The Journal of Emergency Medicine, Vol. 45, No. 6, pp. 842–845, 2013

0736-4679/$ - see front matter

ELSEVIER

http://dx.doi.org/10.1016/j.jemermed.2013.05.017

Clinical Communications: Pediatrics

INFANTILE BOTULISM: A CASE REPORT AND REVIEW

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□ **Abstract—Background: Infantile botulism is the result of ingestion of *Clostridium botulinum* spores, and is the most common form of infection with botulism in the United States. Ninety percent of cases occur in infants <6 months old. The infants typically present with vague symptoms such as hypotonia and poor feeding. This article reports an infant with confirmed infantile botulism that presented to the Emergency Department (ED) with complaints of decreased feeding and absence of bowel movements for >1 week. Objectives: Review a case of infantile botulism, its diagnosis, and treatment. Case Report: A 4-month-old healthy Caucasian male presented to the ED with a 6-day history of decreased feeding after referral from the pediatrician. He had not had a bowel movement for 9 days, and his parents were also concerned about increasing weakness, as he was no longer able to hold his head up on his own. In the ED, he was minimally interactive. His vital signs were within normal limits, and he had hypoactive bowel sounds and decreased tone throughout. He was admitted to the Children's Hospital and eventually transferred to the Pediatric Intensive Care Unit requiring intubation and mechanical ventilation. The botulism immunoglobulin was administered, and a diagnosis was confirmed with positive botulinum toxin in the stool samples. Full recovery was made by the infant. Conclusion: Awareness of the symptoms of botulism and a high degree of clinical suspicion is needed to make a prompt diagnosis.**

□ **Keywords—infantile; botulism; *Clostridium*; botulinum**

INTRODUCTION

Infantile botulism is a rare infectious disease process, although it is the most common form of botulism infection in the United States (US). In addition, the US sees approximately 90% of the infantile botulism cases worldwide. Centers for Disease Control and Prevention statistics report an annual incidence of 110 cases in the US, with a mean age of 13 weeks. Clusters of cases have appeared in suburban eastern US cities, as well as rural and small-town western US. There are no specific risk factors; however, infants hospitalized with infantile botulism are typically born to older, educated, Caucasian mothers, have high birth weight, and are breast-fed. Infection is most commonly from ingestion of spores from *Clostridium botulinum* spores. The ingested spores then colonize the gastrointestinal tract of the infant, producing the toxin that is then absorbed.

Due to the vague nature of the presenting symptoms, infantile botulism is often misdiagnosed early in the clinical course (1). Although the prognosis of infantile botulism is excellent after the Food and Drug Administration (FDA) approval of the botulism immunoglobulin (trade name "BabyBIG") in 2003, it can have a fatal course if it is not diagnosed and treated properly (2,3). In this case, we present an infant with a typical Emergency Department (ED) presentation of infantile botulism to

RECEIVED: 24 July 2012; FINAL SUBMISSION RECEIVED: 11 December 2012;
ACCEPTED: 1 May 2013

increase physician awareness and the level of clinical suspicion for the diagnosis.

CASE PRESENTATION

A 4-month-old Caucasian boy presented to our ED after referral from his pediatrician due to concern over decreased feeding for the past 4 days. He had also had a decreased activity level, according to his mother, over that same time period. He had gone to his pediatrician's office at the start of the week for his 4-month-old well-child check-up and immunizations, and since that time he had not been acting himself. He had no previous reaction to his 2-month immunizations. His parents did report that he had been congested 2 days before his well-child check. Since his well-child check, he had consumed approximately 3–5 ounces of breast milk each day, and his normal feeding regimen was 4–5 ounces every 4 h. His mother also informed us that he was no longer latching to her breast or effectively sucking on a bottle when he attempted to feed, and that she had resorted to feeding him with a syringe. He had also had fewer wet diapers, producing a total of approximately 4 per day, as compared to his usual 10–12 wet diapers per day. His mother also complained that she felt as though her son had become very weak, and that he was no longer able to hold his head up on his own. He had not had a bowel movement in 9 days at the time of presentation, despite 2 glycerin suppositories. He had not had a fever throughout the course of the week, but he had been fussier than normal and, as a result, had been given children's Tylenol (McNEIL-PPC, Fort Washington, PA) several times, which did not seem to have any effect on him. He had been taken to his pediatrician several times throughout the week due to the parents' concerns, and it was not until the pediatrician noted generalized weakness on examination that the parents were told to bring the baby to the ED.

On examination of the infant, he was well nourished and well developed, but did seem lethargic. He was afebrile and all of his vital signs were within normal limits. He had hypoactive bowel sounds, delayed capillary refill, and generalized weakness, with no unilateral signs. Mucous membranes were slightly dry. Due to the concern for dehydration related to his decreased urine output and delayed capillary refill, he was given a 40-cc/kg bolus of intravenous (i.v.) fluids in the ED. It was noted he did not cry for the i.v. stick. An abdominal radiograph was obtained due to his constipation, however, there was no significant stool burden appreciated. The initial work-up included a hemogram with differential, a complete metabolic panel, and a C-reactive protein, all of which came back normal. A urinalysis was performed that suggested dehydration with a concentrated specific gravity and some ketones. He became slightly tachycardic, so he received several more fluid boluses and was placed on maintenance intravenous fluids. A glycerin suppository was attempted but was unsuccessful in producing a bowel movement. The infant was admitted to the Children's Hospital for dehydration, serial examinations, and monitoring of his feeding.

During his admission, he was continued on i.v. fluids, suppositories, and also began requiring occasional suctioning around this time, as he was starting to have increased secretions that were concerning to his parents. Over the next 24 h, his muscular tone continued to decrease and reflexes were no longer intact. His tongue began falling back in this throat when lying flat, causing increased work in breathing, and the patient was intubated and transferred to the Pediatric Intensive Care Unit at the end of day 2 of hospitalization. Magnetic resonance imaging (MRI) was normal, and a metabolic work-up was initiated. Neurology and Infectious Disease were consulted, and they recommended getting a lumbar puncture to rule out infection, an MRI of the spine to rule out transverse myelitis, and to begin the work-up for botulism. At the time of transfer to the Intensive Care Unit, his examination was positive for a weak cry, global hypotonia, decreased pupillary reflex, bilateral ptosis, lack of head control, and absent gag reflex. A nasoduodenal tube was placed on day 3 of hospitalization to supplement his nutritional intake, as his oral intake was still insufficient. The Intensive Care Unit attending contacted the California Department of Health regarding the infant's symptoms on day 3 of hospitalization, and he qualified for botulism immunoglobulin, which was shipped overnight and administered to the patient on day 4 of hospitalization. A stool sample was obtained using an enema and was sent to state laboratory to be tested for the *C. botulinum* toxin and culture.

At this point in the patient's work-up, the differential diagnosis was infantile botulism, transverse myelitis, Guillain-Barré syndrome, acute disseminated encephalomyelitis, or a metabolic disorder. Between days 4 and 7 of hospitalization, the patient was kept under close monitoring for signs of clinical improvement while multiple laboratory tests and imaging studies were completed to determine the correct etiology of his symptoms. The lumbar puncture was normal, making meningitis, Guillain-Barré syndrome, and acute disseminated encephalomyelitis less likely. A viral battery was completed and was negative. The MRI study of the spine was not suggestive of transverse myelitis. A large metabolic work-up was sent and was normal. On day 7 of hospitalization, results were received from the state laboratory that the stool sample collected was positive for *C. botulinum* toxin, confirming the diagnosis of infantile botulism.

On day 8, clinical improvement began to be noted with slowly improving muscular tone, first with improved