



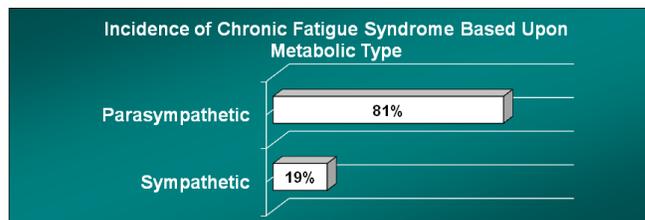
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## Chronic Fatigue Syndrome and Viral Agents

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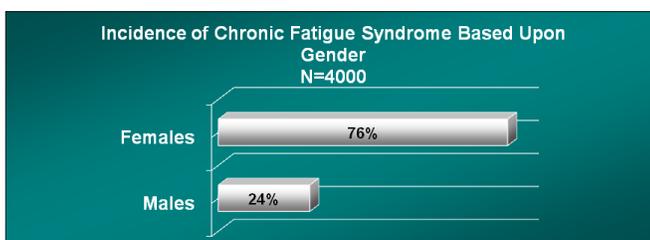
The debate about Chronic Fatigue Syndrome (CFS) being caused by a virus is again being discussed in the journals of JAMA, Lancet, and others. In 2009 it was speculated that a viral agent was responsible for CFS, but the findings became controversial when other studies were negative for a particular virus, the XMRV, or xenotropic murine leukemia virus being a causative agent.<sup>(1,2)</sup> Apparently the reason that other studies did not find the virus in affected individuals is that the XMRV virus can mutate, which is a characteristic of retrovirus infection. However, other researchers have since found the DNA of the XMRA virus in affected individuals. Therefore, the original research from 2009 is now actually supported.

Here at Trace Elements, over the years we have categorized individuals into metabolic categories and further, have established recognizable hair tissue mineral analysis (HTMA) patterns relative to specific health conditions. For instance, the following graphics reveal that over 80% of approximately 4000 individuals whose HTMA samples were submitted to TEI and identified as having CFS were found to be parasympathetic types. It was also found that over 75% of the affected individuals diagnosed with CFS are females.



These HTMA metabolic characteristics confirm a number of findings in the population suffering from CFS. It is estimated by other researchers that about 60 to 85% of all cases occur in women. CFS may also be linked to any number of viruses other than the XMRA, since the CFS symptoms often follow a viral episode such as the flu or mono and is frequently called the post viral fatigue syndrome (PVFS). Symptoms can range from chronic unrelenting fatigue with associated symptoms including depression, and sleep disorders, to muscle and joint pain with an increased cellular immune activation. Since excess tissue calcium is known to activate dormant viruses, and virus infection increases tissue calcium

retention, it is not unusual for patients with CFS to have high tissue calcium along with elevated calcium-to-phosphorus and calcium-to-magnesium ratios. Since calcium is a sedative mineral the overall metabolic pattern would also predispose patients toward adrenal and thyroid insufficiency, which also happens to contribute to chronic fatigue. Interestingly, we also find that individuals with fibromyalgia have very similar metabolic and HTMA mineral pattern characteristics<sup>(3,4)</sup> Often CFS patients will develop fibromyalgia and their HTMA patterns also reveal elevated calcium levels.



Abnormalities in the calcium-to-magnesium ratio affects muscular physiology, contributing to increased muscular tension and painful trigger points.

#### **- Conclusion –**

The HTMA patterns confirm not only the metabolic characteristics that have been associated with CFS, but also that these characteristics can predispose an individual to developing CFS. For example, we have long classified the parasympathetic type as having a dominant cellular immune response, which can be further stimulated by viral infections. This leads to neuroendocrine changes, thus affecting nutritional balance and ultimately slowing of the metabolic rate. The HTMA pattern provides a specific roadmap to an effective therapeutic regimen and ultimately a return to normal function in individuals affected by CFS, as well as related conditions, such as fibromyalgia.

For further information, please see TEI's website at [www.traceelements.com](http://www.traceelements.com). Click on Educational Resources, TEI Newsletter. See, [Fibromyalgia a Metabolic Profile, 2004](#). [The Immune System and Hair Tissue Mineral Patterns, 1994](#). and lastly, [Calcium and Virus Activation, 1989](#).

1. Kuehn, B. Study Reignites Debate About Viral Agent in Patients with Chronic Fatigue Syndrome. JAMA, 304,15, 2010.
2. Chronic Fatigue Syndrome: Going Viral. Lancet, 376,9745. 2010.
3. Ng, S. Hair Calcium and magnesium levels in patients with fibromyalgia: a case center study. J.Manipul.Physiol.Ther. 22,9, 1999.
4. Magaldi, M, et al. Changes in intracellular calcium and magnesium ions in the physiopathology of the fibromyalgia syndrome. Minerva Med. 91,7-8, 2010.

