

Does Overweight and Always Hungry Mean the Brain Is Inflamed?

By David Seaman, DC, MS, DABCN

If you have followed my articles over the years, you know that I focus on inflammation reduction. This is not because I am fixated on inflammation due to a personal obsession, but rather because the subjection of inflammation demands our attention. That said, at first glance, the notion that the brain can be inflamed may appear silly. This is because we typically view inflammation in the context of swelling after an injury. However, the contemporary view of inflammation is that it reflects a manner of cellular communication and need not involve any of the classic signs of inflammation, such as redness, swelling, heat and pain. In fact, one can be systemically inflamed and have no symptoms at all.

The Consequences of Inflammation

For example, type 2 diabetes is caused by chronic inflammation, and its development is without the signs and symptoms classically associated with "inflammation." Consider the following statement by a researcher in this area: "Unequivocal experimental, epidemiological and clinical evidence produced during the past decade causally links inflammation, or the molecules and networks integral to inflammatory responses, to the development of these metabolic diseases and/or the complications that emerge from these pathologies, particularly in the context of obesity and type 2 diabetes."¹

Table 1 lists the predictors for the presence of metabolic syndrome X, which exists before a patient is obese or has type 2 diabetes. If a patient has three of these predictors, they have the metabolic syndrome and are inflamed.

Table 1: Diagnostic Predictors for Insulin Re-sistance Metabolic Syndrome X²	
Predictor	Abnormal Value
Blood sugar	> 100 mg/dL
Triglycerides	> 150 mg/dL
HDL cholesterol	< 50 for women; < 40 for men
Blood pressure	> 130/85 mmHg
Waist circumference	> 36 inches for women; >= 40 inches for men

The reason for our detour into the metabolic syndrome, obesity and diabetes is because the cytokine-mediated inflammatory state that causes these conditions^{1,3-4} is also what leads to hypothalamic inflammation.⁵ Indeed, a high-calorie, fat-rich diet causes cytokines to be expressed in the hypothalamus, contributing to the activation of intracellular inflammatory signal transduction. The outcome is insulin resistance within the hypothalamus and a reduction in satiety signaling, leading to overeating and weight gain.⁵ In other words, the brain of an overeater is inflamed.

Dietary and Supplemental Deflaming of the Brain

The reduction of systemic inflammation can begin at the next meal. A diet rich in vegetables, fruit and lean meat reduces systemic inflammation.⁴ Additional calories can come from nuts and seeds, particularly chia and hemp. Grains, legumes and dairy should be consumed in modest amounts. Foods that should be avoided included refined sugar, flour and oils, as they are all highly inflammatory and yet, at this point they represent approximately 60 percent of the calories consumed by Americans.⁶

Supplements that help to reduce the inflammatory state include a multivitamin, magnesium, omega-3 fish oils, and vitamin D.⁷⁻¹⁰ Supplements that can specifically help improve insulin sensitivity and help reduce inflammation include chromium and lipoic acid.¹¹⁻¹²

While the notion of brain inflammation might be new, the approach to reduce systemic inflammation is quite straightforward. Operationally, many patients only need to lose 5 percent to 20 percent of body weight to reduce or eliminate the metabolic syndrome,¹³ which means that reducing systemic and brain inflammation can be realized by all of your patients.

References

1. Hotamisligil GS. Inflammation and metabolic disorders. *Nature*, 2006;444:860-67.
 2. American Heart Association. Description of the metabolic syndrome. www.americanheart.org/presenter.jhtml?identifier=4756
 3. Grimble RF. Inflammatory status and insulin resistance. *Curr Opin Clin Nutr Metab Care*, 2003;5:551-59.
 4. O'Keefe JH, Gheewala NM, O'Keefe JO. Dietary strategies for improving post-prandial glucose, lipids, inflammation, and cardiovascular health. *J Am Coll Cardiol*, 2008;51:249-55.
 5. Velloso LA, Araujo EP, de Souza CT. Diet-induced inflammation of the hypothalamus in obesity. *Neuroimmunomodulation*, 2008;15:189-93.
 6. Cordain L, Eaton SB, Sebastian A, et al. Origins and evolution of the Western diet: health implications for the 21st century. *Am J Clin Nutr*, 2005;81:341-54.
 7. Church TS, Earnest CP, Wood KA, Kampert JB. Reduction of C-reactive protein levels through use of a multivitamin. *Am J Med*, 2003;115:702-707.
 8. King DE, Mainous AG, Geesey ME, Egan BM, Rehman S. Magnesium supplement intake and C-reactive protein levels in adults. *Nutr Res*, 2006;26:193-96.
 9. Simopoulos AP. The importance of the omega-6/omega-3 fatty acid ratio in cardiovascular disease and other chronic diseases. *Exp Biol Med*, 2008;233:674-88.
 10. Holick MF, Chen TC. Vitamin D deficiency: a worldwide problem with health consequences. *Am J Clin Nutr*, 2008;87(suppl):1080S-86S.
 11. Cefalu WT, Rood J Patricia Pinsonat P, et al. Characterization of the metabolic and physiologic response to chromium supplementation in subjects with type 2 diabetes mellitus. *Metab Clin Exper*, 2010;59:755-62.
 12. Shay KP, Moreau RF, Smith EJ, Smith AR, Hagen TM. Alpha-lipoic acid as a dietary supplement: molecular mechanisms and therapeutic potential. *Biochim Biophys Acta*, 2009;1790:1149-60.
 13. Tzotzas T, Evangelou P, Kiortsis DN. Obesity, weight loss and conditional cardiovascular risk factors. *Obesity Rev*, Nov. 3, 2010. [Epub ahead of print]
-

Click [here](#) for more information about David Seaman, DC, MS, DABCN.



Page printed from:

http://www.dynamicchiropractic.com/mpacms/dc/article.php?id=55133&no_paginate=true&p_friendly=true&no_b=true