8-2019

Acute Flaccid Myelitis Awareness

Olivia Ballard
Otterbein University, ballard1@otterbein.edu

Acute Flaccid Myelitis Awareness

Olivia Ballard RN, SRNA, DNP Student
Otterbein University, Westerville, Ohio

AFM Introduction

Acute Flaccid Myelitis (AFM) awareness is expanding in pediatric intensive care units (PICU) around the world. The underlying etiology and protocols of management remain unclear to many medical professionals today.

As of 2014, a correlation to the disease is associated with an enterovirus pathology. Unfortunately, its presentation can be easily missed and lead to detrimental outcomes. The paralysis seen in patients infected with Enterovirus-D68 is clinically defined as AFM, acute onset of paralysis with MRI scans showing neuron damage throughout the myelin (Cassidy, Poelman, Knoester, Van Leer-Buter, & Niesters, 2018).

As new research continues to develop, the healthcare system and the Center for Disease Control (CDC) require a sustained pursuit to cure and prevent this devasting illness from affecting the lives of innocent children.

Clinical Presentation

3 Phases of disease process

1) *Prodromal Illness*
   - Febrile illness 1-4 weeks prior to neurological symptoms
   - Mainly respiratory/GI illnesses
     - Cough
     - Congestion
     - Rhinorrhea
     - Nausea/vomiting
     - Diarrhea

2) *Acute Neurologic Injury*
   - Rapid or prolonged – nadir 4 days
   - Severity ranging from mild weakness to paralysis
   - Flaccid limb weakness with lower motor neuron disease
     - Recurrent fever
     - Myalgias
     - Flaccid paralysis or weakness of at least one limb
     - Lung weakness
     - Variable cranial nerve involvement

3) *Convalescent Phase*
   - Can range months-years
     - Residual muscle weakness/atrophy
     - Undetermined complete recovery

(Fatemi & Chakraborty, 2019)

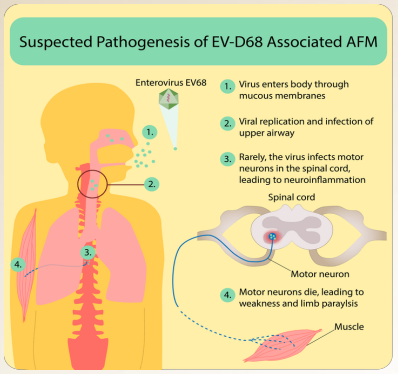
Acute Flaccid Myelitis Pathophysiology

AFM is a new, rare polio-like disease affecting the spinal cord gray matter; resulting in acute flaccid paralysis and weakness. Pathophysiology is unclear without the known cause.

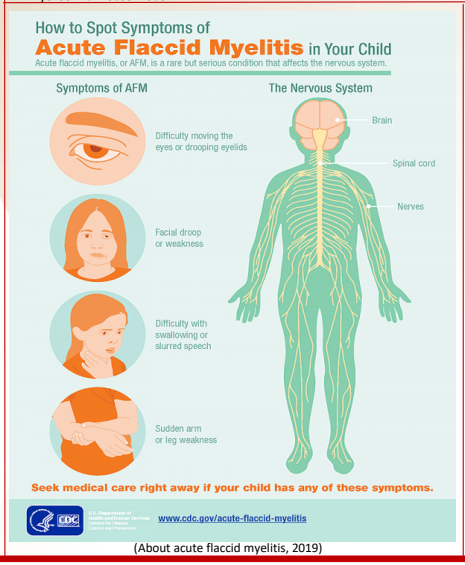
- Systemic inflammation is prevalent with spinal cord lesions starting at T2.
- The first report of the disease in 2012 with a positive test of EDV68. In the subsequent years, many new cases have been reported in the late summer and fall (Jublet, 2019)
- In most patients the etiology of AFM has not been verified, despite comprehensive lab research
- Whether the disease is a dire consequence of enterovirus D68 or other non-polio bacterial diseases or parainfectious immune responses remains uncertain (Aliabadi et al., 2016)

The correlations/significance per Up to Date (Jublet, 2019) *:*

●Enterovirus D68 was the most common virus detected in respiratory samples from children with AFM
●AFM cases clustered during periods of enterovirus D68 circulation in 2014 to 2016 and were more sporadic when enterovirus D68 was not circulating in 2015
●Enterovirus D68 was detected in the blood of one child with AFM
●Metagenomic next-generation sequencing of cerebrospinal fluid from 14 children with AFM did not find evidence of an alternative infectious cause
●Experimentally, contemporary enterovirus D68 strains cause paralytic myelitis in a mouse model



(Cabral, 2018)



(About acute flaccid myelitis, 2019)

Diagnosis

Diagnosis is difficult due to similar symptoms and presentation of other neurological diseases

- ❑ Acute onset of flaccid limb weakness
- ❑ MRI findings of brain and spinal cord with grey matter involvement
- ❑ Anterior horn cell involvement w/ spinal cord lesions at T2
- ❑ Lumbar Puncture-CSF sample
  - WBC>5u/mL
  - lymphocytic predominance
  - Variable protein levels
  - No glucose
- ❑ Respiratory PCR panel may detect enterovirus

(Hopkins, 2019, and Wang & Greenberg, 2019)

