To C or Not to C

A powerful antioxidant gets a bum rap

September 1, 1998 By Lark Lands, PhD

Big media hoopla greeted an April New York Times story, widely reprinted, about research supposedly showing that a 500-milligram dose of vitamin C could damage DNA, the molecule that forms your genes. These reports have worried and confused many PWAs who have long used this powerful infection-fighter at considerably higher doses. But a bevy of scientists has criticized the study and what they consider the imbalanced media coverage of it.

The research assessed vitamin C's potential for both antioxidant effects—the good kind that protect your cells from oxidative damage by free radicals and other unstable molecules—and pro-oxidant effects—the bad kind that could damage cells. Reporting on a letter published in the journal Nature by University of Leicester (England) researchers, the Times story focused on the increase in a particular marker of DNA damage called 8-oxoadenine.

Many scientists strongly questioned the validity of this research, noting that other studies have found that vitamin C not only does not increase the levels of this marker, it actually protects against DNA damage in blood cells, eye lenses and sperm.

In addition, they pointed to the very significant finding—buried in the ninth paragraph of the Times story—that another marker of oxidative DNA damage, 8-oxoguanine, went down. That's a good thing, showing that the vitamin C was, in fact, working as an antioxidant to protect cells. And, not mentioned by the newspaper reports, this marker has been far better studied and is considered by many scientists to be a much more significant indicator of oxidative damage than 8-oxoadenine. In fact, other researchers have found that 8-oxoguanine—the one that decreased—has 10 times or greater potential to cause genetic damage than 8-oxoadenine.

Bruce Ames, PhD, a researcher at the University of California, Berkeley, and an expert on DNA damage, called the study simply "bad science." According to Ames, about half of all chemicals, natural and synthetic, cause DNA damage. This includes compounds found in most fruits and vegetables. Luckily, the body has a very capable repair system, based largely on B vitamins, that efficiently mends DNA, despite the estimated 100,000 DNA-damaging events that each cell suffers daily.

Ames and two Berkeley colleagues, along with Balz Frei, PhD, director of the Linus Pauling Institute

at Oregon State University and a top micronutrient researcher, have sent Nature a letter challenging several aspects of the study's methods and calling its conclusions "unwarranted." Yet the Times story included no quotes from these or other critics, only applause from a longtime crusader against supplementation in general, Victor Herbert, MD.

Scientists offer two cautions when headlines trumpet scary-sounding findings about nutrients:

Consider the totality of evidence. Frei notes that many studies have shown that vitamin C appears to help lower the risk of cancer, heart disease and other serious medical problems. And it has repeatedly been found to work as a powerful antioxidant, as well as a natural anti-inflammatory—both valuable to PWAs, who must cope with much oxidative stress and inflammation. Used in relatively high doses, it is also an effective antiviral against many infections. In test-tube studies by the Linus Pauling Institute in 1991, vitamin C was even found to work well against HIV, although this research was never followed up in PWAs due to—you guessed it—lack of funding.

Don't look at one nutrient in isolation. As noted by Lester Packer, PhD, another Berkeley researcher, all antioxidants work as a team in the body, constantly recycling each other back and forth between pro-oxidant and antioxidant. The nutrients most important for achieving this with vitamin C are alpha-lipoic acid, glutathione, carotenoids and coenzyme Q-10. As long as your body is plentifully supplied with all the important antioxidants and the other nutrients like B vitamins that work with them, you will have antioxidant protection.

Rob Keller, MD, an immunologist and medical director of the Biodoron Clinic in Hollywood, Florida, recommends daily comprehensive nutrient supplementation, including multiple antioxidants, to his 500-plus HIV positive patients. He says: "I'm a very simple person. I do what the body accepts. The body will allow 2,200 mg of vitamin C at any given time. And since it doesn't stick around long, I recommend that dose be taken two or three times per day with meals." Keller urges taking vitamin C along with the other nutrients that work with it.

So the next time a headline tempts you to throw your supplements away, get a second opinion. As Frei of Oregon State puts it, "You have to look at the big picture, not one little part or one single study."
