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INSIGHT

Acute Flaccid Myelitis: How CDC Assists States in Investigating Emerging Diseases

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Concern has grown over the recent increase in Acute Flaccid Myelitis (AFM) cases around the country. According to the Centers for Disease Control and Prevention (CDC), AFM is a rare condition with no specific treatment that mostly impacts children. AFM affects a person's nervous system, particularly the gray matter of the spinal cord, causing weakness in the arms and legs along with other symptoms. Media reports often refer to AFM as a "polio-like condition" because its symptoms mirror those associated with poliovirus infection. To date, all AFM cases have tested negative for poliovirus, and no single pathogen (germ) has been consistently detected in the patients' spinal fluid. Some tests have detected enteroviruses or rhinoviruses, but no one virus type can explain all the cases.

As of November 9, CDC has confirmed 90 cases of AFM in 27 states thus far in 2018. CDC began tracking AFM in August 2014, when there was a sudden increase in cases in the United States. As shown in **Figure 1**, AFM cases have risen in late summer/early fall of 2014, 2016, and now in 2018. Though cases have increased, AFM remains a rare disease. CDC estimates that fewer than one to two in a million children in the United States get AFM each year.

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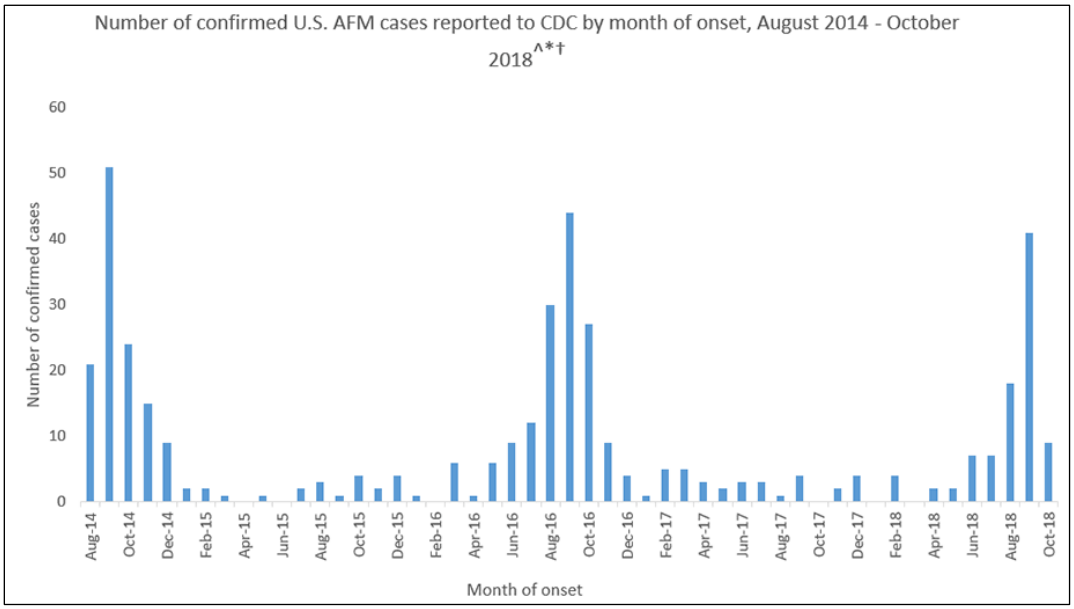
Figure 1. AFM Cases Confirmed by CDC Since August 2014



Source: Centers for Disease Control and Prevention (CDC), cases as of November 9, 2018, https://www.cdc.gov/acute-flaccid-myelitis/afm-surveillance.html.

State and Federal Roles in Disease Investigation

For AFM, disease investigation involves identifying and verifying cases (using a working case definition, explained in "National Surveillance of Infections and Diseases"), collecting detailed information about each case, and conducting laboratory and epidemiological studies to better understand the disease. Under the U.S. system of federalism, states play the lead role in identifying, reporting, and investigating diseases. The federal government—CDC in particular—provides technical and financial assistance, and often gathers and analyzes disease reports provided to it voluntarily by states. Pursuant to the Public Health Service Act (PHSA), CDC (as an agency of the Public Health Service) has broad authorities to conduct public health research, publish findings, and make recommendations; to provide assistance to state and local authorities in controlling communicable diseases; and to award grants for preventive health programs to state and local authorities. Through these authorities and others, CDC can assist localities in disease investigation, and can disseminate information, such as treatment guidelines, to a nationwide audience. Among other forms of assistance, CDC annually awards grants to all states, territories, and the District of Columbia to expand Epidemiology and Laboratory Capacity (ELC), which helps these jurisdictions address unforeseen or emerging diseases.

National Surveillance of Infections and Diseases

Through its National Notifiable Diseases Surveillance System (NNDSS), CDC works with the Council of State and Territorial Epidemiologists (CSTE) and other state and local officials to track about 120 national notifiable conditions, mostly infectious diseases and some noninfectious conditions (e.g., lead poisoning). CSTE, which represents epidemiologists acting in an official capacity for their jurisdictions, establishes and updates recommendations for the national notifiable conditions list at its annual conference. State and local authorities may then elect to mandate reporting of the nationally notifiable conditions to health departments, and then provide data to CDC. Health departments may work with health care providers and laboratories to implement reporting systems, with assistance from CDC.

AFM is not on the national notifiable conditions list; however, some states may voluntarily report AFM cases to CDC for further investigation. CDC has funded health departments to implement physician awareness programs on AFM. State and local authorities may also choose to mandate reporting of AFM cases through their own notifiable conditions list. In addition, CSTE has recently updated the case definition for AFM, which is a uniform set of criteria to define the disease for reporting purposes. To qualify as a confirmed case, the patient must have "an illness with onset of acute flaccid limb weakness" and have an "MRI showing spinal cord lesion largely restricted to gray matter and spanning one or more spinal segments." CDC reviews specimens, medical reports and notes from each reported AFM case to confirm that it meets the case definition. CSTE updates case definitions as needed, especially for emerging diseases.

How Authorities Identify the Cause of a Disease

As noted, the cause of recent AFM cases has not been determined, but health officials have begun to track and study the disease. According to CDC, health professionals can conduct laboratory analyses to determine if a given AFM case is associated with a known pathogen. While health care facilities and health departments may conduct their own laboratory assessments, health departments are encouraged to send specimens (stool samples, respiratory samples, cerebrospinal fluid, etc.) from AFM patients to CDC for investigation. CDC may use exploratory laboratory tests that are not approved for clinical diagnosis, but that may help identify a possible cause of AFM.

Scientists can also conduct epidemiological studies to determine if AFM cases are statistically associated with any known exposures or risk factors. Since AFM is rare, rigorous statistical analysis may be difficult. One analysis from an AFM cluster in Arizona in 2016 found that patient and family history of asthma was common among AFM patients. Four different epidemiological studies have shown an association between AFM and enterovirus D68, a respiratory virus; however, this result has not been confirmed by laboratory analysis. CDC conducts, funds, or otherwise supports many of these epidemiological studies.

CDC states that evidence suggests a viral cause for AFM. On November 13, CDC reported that it has established a task force of national experts, including external academic researchers, to develop a comprehensive research agenda on AFM.

Conclusion

Several senators have issued letters to CDC seeking information on what the agency is doing to facilitate the identification of AFM cases, collaborate with other federal agencies to identify the cause(s) of the illness, and help local health officials and health care providers who are managing AFM cases. These actions reflect the assistive role that CDC plays in the state and federal partnership of disease investigation.