

Medical researchers fear wider spread of paralysis linked to mysterious polio-like virus

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Medical researchers fear that more children will develop paralysis from a mysterious polioliike illness that has struck every two years since 2014.

The condition, known as acute flaccid myelitis, or AFM, is rare and has reached its peak for 2018. It will likely continue to fade as winter approaches. But many believe it will be back.

"AFM is here, and it doesn't seem to be going anywhere," said Dr. Benjamin Greenberg, a neurologist at UT Southwestern Medical Center's Peter O'Donnell Jr. Brain Institute and at Children's Health.

When a cluster of children in the U.S. developed unexplained paralysis in 2014, doctors hoped the outbreak was a freak event. Then, in 2016, more people came down with the same set of symptoms. This year, AFM struck a record 165 people, the majority of them young, previously healthy children.

Texas has reported 27 cases in 2018, according to the Texas Department of State Health Services, including five in Tarrant County, three in Collin County and two in Dallas.

Experts say we should expect the condition to return again in 2020, following a pattern of sickening patients every other year from summer through fall.

Investigators at the U.S. Centers for Disease Control and Prevention say

they do not yet know what triggers the paralysis.

"As a mom, I know what it's like to be scared for your child, and I understand parents want answers," Dr. Nancy Messonnier, director for the National Center for Immunization and Respiratory Diseases, said at a November news conference. "CDC is a science-driven agency. Right now the science doesn't give us an answer."

To gear up for another possible outbreak, the agency formed an AFM task force. It has funded state health departments to boost surveillance and is educating doctors about what to look for and test for when patients present with unexplained limb weakness.

"It is impossible to say if we'll have any real answers (by 2020), because this a complex public health challenge," said Dr. Thomas A. Clark, a medical epidemiologist who is leading the CDC's response to AFM, in a statement to The Dallas Morning News. "Until we fully understand what causes AFM, we can't help protect people against it."

Many experts, including Greenberg, say the agency has been slow to name viruses as a probable cause.

The 2014 AFM outbreak coincided with the largest national outbreak of a virus known as D68, which had previously been associated mainly with respiratory infections. Forty-two percent of AFM patients tested in 2018 were found to have D68 in their nasal passages.

Experts point to other evidence that makes D68 a likely culprit. Like polio, D68 is an enterovirus, part of a large group of common pathogens that cause colds, stomach bugs, eye infections, and hand, foot and mouth disease. Like AFM, enteroviruses exhibit cyclical patterns. Polio, too, sickened most children in late summer and fall. And almost all AFM patients had fevers and other cold symptoms three to 10 days before

becoming paralyzed.

"We are in a place to say a significant portion, if not the majority, of AFM cases that occur between August and November every other year are due to a virus, and likely an enterovirus, and likely D68," said Greenberg, an expert on spinal cord inflammation who has been treating and following AFM patients since the outbreak began. He is a member of the CDC task force.

"I don't think it's 100 percent," he said. "But I would like to see the language at least embrace that."

The CDC has countered that D68 and many other common viruses circulate in late summer and fall and that the findings from nasal swabs could be coincidental. To confirm causation, the CDC says it would need to isolate enterovirus D68 from the spinal fluid of AFM patients. In 2018, only one spinal fluid sample came back positive for D68. Other viruses were present in spinal fluid and nasal swabs, as well.

"While we agree that a leading hypothesis is that viruses are playing a role in AFM, at this time, the science does not indicate to us a single cause of AFM," said the CDC's Clark.

Enterovirus D68 was first detected in Berkeley, Calif., in 1962 after it triggered severe lung infections in four children. Since then, health agencies have reported minor outbreaks in Europe, Africa and Southeast Asia, but cases involved mainly colds and lung infections. Then, in 2014, D68 sickened more than 1,000 people in the U.S. with severe colds, bronchitis and pneumonia. That year, 120 people also developed AFM.

Researchers have discovered that D68 has developed an ability to invade and kill nerve cells.

In a September study, published in the peer-reviewed open access journal mBio, researchers injected older and recently isolated forms of D68 into mice and tracked their symptoms. They found that D68 specimens isolated before 2014 were unable to infect and replicate inside the spinal cord. But mice injected with newer variants of D68 developed symptoms similar to AFM. The researchers said they were especially troubled to see that these newer forms of D68 seemed to be crowding out older more benign variants.

"The scary part is that these new lineages seem to have become the predominant lineages circulating worldwide," said Richard Scheuermann, a study author and director of the La Jolla campus at the J. Craig Venter Institute in California. The finding may mean that we'll see an increased incidence of AFM in children, he said.

The vast majority of patients who contract D68 never develop limb weakness. That's another mystery scientists are trying to solve. Why do some people and not others get very sick?

In the case of polio, the virus paralyzed only about 1 in 200 people that it infected.

Experts believe that some people may have a genetic predisposition to AFM or that their immune systems may be weakened from fighting other infections.

There's also the possibility that at least some cases of AFM are caused by the patient's own [immune system](#). D68 or another trigger may cause the immune system to overreact and attack nerve cells in the body.

Greenberg has seen both types of cases among his patients and treats them differently based on their symptoms and on MRI scans. Those with inflammation caused by an immune response tend to do better, because

steroids can calm the inflammation, he says. Those with spinal cord damage caused directly by the virus warrant different treatments and don't respond as well.

Overall, a majority of patients recover, though the recovery can take years. Among 44 AFM patients he has followed, more than half had excellent, very good or good recoveries after treatment.

Greenberg said doctors and public health officials need to assume AFM will be back.

"If we're not assuming that, we're all making a mistake," he said. "We have to plan and be ready, scientifically, to pounce."

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