Disease Severity Markers?

By Kristin Thorson, Editor, Fibromyalgia Network

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Wouldn't it be wonderful if doctors could order a blood test to see how well a therapy is doing, or document that a drug is not working? In the July 2011 issue of the Fibromyalgia Network Journal, several blood markers were identified for fibromyalgia, and the results are being refined in hopes that they will produce a diagnostic blood test for fibro. Team leader, Alan Light, Ph.D., of the University of Utah, suspects he will be able to identify many subgroups of fibromyalgia and chronic fatigue syndrome patients based on his vast array of more than a dozen types of markers.

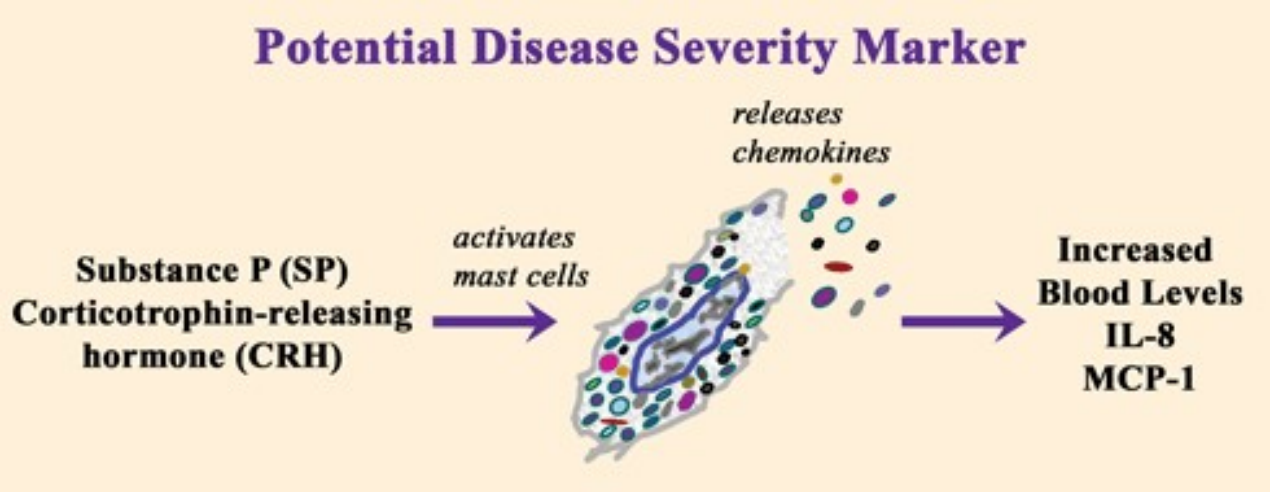
The work by Light is absolutely exciting and represents one of the greatest achievements so far in fibro research. But in the meantime, Dennis Ang, M.D., and his team at Indiana University, is looking at the potential for a quick, rather simple lab test for objectively measuring disease severity, in particular, the pain levels in people with fibromyalgia.*

Part of the difficulty with developing blood markers for fibro is that most of the action is occurring within the nervous system and the blood often does not usually reflect these changes. So Ang is looking for surrogate markers in the blood that might tell doctors how the central nervous system is working in people with fibromyalgia.

Plenty of research evidence shows that painful inputs from all over your body and multiple muscles places your central nervous system on high alert. This bombardment of inputs leads to a system where the concentration of pain transmitting chemicals builds up, such as substance P (SP) and corticotrophin-releasing hormone (CRH). In fact, both SP and CRH are elevated in the spinal fluid of people with fibromyalgia. As a result, the nervous system becomes sensitized to future painful inputs. Instead of toning down the pain signals, the nervous system magnifies them (e.g., making you feel worse, not better).

So why don't researchers and treating physicians just order a blood test to measure your levels of SP and CRH? While these chemicals are at least double what they should be in the spinal fluid of people with fibromyalgia, their values in the blood are normal. This is the hurdle that researchers have been stumbling over because many factors are clearly abnormal in the nervous system in people with fibro. Yet, spinal fluid measurements are only done in research studies and such techniques are simply not available for treating physicians.

Ang's team is testing a method to take a peek at what is happening inside the nervous system by testing two substances in the blood that may be caused by elevations in SP and CRH (both elevated in fibromyalgia). A simple diagram of how this new test might work is shown below. Basically, elevated SP and CRH causes an activation of mast cells that are located all over your body, leading to enhanced release into the blood of two immune system chemicals or chemokines: IL-8 and MCP-1



Exactly what IL-8 and MCP-1 do in the body is not nearly as important as just knowing that previous research has shown them to be elevated in the blood of fibromyalgia patients. If these two substances correspond to how well you are doing, then their concentration should decrease with improvements in pain ratings. On the other hand, if pain scores get worse, then their levels ought to increase. At least, this is how markers for measuring your disease severity should work.

One way to check if these two markers are able to pick up changes in fibro pain is to measure them before and after a treatment trial (i.e., the longitudinal measurement of treatment effects over time). Ang put a small group of fibro patients through a six-week course in pain and stress management while not changing any medications used. In fact, any medication changes could likely interfere with the measurement of the markers, so it was best to use a nondrug treatment approach.

Improvements in fibro pain corresponded to reductions in both IL-8 and MCP-1. The results are only preliminary, but offer hope that objective disease severity markers can be developed for fibromyalgia.

"While our study does not implicate a cause-and-effect relationship, the longitudinal associations of fibromyalgia pain severity with blood concentration of IL-8 and MCP-1 raise the question that these two chemokines may be involved in the pathogenesis of fibromyalgia," writes Ang. "If our findings are replicated in a larger group of patients, IL-8 and MCP-1 may facilitate the prediction of prognosis and monitoring of treatment response in the future."