

Contemplating Cytokines

By Keith Eric Grant, PhD, NCTMB

The world ages us too fast. We grow up too quickly, we stop dreaming too early, and we develop the ability to worry at far too young an age.

- *Doug Wecker*

There's nothing like a bit of personal involvement to motivate learning.

With a disposition to burning the candle at both ends, a semi-addiction to exercise, and a tendency toward upper-respiratory allergies, I'm all too prone to catching a head cold from a school-bound offspring or world-traveling colleague. Generally, it's not the respiratory symptoms that impact me most, but the mental fog, tendency to nod off, and general malaise that comes with them. It's the immune system chemicals called cytokines, believed to result in the systemic response, that are the focus of this article. What's particularly fascinating about cytokines is that they show up in the literature on infections, allergies, exercise, stress responses, fibromyalgia, and chronic fatigue syndrome.

The local response to infection or tissue injury involves the production of cytokines, which are released at the site of inflammation. Cytokines facilitate an influx of lymphocytes, neutrophils, monocytes and other cells, which participate in the clearing of antigens and healing of tissue. The local inflammatory response is accompanied by a systemic response, known as the acute phase response.⁶

Similar to explicit tissue injury, strenuous exercise is also accompanied by an increase in circulating proinflammatory and inflammation-responsive cytokines.⁷ This effect is observed both from long events, such as marathons, and from shorter, intense episodes of eccentric exercise. The cytokine response following exercise is also affected by nutritional factors such as carbohydrate loading or restriction.⁶

Cytokines are potent mediators of immune activity. These chemicals carry messages from one cell group to another and invoke the most powerful of whole-body defense responses. The cytokines include the interferons and interleukins, which cause many of the symptoms of bacterial and viral infections - fever, headache, generalized aching, fatigue, weakness, and clouded consciousness.³ Injection of proinflammatory cytokines has reproduced many of these acute phase symptoms.

Cytokine production also responds to stress. It is now well established that the central nervous, endocrine and immune systems interact with each other; psychological stress can down-regulate the immune response by affecting the interplay of these systems. The interactions are complex, involving both the hypothalamic-pituitary-adrenal axis (HPA) and the autonomic nervous system.⁴

It's been proposed that cytokines, reacting to partial protein production by latent viral infections, could be a mechanism involved in chronic fatigue syndrome.⁴ The viruses could be partially reactivated; that is, viral proteins could be produced at levels high enough to cause a low-grade infection, but too low to be seen using current laboratory assays.⁵ Stress is also thought to play a role in viral reactivation.

Cytokines may also play an important role in the more systemic effects of allergic rhinitis, symptoms that include fatigue and difficulty concentrating. One possibility is that allergy stimulates the release of cytokines, which have been shown to produce achiness and fatigue, as well as cognitive impairment. It may also interfere with adrenergic and cholinergic activity in the central nervous system, thereby impairing attention.¹

In my December 2002 article, "Flushing Out Myths" (www.massagetoday.com/archives/2002/12/08.html) I advanced the opinion that post-massage reactions similar to flu might be due to an induced response of normally subclinical fibromyalgia; a concept advanced by Leon Chaitow.² I noted: "I tend to think of a body's neurochemical system on the edge of its ability to adapt being pushed temporarily beyond the edge by accommodating to the work being done. This reaction may be exacerbated by effects of athletic overtraining or by a genetic metabolic predisposition." The post-massage production of proinflammatory cytokines would be a possible mechanism leading to this result. Chaitow has also noted the involvement of cytokines in fibromyalgia.

The possibility of inducing a proinflammatory response should caution us not to probe too deeply, too fast into the unknown client. It is better to start a first session moderately and then adjust based on following up the client's response. On the other hand, since the immune response is impacted by stress, reducing

perceived stress and its effects within the musculature may help the client's body to cope with the otherwise unmanageable. Sometimes our lesser effort is more. It's all in the intention and the attention we bring.

References

1. Begany, Timothy. Allergic rhinitis may impair cognition. *Respiratory Reviews* 2000;5(7).
www.respiratoryreviews.com/jul00/rr_jul00_SARcognition.html.
2. Chaitow, Leon. *Fibromyalgia Syndrome - A Practitioner's Guide to Treatment*, Churchill Livingstone, ISBN0-443-06227-7.
3. Gislason, Stephen J. *Immune Mediators: Chemical Communication in Immune Networks*
www.nutramed.com/immunology/mediators.htm.
4. Glaser R, Kiecolt-Glaser JK. Stress-associated immune modulation: Relevance to viral infections and chronic fatigue syndrome. *American Journal of Medicine* 1998;105(3A):35s-42s,
<http://pni.psychiatry.ohio-state.edu/jkg/pdf/117.pdf>.
5. Holland, Earle. New hypothesis proposed for cause of chronic fatigue syndrome. *Ohio State University Research News*.1998; www.acs.ohio-state.edu/units/research/archive/cfs.htm.
6. Ostrowski, Kenneth, Thomas Rohde, Sven Asp, Peter Schjerling, and Bente Klarlund Pedersen. Pro- and anti-inflammatory cytokine balance in strenuous exercise in humans. *The Journal of Physiology* 1999;515(1):287-291. <http://jp.physoc.org/cgi/content/abstract/515/1/287>.
7. Pedersen, Bente Klarlund, Kenneth Ostrowski, Thomas Rohde, and Helle Bruunsgaard. The cytokine response to strenuous exercise. *Canadian Journal of Physiology and Pharmacology* 1998;76(5):505-511.

Editor's note: Due to the transient nature of the Internet, some links may not be operational.

Click [here](#) for more information about Keith Eric Grant, PhD, NCTMB.



Page printed from:

http://www.massagetoday.com/archives/2004/06/08.html?no_b=true