Treatment and Nursing Implications

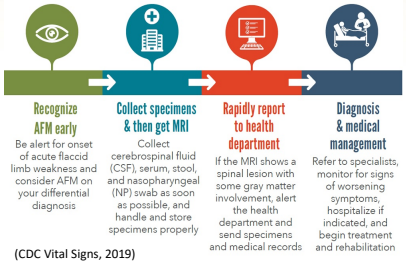
- ❍ Supportive and symptomatic management of AFM
- ❍ Management of cardiovascular, respiratory, and autonomic dysfunction depending on severity of disease
- ❍ Recommended supportive medicine includes:
  - IV corticosteroid therapy to reduce systemic inflammation
  - IV immunoglobulin (IVIG)
- ❍ Early initiation of physical and occupational therapy to prevent further weakness or contractures
- ❍ Long term treatment involves rehab and physical therapy
- ❍ Nursing
  - ❍ Must be an advocate for the patient looking for signs of AFM
  - ❍ Involvement with therapies
  - ❍ Help collect specimens and diagnostic procedures
  - ❍ Monitor for worsening symptoms

(Hopkins, 2019, and Wang & Greenberg, 2019)

Key Points

AFM is a more and more acknowledged cause of paralysis that occurs mainly in kids.

- ⇢ No definite cause of AFM
- ⇢ Enteroviruses are the most common viral association
- ⇢ Prevention is crucial
- ⇢ Early recognition, screening, and diagnosis needed for rapid treatment
- ⇢ 3 phases of disease process: Prodromal illness, acute neurological injury, convalescent phase
- ⇢ Confirmed AFM is consistent with flaccid weakness, MRI findings, and CSF samples
- ⇢ Treatment is mainly supportive and symptomatic management
- ⇢ Early therapies help prevent further weakness or deterioration
- ⇢ Nurses must monitor and advocate for patient
- ⇢ Specialists are actively seeking the cause and the means of preventing and treating AFM
- ⇢ The CDC is actively trying to prevent and treat AFM
- ⇢ Reporting suspected or confirmed cases of AFM to the CDC is one way we can help stop the reoccurrence of the rare, but devastating disease



(CDC Vital Signs, 2019)

References Cited

About acute flaccid myelitis. (2019). Retrieved from https://www.cdc.gov/acute-flaccid-myelitis/about-afm.html
Aliabadi, N., Messacar, K., Pastula, D. M., Robinson, C. C., Leshem, E., Sejvar, J. J., . . .
Dominguez, S. R. (2016). Enterovirus D68 infection in children with acute flaccid myelitis, colorado, USA, 2014. Emerging Infectious Diseases, 22(8), 1387-1394. doi:10.3201/eid2208.151949
Cassidy, H., Poelman, R., Knoester, M., Van Leer-Buter, C., C., & Niesters, H. G. M. (2018). Enterovirus D68 - the new polio? Frontiers in Microbiology, 9, 2677. doi:10.3389/fmicb.2018.02677

References cont.

Cabral, J., (2018). The replacement polio. Retrieved from http://sitn.hms.harvard.edu/flash/2018/the-replacement-polio/
CDC Vital Signs. (2019). Vital signs: acute flaccid myelitis (AFM). Retrieved from https://www.cdc.gov/vitalsigns/afm/index.html
Fatemi, Y., MD, & Chakraborty, Rana, MD, MSc, DPhil (Oxon). (2019). Acute flaccid myelitis: A clinical overview for 2019. Mayo Clinic Proceedings, 94(5), 875-881. doi://dx.doi.org.ezproxy.otterbein.edu/10.1016/j.mayocp.2019.03.011
Hopkins, S. E. (2017). Acute flaccid myelitis: Etiologic challenges, diagnostic and management considerations. Current Treatment Options in Neurology, 19(12), 48. doi:10.1007/s11940- 017-0480-3
Jublet, B. (2019). Polio and other infectious causes of acute flaccid paralysis. Retrieved from https://www-uptodate-com.ezproxy.otterbein.edu/contents/polio-and-other-infectious-causes-of-acute-flaccid-paralysis?search=acute%20flaccid%20myelitis&sectionRank=1&usage_type=default&anchor=H32712333&source=machineLearning&selectedTitle=1~10&display_rank=1#H32712333
Wang, C., & Greenberg, B. (2019). Clinical approach to pediatric transverse myelitis, neuromyelitis optica spectrum disorder and acute flaccid myelitis. Children, (5), 70. doi:10.3390/children6050070

Additional Reading Resources

About acute flaccid myelitis. (2019). Retrieved from https://www.cdc.gov/acute-flaccid-myelitis/about-afm.html
Acute flaccid myelitis. (2018). Retrieved from https://rarediseases.info.nih.gov/diseases/13142/acute-flaccid-myelitis
Morens, D. M., Folkers, G. K., & Fauci, A. S. (2019). Acute flaccid myelitis: Something old and something new. mBio, (2) doi:10.1128/mBio.00521-19
Sun, S., Bian, L., Gao, F., Du, R., Hu, Y., Fu, Y., . . . Liang, Z. (2019). A neonatal mouse model of enterovirus D68 infection induces both interstitial pneumonia and acute flaccid myelitis. Antiviral Research, 161, 108-115. doi:10.1016/j.antiviral.2018.11.013
What causes acute flaccid myelitis (2018). Retrieved from https://keepkidshealthy.com/2018/10/21/what-causes-acute-flaccid-myelitis/

OTTERBEIN UNIVERSITY