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Give Yourself a Nutritional Adjustment

By David Seaman, DC, MS, DABCN

The Diet-Induced Pro-Inflammatory State -

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(Editor's note: This is the third in a six-part series on the diet-induced pro-inflammatory state.)

In the March/April issue of *JMPT*,¹ I published an article that described how we "eat ourselves into an inflamed state," that is, a condition which promotes chronic pain and such inflammatory conditions as cancer, heart disease, and Alzheimer's. Readers need to appreciate that the inflammation that drives these conditions is subclinical and chronic, unlike what you see after an acute injury. Atherosclerosis is now viewed as a chronic, smoldering inflammatory state that develops slowly and unnoticed - until one has a sudden heart attack. (The most recent and easy-to-read review of this subject is "A Fire Within: Inflammation's Link to Heart Disease," published in the May 2002 edition of *Scientific American*.)

We need to appreciate that the chronic, subclinical inflammation that drives atherosclerosis is not limited to blood vessels. It is the body that is subclinically inflamed, and the area of primary manifestation just happens to be in the coronary vessels. Depending on one's genetic predisposition, some may develop atherosclerosis; others may get cancer; still others develop Alzheimer's or osteoporosis. Some may just suffer with back pain, headaches or a sensitive gut.

Respective of the location of the tissue dysfunction or disease, it seems reasonably clear that a poor diet is responsible for driving the subclinical chronic inflammatory state. In short, a diet that is deficient in fruits and vegetables will ultimately promote inflammation. How might this be? First, the phytonutrients and fatty acids in fruits and vegetables are anti-inflammatory. And second, consider what people who avoid fruits and vegetables eat. They eat copious amounts of pro-inflammatory grains in the form of bread; muffins; pasta; cereal; chips; pretzels; and dessert foods.

To put it mildly, and not very scientifically, Americans are bread-eating fools. (I use the word "bread" to refer to all of the grain products mentioned above.) They are so convicted in their bread-eating efforts that most get nervous and wonder what they might eat if they stop eating bread in all its forms. Understand that bread is a new food from an evolutionary perspective, so it is kind of shocking to consider that we have no idea about what to eat if we can't reach for a piece of bread.

Consider that humans existed as noncereal-eating hunter-gatherers since the emergence of *Homo erectus* some 1.7 million years ago.² The sum of evidence indicates that the human genetic constitution has changed little over the past 40,000 years. The addition of cereal grains some 5,000 to 10,000 years ago represents a dramatic departure from those foods to which we are genetically adapted - wild game, fruits and vegetables.² Today, the absurd level of grains consumed by most people is truly an assault on our genes. We feed bread to our cattle and other animals; we even raise fish in farms where they are fed bread. In contrast, consider that game animals either eat foliage, fruit or smaller animals that have also fed on foliage and/or fruit.

What Makes Grains Pro-Inflammatory?

Many people make the mistake of thinking that whole grains are healthy, while refined grains represent the problem. This is an incorrect notion. Grains, in general, are problematic, and here is why. Grains and bread contain excessive amounts of pro-inflammatory omega-6 fatty acids, gluten (to which many are sensitive) and lectins that inflame the gut and promote systemic disease. They are deficient in such key nutrients as vitamins C, A, B₁₂ and beta-carotene.¹ The pH of grains is acidic. Lowering body pH can promote inflammation, pain and osteoporosis. A small amount of grains is not a problem for most, but they become problematic when they are relied upon extensively. The "food pyramid" guide, for example, suggests that we get 6-11 servings of grains per day. There is no good evidence for this quantity of grain consumption. Most of us would do much better if we were to replace pro-inflammatory breads with anti-inflammatory

fruits and vegetables.

Omega-6 Fatty Acid Imbalances

While grains harbor many problematic substances, I will focus herein on the omega-6 fatty acids. We are genetically accustomed to a 1:1 ratio of omega-6 (n6) to omega-3 (n3) fatty acids. Under 4:1 is an acceptable ratio, however, as the ratio increases, so does inflammation. The average American's ratio range is from 10:1 to 30:1, reflecting an extreme aberration that creates a pro-inflammatory state, which is thought to promote pain; inflammation; cancer; heart disease; Alzheimer's disease; inflammatory gut disease; depression; osteoporosis; and most of the other chronic diseases from which we suffer. In general, n6 fatty acids result in the production of eicosanoids (prostaglandins, leukotrienes, and thromboxanes) and cytokines that are pro-inflammatory. Omega-3 fatty acids, on the other hand, have the opposite effect on eicosanoids and cytokines.

Linoleic acid is an n6 fatty acid in great abundance in grains, while alpha-linolenic acid (ALA) is an n3 fatty acid in green vegetables. Grains contain only miniscule amounts of ALA, the anti-inflammatory n3 fatty acid.

