Alzheimer’s Disease and Aluminum Exposure



Does Aluminum Cause Alzheimer’s Disease?

“Can aluminum cause Alzheimer’s disease?” is a controversial question. Alzheimer’s disease is the most common cause of senile brain disease and is a fatal and untreatable condition. It begins with learning memory deficits and progresses to involve all aspects of intellectual activity including judgement, calculation and language.

Post-mortem examinations of humans with Alzheimer’s disease show that there are high concentrations of aluminum in the brain. However, aluminum normally is not found in healthy brain tissue and researchers do not know how the metal gets into the brain. Experimentally it is proven that aluminum is toxic to nerves in animals but the neuron degeneration is different from what occurs in humans.

The animals that respond to aluminum treatment with neuron degeneration are rabbits, cats and dogs. If these animals are injected with aluminum salts directly into the brain they show learning memory deficits, become slower and lose curiosity. This picture resembles remarkably certain features of Alzheimer’s disease. But the neuron degeneration is not the same as the one seen in Alzheimer’s disease.

In conclusion, the cause of Alzheimer’s disease and any association with aluminum is still unknown. However, researchers caution that more studies are required.

What Are The Sources of Aluminum Exposure?

Workers can be exposed to aluminum during production or processing of this metal and its alloys. In addition to workplace exposure, people can come into contact with aluminum in many other ways.

Aluminum is found in food, drinking water and in some medications. There has been considerable interest and controversy concerning the relationship between aluminum in drinking water and Alzheimer’s disease. So far, the results of many studies have been inconclusive and contradictory. It is important to note that the content of this metal in the diet is increased by the use of aluminum and

its alloys in the food industry. The cooking and storage of food in aluminum ware has also been noted. This route of exposure is considered to be a very small percentage of the average person’s intake of aluminum, and that it would be difficult to avoid this exposure even if aluminum were clearly implicated in the development of the disease.

Are There Exposure Limits For Aluminum?

In the workplace, the American Conference of Governmental Industrial Hygienists (ACGIH) has assigned an occupational exposure limit based on respirable particle size.

The current ACGIH recommended Threshold Limit Value Time-Weighted Average (TLV-TWA) exposure limit for aluminum in the air is 1 mg/m3 for aluminum metal (CAS number 7429-90-5) and insoluble compounds.
Aluminum metal and insoluble compounds of respirable particle size are also categorized by ACGIH for carcinogenicity as A4 – Not classifiable as a Human Carcinogen; agents which cause concern that they could be carcinogenic for humans but which cannot be assessed conclusively because of a lack of data.

The TLV-TWA is the time-weighted average airborne concentration for a normal 8-hour workday and a 40-hour workweek to which it is believed that nearly all workers may be exposed repeatedly, day after day, without adverse health effects.
In many jurisdictions, exposure limits are the same as or similar to the ACGIH TLVs. Since the manner in which exposure limits are established, interpreted and implemented can vary, the appropriate government agency in each jurisdiction should be consulted.