Multiple sclerosis drug serves as model for potential drugs to treat botulism poisoning

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Scientists are reporting that variants of a drug already approved for treating multiple sclerosis show promise as a long sought treatment for victims of bioterrorist attack with botulinum neurotoxin -- which is 10,000 times deadlier than cyanide and the most poisonous substance known to man. The potential drugs also could be useful in treating other forms of botulism poisoning as well as Alzheimer's disease, multiple sclerosis, and myasthenia gravis, they say in an article in *ACS Chemical Biology*.

Kim D. Janda and colleagues explain that the lack of any approved drug treatment for botulism poisoning leaves a major gap in defenses against bioterrorism and biological warfare. People exposed to botulism toxin develop paralysis, cannot breathe, and may require months of treatment on respirators. "The numbers of medical care units capable of providing supportive care for recovery in the event of a bioterrorism incident would be limited," they note.

The scientists knew that the multiple sclerosis drug diaminopyridine showed promise for working inside nerve cells to counteract the effects of diaminopyridine botulism toxin. However, diaminopyridine itself had disadvantages, including its ability to pass into the brain and have toxic effects on brain tissue. They modified the molecular structure of diaminopyridine to produce two new substances that did not enter the brain and showed good potential as botulism treatments in mice that had been paralyzed by the toxin.

More information: "Symptomatic Relief of Botulinum Neurotoxin/ A Intoxication with Aminopyridines: A New Twist on an Old Molecule", *ACS Chemical Biology*.

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