Consider oatmeal, a very common breakfast food, for example. In one quarter of a cup of rolled oats, we are treated to .44 mg of linoleic acid (n6) and .02 mg of linolenic acid (n3), which reflects a 21:1 ratio of n6 to n3.³ White bread provides a 21:1 ratio, while whole wheat contains a 27:1 ratio.³ Potato chips boast a 60:1 ratio, and corn chips provide a 12:1 ratio.³ I suggest throwing away all of these foods, and avoid consuming grains, such as those in bread, for at least three months. Thereafter, have one serving per day, if you wish.

What about vegetables? Broccoli provides an impressive 1:3 ratio of n6 to n3, and kale offers a 1:1.3 ratio, while most lettuces give a 1:2 ratio.³ Fish ranges from 1:1 to 1:7, which represents the most significant source of n3 fatty acids. Obviously, this reflects the values found in fresh fish that is baked, broiled or steamed, and not packaged fish found in the frozen food section of the store, or deep-fried at your local fast-food restaurant.

The ratio of n6 to n3 in fruits generally ranges from 2:1 to 1:1. For example, blueberries are noted for their heavy concentration of bioflavonoids; they produce a 4:3 ratio of n6:n3. Cherries are also rich in flavonoids and provide a 1:1 ratio. The banana, one of the more commonly eaten fruits, possesses a 2:1 ratio.³

Clearly, the mainstay of our diet should be fruits, vegetables and fish. You can also buy special n3-rich eggs from your supermarket or health food store. Grass-fed beef rich in n3s is also available; however, you need to order it on line.

Omega-3 Supplements

At this point, it should be clear that we gorge ourselves with n6 fatty acids and create a pro-inflammatory state that drives inflammation, pain and chronic disease. Regretfully, it is nearly impossible to ensure a proper ratio of n6:n3 if you plan to do anything but shop and prepare meals. I strongly suggest that you immediately begin a lifelong supplementation program involving n3 fatty acids, particularly eicosapentaenoic acid (EPA) and docosahexanoic acid (DHA). We find these in fresh fish and wild game to varying degrees. However, they are most commonly associated with fish, so EPA and DHA supplements are typically referred to as fish oil.

The standard fish oil capsule contains 180 mg of EPA and 120 mg of DHA - a total of 300 mg of n3 fatty acids - an amount that reflects what is normally found in fish. It is not known exactly how much EPA or DHA we should take. Some experts suggest one gram daily, which amounts to 3-4 capsules per day.⁴ I suggest anywhere from 1-3 grams daily, depending upon a patient's size, diet history and overall condition.

I also suggest taking flaxseed oil, which contains ALA. Each flaxseed oil capsule contains 500 mg of ALA. The standard recommendation is two grams of ALA per day, a total of four capsules.⁴

These fatty acids do not represent pharmacologic amounts, and are designed to provide the level that we would normally get in the pre-grain period of history. They are without side effects, and there are only a select handful of patients who need to be careful with n3 supplements. Simopoulos,⁴ the leading expert in n3 fatty acids, explains that people with asthma should take them only under close supervision by their doctors. While n3s have been highly beneficial for some asthmatics, they have increased bronchial sensitivity in others. People with diabetes should take no more than three grams per day, because higher amounts might disrupt glucose regulation. People with clotting disorders, or who are taking very potent blood thinners, should not take n3 fatty acids unless prescribed by a physician. Omega-3 fatty acids slow clotting time, and there is no way of predicting the net effect.

Conclusion

This article represents an introduction to the subject of fatty acids and the diet-induced pro-inflammatory state. There are numerous articles that cover this subject in great detail. My recent paper in JMPT contains a long list of references that are clinically relevant.

As a clinician, you should consider n6:n3 imbalances to be perhaps the most important nutritional issue for you and your patients. Fortunately, it is relatively easy to shift the balance back to normal. The essential goal is to avoid the bread family, which loads our cells with inflammatory n6 fatty acids. We need to consume liberal amounts of fresh fruits and vegetables, and focus particularly on the green leafy veggies. Try to eat fresh fish as often as possible, and make sure to take at least one gram of EPA or DHA and two grams of ALA per day.

It is not uncommon to see a significant reduction in pain complaints within one to two weeks. I recently presented a seminar in Jacksonville, Florida, at the FCA spring convention. One of the attending doctors later told me that within 10 days of following this prescription, he lost five pounds, and 50 percent of his chronic athletic pains had disappeared. This outcome is quite common. I receive many communications from fellow chiropractors stating that chronic back pain, foot pain, and headaches are resolving within a month.

Please realize that such testimonials are coming from chiropractors that already got adjusted and understood the importance of the adjustment. However, they were all missing an important element of care. The adjustment primarily addresses the mechanical problem associated with a painful musculoskeletal condition, however, mechanical adjustments cannot influence tissue concentrations of pro-inflammatory fatty acids. Only with nutrition can we change the balance of fatty acids in our cells. Accordingly, we should view the addition of n3 supplements as a nutritional adjustment. I personally view an adjustment to be incomplete without nutrition.

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