**Global Challenges/Chemistry Solutions**

**Combating disease: Should people over age 50 watch their copper and iron intake?**

Combating disease . . . providing clean water and safe food . . . developing new sources of energy . . . confronting climate change. Hello, from the American Chemical Society — the ACS. Our 161,000 members make up the world’s largest scientific society. This is “Global Challenges/Chemistry Solutions: New Solutions 2010.” Global Challenges 2010 updates the ACS’ award-winning podcast series. Today’s topic is research on combating disease. This work shows how high levels copper and iron might contribute to increased rates of heart disease, Parkinson’s disease and Alzheimer’s disease for people over age 50.

**Too much of a good thing?**

Copper and iron are two of the most common metals on earth. They’ve helped build our railroads and carry electricity throughout the world. Copper and iron also are nutrients essential for good health. If people don’t get enough iron in their diets, or in dietary supplements, they may develop the blood disorder, anemia. A deficiency of copper can increase the risk of heart disease.

But you can certainly get too much of a good thing. A new report in the American Chemical Society journal, *Chemical Research in Toxicology* citesgrowing scientific evidence that too much copper and iron can be bad for older people. Those studies link high levels of copper and iron to Alzheimer’s disease, heart disease, and other age-related disorders. Dr. George J. Brewer, a medical doctor and authority on human genetics, wrote the article. Brewer studied these topics for more than 20 years at the University of Michigan Medical School. Dr. Brewer suggests specific steps that older people can take to avoid build up of unhealthy amounts of these metals in their bodies.

For more, here’s Dr. Brewer:

“This story of copper and iron toxicity, which I think is reaching the level of public health significance, is virtually unknown to the media or the general public. … When we think of metal toxicity, most of us think of the villains, such as lead and cadmium. Not so much do we think of the good guys, the essential metals, such as copper and iron, that make essential contributions to our lives. Of course, physicians are aware of copper and iron toxicities in Wilson’s disease and hemochromatosis, respectively, where the body is grossly overloaded with these metals. I want to tell the story of the more subtle toxicity of copper and iron that does not just affect a limited number of us, but may affect almost all of us as we age.”

Brewer points out that copper and iron are essential nutrients for life, with high levels actually beneficial to the reproductive health of younger people. After age 50, however, high levels of these metals can damage cells in ways that may contribute to a range of age-related diseases.

Brewer says that many major diseases affecting those over 50, including atherosclerosis and Parkinson’s disease, may be linked to high free copper levels in the blood. He also suggests that Alzheimer’s disease may have arisen from increased copper and iron consumption in the post-industrial age.

As Dr. Brewer put it:

“It appears very likely that copper and iron toxicity are occurring, but in somewhat subtle ways, in a large proportion of our population. Both copper and iron toxicity are likely contributing to Alzheimer’s disease. There is a major epidemic of Alzheimer’s disease in the industrialized world. Careful research has shown that this disease did not exist until 100 years ago. It still is rare in India and Africa. There is something about industrialization that has brought this disease on in the developed world in epidemic proportions. Some researchers think it is due to the consumption of beef because they think it is a prion disease. I think it may be due, in part, to increased meat ingestion because of the increased bioavailability of copper and iron from meat, but may also be due in part to the increased use of copper pipes for plumbing in developed countries and the increased ingestion of copper supplements.”

Fortunately, there are some easy ways of limiting copper and iron intake. Here again is Dr. Brewer:

“I have provided some relatively simple ways of lowering the risks of free copper and iron, by throwing away supplements containing these metals, by lowering meat intake, and by avoiding drinking water with elevated levels of copper. I have also reviewed more rigorous methods of lowering free copper and free iron exposure, by taking zinc to lower copper and using blood donation to lower iron. These latter steps are not medical advice (for which one should see one’s doctor) but are simply information to use or not use as one sees fit. … It seems clear that large segments of the population are at risk for toxicities from free copper and free iron, and to me, it seems clear that preventive steps should begin now.”

As Dr. Brewer said, his article — and this episode of Global Challenges — is not personal health advice. Your own physician is the best source for that. If you have concerns about copper and iron intake, talk with the doctor first.

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