In the first part of this series on the physical elements of stress, we covered the concept of accumulated stress load (allostatic load) and how it can wear down multiple body systems. In this installment let’s take a look at the ways stress can harm the immune system and impede the body’s ability to heal.

Most of us know that the immune system is responsible for fending off illness and overcoming sickness and injury—but not many are aware of the complex processes that come into play and the impact that even subtle disruptions can produce.

Research shows that stress can significantly disrupt the immune system, making it harder to fight illness, increasing symptom severity when we are ill and even impeding our ability to heal wounds. Stress and immune function are linked in substantial ways. But why?

First you have to understand some basics of the body’s immune system—a tightly orchestrated combination of specialized organs and cells that protect us from outside biological influences.

The most important function of the human immune system occurs at the cellular level of the blood and tissues. The lymphatic and blood circulation systems are paths for specialized white blood cells—like B cells, T cells, natural killer cells and macrophages—to travel around the body. Each of these white blood cells has a different responsibility, but all function together to recognize, attack and destroy bacteria, viruses, cancer cells and other threats.

These cellular components of the immune system communicate with one another by exchanging chemical messengers called cytokines.

Cytokines include a diverse assortment of interleukins, interferons, and growth factors. Some cytokines are chemical switches that turn certain immune cell types on and off. Other cytokines are released by cells at a site of injury or infection and call other immune cells to the region to help repair the damage or fight off the invader. The resulting inflammation from these “proinflammatory” cytokines often contributes to the symptoms we can see and feel. They not only aid the healing process, but can also bring on the achy, swollen and sluggish feelings often associated with illness and injury—a side effect of the chemical battle taking place.

Studies show that these cytokines are affected by stress levels and that stress, the immune system and even CFS may be connected, in part, by this dynamic.

For example, in a 1999 study—where subjects’ stress levels were measured prior to being infected with an influenza virus—researchers found that people reporting more stress had both a higher incidence and a greater severity of illness. The study tracked increased production of a particular proinflammatory cytokine (called interleukin-6) to the increase in illness in the stressed individuals. Not only did the symptom and cytokine spike seem to correspond, but increased cytokine levels persisted longer in people with higher stress scores.

In other research, Dr. Ronald Glaser and his wife, Dr. Janice Kiecolt-Glaser, of Ohio State University have demonstrated that elevated stress from situations ranging from academic exams to marital conflict can negatively affect wound healing. In a variety of studies over the years, their work has shown that wounds can take up to 60 percent longer to heal in people with increased stress levels. This is, in part, due to an
increase in interleukin-6, which is also associated with a spectrum of age-related conditions including cardiovascular disease, osteoporosis, type 2 diabetes, frailty and functional decline.

What implications does this have for people with CFS—some of whom exhibit higher than normal levels of multiple cytokines as well as lower production of glucocorticoids, the chemical agent meant to contain proinflammatory cytokine activity?

Dr. Charles Raison, of Emory University School of Medicine, believes that everyone—and CFS patients in particular—should move beyond old ideas about emotional states and physical states being unconnected. He urges, “We would do well to abandon old mind-body dichotomies, given the overwhelming evidence that psychological stress activates inflammation.”

He points to stress and inflammation levels as two things CFS patients should actively manage (see right).

And the cytokines themselves may add to problems people with CFS know all to well since—as they wage their battles meant to fight illness and infection—they are known to produce fatigue, muscle pain, fever, sleep disturbances and slowed cognition.

Though there is much more to the complicated workings of the immune system, it’s clear that stress impacts the process in a concrete and negative way, in part through it’s affect at the chemical, cellular level. Managing stress, as well as treating inflammation, may in fact become a biologic imperative.

MANAGING STRESS AND INFLAMMATION

Here are some basic practices you can follow to reduce the impact of stress on your immune system and to inhibit inflammation.

**Shift the balance of fatty acids in your diet**

Certain fatty acids in foods are less easily converted into the chemical components that aid inflammation. Omega-3 fatty acids (from fish and certain plants) help prevent inflammation while omega-6 fatty acids (from meat and dairy) bolster inflammatory responses. Switching from peanut and vegetable oils to canola and soybean oils, and eating more fish like tuna, mackerel, trout and salmon increases your omega-3 levels. Eating fewer beef and dairy products and giving preference to grass-fed animals rather than corn-fed ones can favorably reduce your levels of omega-6.

**Increase your intake of antioxidants and natural anti-inflammatories**

Oxidative stress can trigger the production of proinflammatory cytokines like interleukin-6. Antioxidants from green and black teas, oolong tea, garlic and fresh fruits may help. Vitamin D and the supplement tumeric have also been shown to have anti-inflammatory properties. But, of course, use of supplements and vitamins should be monitored closely for adverse reactions.

**Bring laughter into your life**

Sometimes laughter really is the best medicine. At the biophysical level, laughter moves lymph fluids through your body, helping your immune system clear toxins. Laughter also oxygenates the blood and increases circulation. Biochemically, it releases a host of healing agents. So consider embracing opportunities for laughter and bringing humor into your environment.

Other methods for boosting your immune system and reducing inflammation include adequate sleep, daily stretching and gentle movement and drinking plenty of clear fluids. Recent studies have also shown objective immune-enhancing effects from relaxation massage.

In the next issue!

Stress is more than an emotional catalyst. It triggers physical responses that can affect our health. The fall issue of the *CFIDS Chronicle* will examine some differences between acute and chronic stress and the effects each has on the body.