

A Common Antioxidant – NAC - Could Cause Trouble

Researchers at the University of Virginia Health System have discovered troubling side effects of N-acetylcysteine (NAC), a common antioxidant used in nutritional and bodybuilding supplements. NAC can form a red blood cell-derived molecule called nitrosothiol that fools your body into thinking there's an oxygen shortage, which can lead to pulmonary arterial hypertension (PAH). PAH is a serious condition, where the arteries in the lungs narrow, increasing the blood pressure in your lungs, causing the right side of your heart to swell.

Lead researcher Dr. Ben Gaston, noted that this is an entirely new understanding of how oxygen is sensed by the body. As it turns out, your body responds to the *nitrosothiols*, which are created when a decreased amount of oxygen is carried by red blood cells -- not to the amount of oxygen dissolved in the blood.

So far, studies have only been performed on mice. The next step is to determine the threshold at which the antioxidant becomes detrimental to heart and lung function in humans.

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Dr. Mercola's Comments:

N-acetylcysteine (NAC) is an acetylated amino acid and a precursor of [glutathione](#), another potent antioxidant that prevents free radical damage from toxic exposures. NAC is also a common emergency room treatment for people who have overdosed on acetaminophen (the active ingredient in pain relievers like Tylenol).

Interestingly, NAC is actually used to treat several types of lung disease, and although this animal study connects it with constriction of lung arteries, at least one [other study](#) has linked NAC with **improved** blood flow, stating NAC might increase the biologic effects of [nitric oxide](#) by combining with it to form S-nitrosothiol, which is a potent vasodilator. They found that NAC also increases the expression of nitric oxide synthase and may improve blood flow as well.

Dr. William LaValley from Austin, Texas, who is an expert in this area and has reviewed the literature thoroughly, successfully uses supplements as a therapeutic tool in many chronic conditions including cancer. He feels that PAH may be species specific and possibly won't happen in humans, and more importantly, the study used much higher doses than are generally used in humans. There are many studies supporting the anti-oxidant benefit of NAC for pulmonary function in cystic fibrosis, post-radiation, and other high oxidant conditions. Dr. LaValley's conclusion is that a little is probably ok - perhaps good for you. He has used NAC liberally in his therapeutic protocols for nearly 20 years and has not observed any problems with it. However using large quantities is probably not good for you. Long-term high doses are probably not so good for several reasons - including the possibility of PAH.

The study says that the doses are higher than usual in humans - but we know that the supplement manufacturers have been making 500mg NAC caps and selling them by the truckload for years. My biggest concern is the use of NAC by cancer patients who think it is helping - when in fact it may be harmful to them by protecting cancer cells and counteracting what potential benefit they may get from some conventional treatments. It's a thorny issue.

So, if used therapeutically, it should be used in low doses for “*prevention*”. High doses should be restricted to disease/stress states that have a likelihood of high reactive oxygen species generation (such as trauma, certain types of infection, malnutrition, and certain types of toxicity).

Dr. LaValley feels that 200-500 mg once a day is probably OK in most non-cancer cases. NAC is an important consideration for inclusion, at some reasonable dose, in anti-aging formulas.

However, please remember that the best way to get antioxidants into your system is to make sure you’re getting them from organic, functional foods, not just from supplements alone, because these are often isolated synthetics rather than the readily bioavailable version. What you should practice is the *Goldilock’s Equation* – not too many, and not too few – to achieve and maintain optimal health; it is quite easy to overdose when you take supplements. Fortunately, your body does a phenomenal job of self-regulating many of these levels if you supply it with wholesome, healthy foods and limit your intake of processed foods, which are frequently loaded with artificial chemicals.

Normalizing your insulin and leptin levels is also quite helpful, as elevated insulin and leptin levels cause absolute biochemical havoc in your body and worsen nearly every major part of your physiology. Normalizing your blood sugar will raise glutathione levels naturally, as opposed to taking glutathione or precursor supplements.

Glutathione, along with vitamin E, vitamin C and alpha lipoic acid are the basic antioxidants. Some nutritional authorities recommend you take it as a supplement, or take an NAC supplement. There are problems with both. First, the form of glutathione that works best is the reduced form, which is very difficult to absorb orally. Secondly, I advise against using NAC if you still have mercury amalgam fillings because it could interfere with the detoxification of the mercury.

It is much better to get glutathione through items like **alpha lipoic acid** that regenerates glutathione. It also has the added ability to generate other antioxidants such as vitamins C and E. The best sources of alpha lipoic acid are red meat and organ meats. Just make sure to stick with grass-fed organic meats in order to get the maximum nutrient content and none of the added antibiotics or pesticides.

Glutamine is also a useful nutrient that improves intestinal health and also serves as a direct precursor to glutathione, and some investigators believe it to be the rate-limiting nutrient for glutathione formation. However, in large quantities it can be problematic as Dr. Blaylock outlines in his book “*Excitotoxins*”.

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