (SEA) occurred at 140 mm Hg of pressure. Only mild hypertonicity was found throughout her upper trapezii and paraspinal musculature. SpectraCell testing revealed functional intracellular deficiencies of vitamin B6, vitamin D, magnesium, and coenzyme Q10. Her total antioxidant function measured 51.2%. Based upon these deficiencies, she was administered the following daily nutritional supplement protocol:

1) B-Complex weighted with extra B6 (250mg)
2) 500mg of magnesium glycinate
3) 1000IU of vitamin D3
4) 200mg of Coenzyme Q10

She was also instructed to consume one cup of pomegranate juice per day. Foods containing the deficient nutrients were advised to be consumed.

Follow up SpectraCell testing was performed six months later.

All deficiencies were resolved except for CoQ10. Her SPECTROX™ results increased to 68.1%. Sphygmomanometry-evoked allodynia (SEA) occurred at 170 mm Hg of pressure. Overall, her fibromyalgia symptoms were greatly improved. She was able to perform more of her activities without “suffering the consequences”. She still had some pain from the fibromyalgia, but this was only a “shadow” of the previous pain. In addition, she is waking up in the morning with more energy. Her rheumatologist has taken her off gabapentin and duloxetine. It was recommended to increase CoQ10 to 300mg per day and continue at a lower dose of the daily protocol until following up with another SpectraCell test in one year.

B6 and magnesium synergistically assist the conversion of tryptophan into serotonin (which, in turn, is converted into melatonin). As a result, improvements in sleep and mood resulted. Magnesium has been used as a treatment for FMS for many years. However, SpectraCell can differentiate those patients who will better respond, thereby saving everyone time, money, and pain. Magnesium is the body's 'calcium channel blocker' in the NMDA receptor, preventing the release of Substance P and various inflammatory cytokines. CoQ10 is the electron transporter than facilitates ATP production. Although in previous studies serum levels of CoQ10 (not intracellular levels) were found to be normal in FMS patients, one study demonstrated that many patients did improve when administered Coq10. Perhaps, intracellular studies would have clarified which patients were truly deficient and, therefore, would benefit for CoQ10 therapy. Vitamin D has entered as a potential key substance in evaluating fibromyalgic patients. Studies have shown that serum levels of 25-OH vitamin D correlate inversely with depression and pain of FMS. One of the symptoms of moderate Vitamin D deficiency is wide spread muscle pain. It is now commonly used in various autoimmune disorders. Being that Vitamin D is a potent antioxidant, this might have been responsible for part of the improvement in this patient's SPECTROX™ test.

Vitamin D deficiency is associated with anxiety and depression in fibromyalgia.

The epidemic of vitamin D deficiency.
J La State Med Soc. 2007 Jan-Feb;159(1):
NUTRITIONAL CONSIDERATIONS IN THE PAIN MANAGEMENT PRACTICE

VITAMIN D & musculoskeletal pain
Vitamin D deficiency often presents clinically as musculoskeletal pain. Correcting this deficiency can improve bone and muscle pain dramatically in patients with fibromyalgia and the painful bone disease osteomalacia.

COENZYME Q10 & migraines, myopathy
Supplementation with CoQ10 helps prevent migraine headaches, according to recent clinical trials. In addition, CoQ10 has been shown to relieve statin-induced myopathy by improving energy metabolism in muscle.

CARNITINE & myalgia, neuropathy
This important amino acid facilitates the transport of fatty acids into cell mitochondria so they can be effectively used for energy. Studies suggest that a deficiency of carnitine manifests clinically as myalgia, muscle weakness or neuropathy. In fact, supplementation with carnitine has been shown to improve pain associated with chemotherapy-induced neuropathy, diabetic neuropathy, HIV-induced neuropathy, chronic fatigue syndrome and fibromyalgia.

OLEIC ACID & chronic fatigue syndrome
A recent study showed significant correlations between the severity of chronic fatigue syndrome and levels of oleic acid, a monounsaturated fatty acid used by the body in energy storage.

MAGNESIUM & post operative pain
Magnesium alters pain processing by blocking NMDA receptors in the spinal cord. In several recent studies, administration of magnesium reduced consumption of pain killers post-operatively. The analgesic effect has been seen in cardiac, orthopedic, thoracic and gynecological surgery. Low magnesium levels also contribute to headaches and correlate strongly with the frequency of chest pain. Its antinociceptive effect is promising.

CHOLINE & acute pain
The activation of specific receptors by choline reduces acute inflammatory pain in mice, suggesting that administration of choline may help reduce the use of medication for inflammatory pain.

ALPHA LIPOIC ACID & diabetic neuropathy
Several clinical trials have documented the beneficial use of alpha-lipoic acid in the treatment of pain from diabetic polyneuropathy.

B VITAMINS & neuropathic pain
A recent study suggests clinical usefulness of vitamins B1, B6 and B12 in the treatment of neuropathic painful conditions following injury or inflammation. Vitamin B1 deficiency has been implicated in myopathy as well. Thiamin (vitamin B1) supplementation can also ease pain from shingles, migraine headaches and arthritis. Similarly, clinical indicators of pain associated with rheumatoid arthritis are inversely correlated with B6 levels. Riboflavin (vitamin B2) has also shown promise in reducing pain associated with inflammatory conditions and acts as a powerful agent in preventing migraine headaches. Since the B-complex vitamins work together, it is critical to assess the functional status of each one.

FOLIC ACID & migraines
A recent study showed that migraine headaches in children were significantly reduced when supplemented with folic acid. Magnesium supplementation has similar beneficial effects on the pain of pediatric migraine attacks.

COPPER & arthritis
Copper is necessary for the production of super oxide dismutase, which is a powerful anti-inflammatory enzyme. When administered to patients with rheumatoid arthritis, copper is effective in reducing inflammatory pain. Copper supplementation has also relieved patients of leg pain associated with sciatic neuritis.

ANTIOXIDANTS & inflammatory pain
The link between oxidative stress and inflammation has been well established. A patient in an inflammatory state will likely experience more pain. Studies have shown that reactive oxygen species are produced during persistent pain, indicating an increased need for antioxidants. Specifically, cysteine may have an inhibitory role in inflammatory pain due to its potent antioxidant effects on tissues. Similar results have been demonstrated with other antioxidants such as selenium, vitamin E, vitamin C, glutathione and coenzyme Q10. Recent studies show that intracellular inflammatory response in white blood cells play an important role in the pathophysiology of chronic fatigue syndrome. Combined antioxidant therapy also reduces pain in patients with chronic pancreatitis and fibromyalgia. Since many antioxidants work synergistically, measuring a single antioxidant may not provide an accurate picture of total antioxidant function in patients experiencing either chronic or acute pain. Spectracell’s SPECTROX™ will provide a complete picture of the patient’s overall antioxidant status.