Update on Emerging Infections: News From the Centers for Disease Control and Prevention

Commentators

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Editor's note: *This article is part of a regular series on emerging infection from the Centers for Disease Control and Prevention (CDC) and the EMERGEncy ID NET, an emergency department–based and CDC-collaborative surveillance network. Important infectious disease public health information with relevance to emergency physicians is reported. The goal of this series is to advance knowledge about communicable diseases in emergency medicine and foster cooperation between the front line of clinical medicine and public health agencies.*

Increase in Acute Flaccid Myelitis—United States, 2018

[McKay SL, Lee AD, Lopez AS, et al. Increase in acute flaccid myelitis—United States, 2018. *MMWR Morb Mortal Wkly Rep*. 2018;67:1273.]

In August 2018, the Centers for Disease Control and Prevention (CDC) noted that, compared with August 2017, there was an increased number of reports of patients having symptoms clinically compatible with acute flaccid myelitis, a rare condition characterized by rapid onset of flaccid weakness in one or more limbs and spinal cord gray matter lesions. Since 2014, CDC has conducted surveillance for acute flaccid myelitis by using a standardized case definition.[1,2] An Epi-X notice was issued on August 23, 2018, to increase clinician awareness and provide guidance for case reporting.

Patients who meet the clinical case criteria for acute flaccid myelitis, defined as acute flaccid limb weakness, are classified with the Council of State and Territorial Epidemiologists case definitions of "confirmed" (magnetic resonance imaging [MRI] with spinal cord lesion largely restricted to gray matter and spanning $\geq$1 spinal segment), "probable" (cerebrospinal fluid pleocytosis [>5 WBCs/mm^3]), or "not a case."

Among 106 patients with acute flaccid limb weakness classified during January 1 to November 2, 2018, 80 cases of acute flaccid myelitis were classified as confirmed (from 25 states), 6 as probable, and 20 as noncases. This represents a 3-fold increase in confirmed cases compared with the same period in 2017. Among confirmed cases, the median patient age was 4 years (range 7 months to 32 years; interquartile range [IQR] 2.4 to 7.6 years), 47 (59%) were male patients, and, among 65 patients with information on race available, 56 (86%) were white. During the 4 weeks preceding the onset of limb weakness, signs and symptoms consistent with a viral illness were reported for 79 patients (99%), including fever for 65 (81%), respiratory symptoms (eg, cough, rhinorrhea, congestion) for 62 (78%), and gastrointestinal symptoms (eg, vomiting, diarrhea) for 30 patients (38%) with confirmed acute flaccid myelitis. Upper-limb-only involvement was reported by 38 patients (47.5%), lower limb only by 7 (8.8%), 2 to 3 upper and lower limbs by 12 (15.0%), and all 4 limbs by 23 (28.8%). All patients with confirmed acute flaccid myelitis were hospitalized, and 47 (59%) were admitted to ICUs; no deaths have been reported.

Among 78 (98%) confirmed cases with available cerebrospinal fluid results, 65 (83%) had pleocytosis, with a median cell count of 103 cells/mm^3 (range 6 to 814 cells/mm^3; IQR 56 to 194 cells/mm^3); most had a lymphocyte predominance. Median cerebrospinal fluid protein and glucose levels were 47 mg/dL (range 8 to 289 mg/dL; IQR 37 to 62 mg/dL; normal <45 mg/dL) and 59 mg/dL (range 40 to 138 mg/dL; IQR 52 to 65 mg/dL; normal $\geq$40 mg/dL), respectively. The median interval from limb weakness to cerebrospinal fluid collection was 1 day (range 0 to 16 days; IQR 1 to 3 days). The median interval from sign or symptom onset to cerebrospinal fluid collection was 7 days (range 0 to 23 days; IQR 5 to 8 days) for respiratory illness, 4 days (range 0 to 22 days; IQR 3 to 7 days) for gastrointestinal symptoms, and 3 days (range 0 to 17 days; IQR 2 to 6 days) for fever.

