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Infant Botulism — Interior Alaska, March 2009

Introduction

On Tuesday, March 24, 2009, the Section of Epidemiology (SOE) was notified of a suspected case of infant botulism in a 6-month-old infant from Interior Alaska who was hospitalized with hypotonia and inability to feed due to weakness. We began an immediate investigation.

Case Report

The patient was a full-term, Alaska Native female who developed a febrile illness on March 5. On March 13, she was admitted with a left lower lobe pneumonia, dehydration, lethargy and poor feeding. Her mother reported that the infant had been constipated for 3 weeks prior to hospitalization. She was treated with intravenous (IV) fluids and IV Rocephin®. She was discharged to home on March 16 with improved feeding and weight gain. On March 18, her parents reported a raspy cough, decreased urine output, progressive weakness, and continued difficulty with feeding. She was re-admitted with influenza A (H1) pneumonia and neuromuscular compromise. A physical examination was significant for hypotonia. An extensive diagnostic evaluation was done, including a metabolic work up, lumbar puncture, echocardiogram, and brain magnetic resonance imaging studies which all proved to be noncontributory. Stool was collected by sterile water enema and sent to the State of California, Department of Public Health Infant Botulism Treatment and Prevention Program (IBTPP) for botulism testing. Botulinum immune globulin (BabyBIG®) was administered on March 29. The patient was discharged home on April 5 with improved feeding and steadily improving neuromuscular condition.

Investigation

We interviewed the parents for possible sources of *Clostridium botulinum* exposure and facilitated specimen collection and shipping. Clinical specimens were tested at the California State Department of Public Health Laboratory.

Results

The parents reported that the baby was primarily breast fed, but could not rule out the possibility that the infant was fed honey while at the babysitter's home. Also, carpet recently removed from a babysitter's basement was identified as a potentially significant household dust exposure.

On April 1, *C. botulinum* was demonstrated by mouse bioassay in the stool. Type A toxigenic *C. botulinum* was isolated from stool by culture on May 5.

Discussion

Infant botulism occurs globally and affects infants after the first week of life. In the United States, infant botulism is the most common form of human botulism, and approximately 80–100 cases are reported annually.^{1,2} In Alaska, four cases of infant botulism have been reported since 1982. In contrast to foodborne botulism where the pre-formed toxin is ingested, infant botulism results from ingestion of *C. botulinum* spores with subsequent intestinal colonization and toxin production. Usually, the first indication of illness is constipation followed by muscular weakness, manifested primarily as weak gag, cry, suck and swallow, loss of muscle tone, and flaccid paralysis. Affected infants often have difficulty feeding and breathing. Following appropriate treatment, patients typically recover completely from the disease. In mild cases or in the early stages of illness, the

physical signs of infant botulism may be easily overlooked. Special tests can assist in diagnosing infant botulism (Box).

Tests to Aid in the Diagnosis of Infant Botulism³

Test 1. Take the patient to a dark room. Shine a bright light into the infant's eye; note quickness of pupillary constriction. Remove the light when constriction is maximal; let the pupil dilate again. Immediately repeat, continuing for 2–3 minutes. **Findings:** The initially brisk pupillary constriction may become sluggish and unable to constrict maximally (fatigability with repetitive muscle activity is the clinical hallmark of botulism).

Test 2. Shine a bright light onto fovea, keeping it there for 1–3 minutes, even if the infant tries to deviate the eyes. **Findings:** Latent ophthalmoplegia may be elicited, and/or purposeful efforts to avoid the light may diminish. Also observe for initial squirming of the extremities that may diminish due to fatigability.

Test 3. Place a clean fifth finger in the infant's mouth, taking care not to obstruct the airway. Note the strength and duration of the reflex sucking. **Findings:** The suck is weak and poorly sustained. The gag reflex strength also may be quickly checked (if the infant has not been fed recently).

The environmental source of the *C. botulinum* spores that resulted in this infant's illness is unknown. While this is true for most cases of infant botulism, honey consumption is a known risk factor for illness, accounting for up to 15% of cases.⁴ Other possible sources include exposure to dust from inside the home and nearby construction sites.^{3,5}

This is the first infant in Alaska with confirmed infant botulism to be treated with BabyBIG®, a human-derived botulism antitoxin that shortens the length and cost of the hospital stay and the severity of illness.⁶

Recommendations

1. Health care providers that suspect infant botulism in a patient should immediately contact IBTPP at 510-231-7600 (24/7) for consultation and to obtain BabyBIG®.
2. Health care providers should instruct caregivers not to feed honey to infants aged ≤12 months.
3. Contact SOE at 907-269-8000 or 800-478-0084 (afterhours) to report suspected infant botulism and for assistance with specimen collection and shipping.

References

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