Friday Favorites: Does Aluminum Cause Alzheimer’s Disease? Transcript

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Origins of the aluminum hypothesis

[music] >> The so-called aluminum hypothesis for the cause of Alzheimer's disease dates back to 1965 when the inadvertent injection of aluminum into the brains of rabbits caused neurological symptoms along with what initially looked like Alzheimer's disease tangles in the brain.

Then, the 1970s was first reported that the aluminum content of Alzheimer's brains was higher than that of control brains on autopsy. Following that, there was a rash of fatal dementia cases attributed to dialysis fluids contaminated with aluminum.

This trio of findings led researchers to suggest that aluminum, the third most abundant element on Earth after oxygen and silicon, may play a role in the development of Alzheimer's disease.

Evidence against aluminum causing Alzheimer's

The first crack in the theory was the realization that upon closer inspection, the tangle-like changes in rabbit brains were not much like those found in human Alzheimer's disease after all.

The changes in aluminum-induced dialysis encephalopathy were also dissimilar. Aluminum could certainly be toxic to the brain, but not necessarily in a way that had anything to do with Alzheimer's disease. And subsequent autopsy studies of Alzheimer's victims did not consistently find higher aluminum levels, and even if they did, elevations in brain aluminum could be a consequence rather than a cause, reflecting Alzheimer's disease damage to the blood-brain barrier. The aluminum hypothesis came under heavy fire in the scientific community. Only later did we learn that the most vocal critics were secretly paid aluminum industry hacks. In hindsight, that was probably unnecessary as the tide of evidence eventually turned against the role of aluminum. What convinced me was a meta-analysis that failed to find a connection between regular antacid use and Alzheimer's.

Antacid exposure and aluminum intake

Processed food contain a variety of aluminum containing additives such as anti-caking agents in pancake mix, melting agents in American cheese, meat binders, gravy thickeners, rising agents in some baking powders, and dye binders in candy. However, over-the-counter antacids are probably the most important source for human aluminum exposure in terms of dose.

In terms of the safety of dietary aluminum, the tolerable weekly intake is 1 mg per healthy kilogram of body weight. So, if you weigh about 150 lb, you shouldn't get more than like 10 mg a day.

>> [snorts] >> One day of Maalox can give you 3,800 mg, nearly 400 times the daily safety limit. And nowhere on the label does it say not to take with acidic beverages such as fruit juice.

Washing an antacid down with orange juice can increase aluminum absorption eightfold. The total aluminum intake in drinking water and processed foods in most countries may only be a few milligrams a day, but some antacids can increase daily aluminum consumption by up to several grams, a thousandfold higher. And so, if antacid use isn't related to Alzheimer's risk, then ingested aluminum is unlikely to be a cause.

Other aluminum sources and safety concerns

Now, as I explored in my videos on cooking with it, just because aluminum doesn't cause Alzheimer's, it doesn't mean aluminum intake is necessarily benign. Those who cook with aluminum and store acidic foods like yogurt and tomato in aluminum cookware suffer significantly more DNA damage, leading some regulators to recommend

consumers avoid the use of aluminum pots or dishes for acidic or salted foodstuffs.

In my video on antiperspirants and breast cancer, I note how the FDA and European safety authorities specifically advise against using aluminum antiperspirants on damaged skin, which may even include avoiding them after shaving. As a metalloestrogen, aluminum absorption may explain why breast cancer may occur as much as 20 years earlier in women using antiperspirant and shaving their armpits more than three times a week.

You can also avoid high dietary sources by choosing non-aluminum baking powder for baking and avoiding processed cheese. Aluminum salts can give cheese desirable slicing properties, but that means a single grilled cheese sandwich can end up exceeding the World Health Organization's provisional tolerable daily intake of aluminum by as much as 400%.