



Copper may play a role in Alzheimer's disease

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WASHINGTON (Reuters) - How much copper you take in could influence your risk of Alzheimer's disease, U.S. researchers reported on Monday.

Their studies have only been done in rabbits so far, but raise important questions about the amount of copper allowed into the water supply.

Rabbits that drank distilled water did not develop an animal version of Alzheimer's disease, but when ordinary tap water containing copper was given to them, they did, said Dr. Larry Sparks of Sun Health Research Institute in Sun City, Arizona, who led the study.

"Copper is an essential nutrient but has also been implicated as an important factor in Alzheimer's disease," Sparks and Bernard Schreurs of West Virginia University wrote in their study, published in the Proceedings of the National Academy of Sciences Early Edition.

"This is something we need to investigate," Sparks said in a telephone interview. The U.S. Environmental Protection Agency has a maximum contaminant level goal for copper in drinking water of 1.3 parts per million. Levels in the rabbits' drinking water were well below that. "We are working at one tenth that," Sparks said.

Sparks said his work was done in a rabbit model of Alzheimer's disease. The rabbits develop symptoms and physical signs of the condition when fed a high-cholesterol diet.

COPPER CAUSES PROTEIN BUILDUP

He believes that copper somehow interferes with the body's ability to clear the amyloid-beta protein that is an important component of the senile plaques that clog up the brain of an Alzheimer's disease patient.

"If there is no copper in the water, then the amyloid beta is shuttled to the blood for clearance," he said.

Alzheimer's disease affects about 4 million Americans and 15 million people worldwide. It is always fatal and there is no cure, although some treatments may help for a while. Symptoms start with mild memory loss, but patients eventually become senile and helpless.

After death, their brains are filled with senile plaques and tangles of nerve cells.

Genetic as well as environmental causes seem to contribute to the development of the disease, but the precise cause is still unclear.

Sparks has been working with rabbit models of Alzheimer's disease for years. "Every time I ever fed a bunny cholesterol, I got Alzheimer's pathology," he said.

That is, until he moved to the Sun City lab.

"I said, 'Something is wrong. I go down into the vivarium (where lab animals are kept) and the first thing I see is the wall being lined with big blue bottles.'"

It turns out the rabbits there were given distilled water, while all the other research animals Sparks had worked with got tap water.

He analyzed the tap water from previous labs and found it contained copper. When the rabbits at Sun Health were fed tap water, they also developed Alzheimer's symptoms.

When Sparks added copper to the distilled water and gave the rabbits cholesterol, they also developed Alzheimer's-like symptoms and brain lesions.

This does not mean that copper pipes are bad, Sparks said. "Metal pipes are inert. I could throw a penny in a gallon of water and get no copper into the water," he said. But acid in the water can cause copper to leach out.

Sparks also checked for zinc, aluminum, iron and other metals, but did not find them consistently in the drinking water his experimental rabbits were given.

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