CDC conducts enterovirus/rhinovirus testing for all patients meeting the clinical criteria for acute flaccid myelitis, when specimens are available. Of the 80 confirmed cases in 2018, testing was performed on a total of 125 clinical specimens from 71 patients (89%), including 21 cerebrospinal fluid, 59 upper respiratory, and 45 stool/rectal swab specimens. Among these, specimen results from 38 patients (54%) were positive by enterovirus/rhinovirus real-time reverse transcription–polymerase chain reaction testing, including 11 (29%) for enterovirus-A71, 14 (37%) for

enterovirus-D68, and 13 (34%) for other viruses, primarily from nonsterile sites. cerebrospinal fluid specimen results from 2 patients were positive. One cerebrospinal fluid specimen result was positive for enterovirus-A71; this patient also had a stool specimen result positive for enterovirus-A71. The second patient had a cerebrospinal fluid specimen result positive for enterovirus-D68; this patient also had enterovirus-D68 and parechovirus-A6 identified in a respiratory specimen. Two additional patients had more than one virus detected in a single respiratory specimen, including one with EV-D68 and echovirus 6 and one with rhinovirus-A24 and parechovirus-A6. All stool specimens had negative results for poliovirus. Among the 20 patients who did not meet the acute flaccid myelitis case definition and were classified as noncases, 1 (5%) had a positive cerebrospinal fluid specimen result (echovirus 25), 7 (35%) had positive respiratory specimen results (enterovirus-A71, rhinovirus-A24, rhinovirus-A56, rhinovirus-A90, and enterovirus/rhinovirus not typed), and 6 (30%) had positive stool or rectal swab specimen results (enterovirus-D68, enterovirus-A71, rhinovirus-A90, echovirus 9, echovirus 11, and echovirus 25).

Because some enteroviruses can cause acute flaccid limb weakness, and there was a temporal association with acute flaccid myelitis and a nationwide severe respiratory outbreak of enterovirus-D68 in 2014,[2] CDC performs enterovirus/rhinovirus testing in an effort to identify causes for acute flaccid myelitis cases. Despite a subsequent peak of acute flaccid myelitis in 2016 (https://www.cdc.gov/acute-flaccid-myelitis/afm-surveillance.html), CDC did not receive reports of large outbreaks of severe respiratory illness in 2016. Furthermore, there has been limited detection of pathogens in cerebrospinal fluid in these cases; virus identified in cerebrospinal fluid would be considered causal. Almost all patients with acute flaccid myelitis have reported signs and symptoms consistent with viral illness in the weeks preceding limb weakness. Clinical, laboratory, and epidemiologic evidence to date suggest a viral association. CDC and collaborators continue to investigate risk factors for acute flaccid myelitis and to study the causes and mechanisms of acute flaccid myelitis.

Parents and caregivers are urged to seek immediate medical care for a child who develops sudden weakness of the arms or legs. In the evaluation of a child with acute flaccid limb weakness, clinicians are advised to inquire about recent fever with or without antecedent respiratory or gastrointestinal symptoms and to collect timely specimens for viral testing, including cerebrospinal fluid, serum, respiratory, and stool specimens. Additional information for clinicians is available at https://www.cdc.gov/acute-flaccid-myelitis/hcp/index.html. Cases of patients with acute flaccid limb weakness should be reported to state and local health departments as soon as possible regardless of laboratory or MRI findings.

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REFERENCES

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COMMENTARY

[Ann Emerg Med. 2019;73:380-381.]

The above report describes that in the fall of 2018, CDC noted an increase in the number of cases of acute flaccid myelitis, which is a rare poliolike neurologic disease that primarily affects children and young adults and is associated with rapid development of flaccid weakness in one or more limbs, variable cranial nerve involvement, and gray matter lesions involving the spinal cord.[1] Given the increased incidence of this illness and the likelihood that most patients will present to an emergency department, it is critically important for emergency physicians to recognize the characteristics and implications of this disease and the need to report all suspected cases to state and local health departments.

The first case of acute flaccid myelitis was reported in 2012 in California in a child with enterovirus-D68 detected in respiratory tract specimens. In addition to the outbreak described in the above report, similar outbreaks occurred in the fall of 2014 and 2016.[2,3] Although enterovirus-D68 was the most common virus detected in respiratory samples from patients with acute flaccid myelitis, the cause has not been confirmed in most patients and it remains unclear whether this illness is related to this enterovirus, another virus, or an immunologic response to infection.[4] Although the cause of acute flaccid myelitis is still unclear, the article highlights that clinical, laboratory, and epidemiologic analyses suggest a likely viral association.

In a recent study by Elrick et al[4] of North American children receiving a diagnosis of acute flaccid myelitis, it is described as "a poorly understood syndrome" in which an accurate diagnosis can be difficult to make, given the absence of a "biomarker criterion standard for diagnosis."