



Pediatric Clips

Infant presents with infantile botulism – Vipul Patel, MD

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Pediatric Clips from The Children's Medical Center are quick reviews of common pediatric conditions.

The Children's Medical Center is the region's pediatric referral center for a 20-county area. As the only facility in the region with a full-time commitment to pediatrics, Children's offers a wide range of services in general pediatrics as well as in 35 subspecialty areas for infants, children and teens. We welcome your inquiries about services available – call 937-641-3666 or e-mail marketing@childrensdayton.org.



All kids need special care —
All kids need Children's.

CASE: INFANT WITH BOTULISM

Emma is a 4-month-old female who was brought to The Children's Medical Center of Dayton with symptoms of viral illness and dehydration.

Emma's mother told us that Emma's 1-year-old cousin had a viral illness, which she exposed to Emma. Upon exposure to the illness, Emma gradually became fussier than normal. She would only nurse for a few minutes every day.

Emma was admitted to the pediatric floor at Dayton Children's for dehydration and viral illness. As her clinical condition continued to deteriorate,

the primary care physician decided to do a full sepsis workup.

Doctors were about to perform a lumbar puncture for a full sepsis workup when Emma stopped breathing. She was immediately given oxygen followed by chest compressions. She was transferred to the pediatric intensive care unit (PICU) for further management after stabilizing her vital signs.

Mother explained that Emma had no bowel movements for three days prior to hospitalization. On further investigation, Emma's father explained that he works on a farm with horses. He mentioned that his horses were diagnosed with white line disease in their hooves. White

line disease is caused by opportunistic microorganisms that exist in symbiotic relationship in the hooves of horses. One main destructive bacteria is *clostridia*. It can be responsible for botulism and gas gangrene.

In the PICU, Emma required ventilatory support due to poor respiratory effort. Doctors received a detailed history about the white line disease and decided to rule out *clostridium botulism* infection. A stool sample was sent to the Ohio Department of Health (ODH) in Columbus to rule out the infection.

CASE DISCUSSION:

TREATMENT

Infantile botulism was very high on the list of differential diagnoses. Doctors were able to obtain botulism immunoglobulin, an antitoxin, within 24 hours with the support of Dayton Children's pharmacy department. Emma received the botulism immunoglobulin and within five days she began to show slow improvement in her muscle tone. Emma was gradually moving all four extremities and was showing antigravity movements of her upper extremities. Emma also received probiotics, to increase *lactobacillus colonic* bacterial growth and to suppress bacterial growth of *clostridia*. The stool assay came back positive with *clostridium botulism* infection from the ODH. Emma was taken off ventilatory support seven days after receiving the botulism immunoglobulin. The

doctors at Dayton Children's continued occupational therapy and physical therapy throughout the course of hospitalization. She stayed in the hospital for approximately one month.

DISCUSSION

Infantile botulism is caused by *clostridia botulinum* spores. These spores release toxin, which is the most potent neurotoxin known to human beings. Intestinal botulism is the most common form of human botulism in the United States.

Approximately 100 cases have been reported annually in infants in the United States. Intestinal botulism occurs very rarely in older children and adults. It results from colonization and bacteria production of botulism toxin in the colon.

Principle route of exposure is through swallowing ambient *clostridium botulism* spores from soil and dust. Symptoms usually appear within 36 hours of ingestion of the spores. Anticholinergic effects of the toxin on the gastrointestinal tract account for the early symptoms of nausea, vomiting, abdominal pain and constipation. Parasympatholytic effects include decreased salivation and lacrimation. Shortly afterward, motor abnormalities appear in the distribution of cranial nerves. This early bulbar palsy leads to dysphagia, diplopia, dysarthria and, less commonly, abnormal pupillary reflexes. Generalized motor weakness progresses in descending symmetrical fashion. In severe cases, it ultimately affects the respiratory musculature resulting

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in hypoventilation and acute respiratory failure. Approximately half of the patients who have intestinal botulism require mechanical ventilation. According to the Centers for Disease Control and Prevention (CDC), cardinal features of intestinal botulism are absence of fever, normal mental status, normal or slow pulse rate, absence of numbness, paresthesias and sensory deficit. Neurological manifestation is usually symmetrical. Differential diagnosis includes sepsis, dehydration, Werdnig-Hoffmann disease, Guillain-Barre syndrome, myasthenia gravis, drug or toxin ingestion, metabolic disorders and

meningoencephalitis or myelitis. Laboratory confirmation requires detection of botulism toxin in the stool or serum by using mouse neutralization assay or isolation of toxinogenic clostridium botulinum by using stool enrichment culture techniques.

To avoid delay, treatment should be administered without awaiting laboratory confirmation. The recommended treatment is primarily supported with mechanically assisted ventilation when necessary. Prompt clinical diagnosis and treatment with botulism immunoglobu-

lin intravenously might reduce the recovery time. Botulism immunoglobulin should be requested without awaiting laboratory confirmation. All cases should be reported to local and state health departments.

FEATURED SPECIALIST



VIPUL PATEL, MD,

is a pediatric critical care specialist at Dayton Children's. Dr. Patel is board certified in pediatrics and pediatric critical care. Dr. Patel received his medical degree from B.J. Medical College, Gujarat University in India. He completed his pediatric residency at Lutheran

General Hospital in Illinois. He completed his fellowship for pediatric critical care medicine at Montefiore Medical Center/Albert Einstein College of Medicine in New York. Dr. Patel came to Dayton Children's from Mercy Children's Hospital in Toledo where he was the medical director of the department of critical care and directed pediatric transport and the pediatric advanced life support training program.

CRITICAL CARE MEDICINE

Critical care medicine provides care to patients up to age 20 years of age who are critically ill or injured. Critical care physicians can diagnose or treat conditions such as meningitis, septic shock, seizure disorder and intracranial pres-

sure. The physicians in critical care offer services in specialized monitoring, invasive intravascular/intracardiac techniques and 24-hour mobile intensive care unit - pediatric transport. The physicians are available 24 hours a day for emergency consultation. They are also available via phone to assist in the emergency stabilization of children throughout our region.

CONTACT INFORMATION

To contact Dr. Patel or to make a referral, call critical care at 937-641-5168 or e-mail Dr. Patel at patelv@childrensdayton.org.



For further information about The Children's Medical Center or its specialists contact us at 937-641-3666 or marketing@childrensdayton.org.



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