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INFECTIOUS DISORDERS

DIAGNOSIS AND TREATMENT OF INFANT BOTULISM

The clinical presentation, diagnosis, and treatment of infant botulism (IB) are reviewed by investigators at the University of California-San Francisco, CA. IB occurs between 2 weeks and 1 year of age (median 10 weeks). The incubation period is generally 3-30 days. Early signs of IB include constipation, weak cry and suck, decreased spontaneous movements, and hypotonia. Cholinergic blockade affecting the neuromuscular junction and autonomic nervous system causes a symmetric, descending motor weakness and flaccid paralysis with autonomic dysfunction that starts with the cranial nerves and progresses slowly to the trunk, extremities, and diaphragm. External ocular movements are paralyzed, pupils are fixed, corneal and gag reflexes absent or diminished, and deep tendon reflexes diminished or intact. Clinical signs vary with the severity of infection, the strain of clostridium, and neurotoxin serotype. Contaminated honey is linked to IB in 20% of cases (59% of cases in Europe). Environmental exposure to dust and soil containing botulinum spores is the most common source. The clostridial species *botulinum*, *baratii*, and *butyricum* are all recognized as causative agents, and most cases of IB are caused by botulinum toxin types A and B, type A in the western US and type B in the eastern US. Electrodiagnostic findings include normal nerve conduction, and polyphasic motor units of small amplitude and short duration on electromyography, with an incremental increase of evoked potentials on rapid repetitive nerve stimulation. An absent response to edrophonium challenge helps to exclude myasthenia gravis. Identification of botulinum toxins or organisms in stool or serum confirms the diagnosis. Therapy with human botulism immune globulin (Baby-BIG), approved by the FDA in 2003, significantly reduces hospital stay, and duration of mechanical ventilation and tube feeding. Erythematous rash in 14% of cases is the most common adverse effect. Aminoglycoside antibiotics cause neuromuscular blockade and can exacerbate paralysis due to IB; they should be avoided in treatment of secondary infection in IB. Prognosis for full recovery is usually good, even with supportive therapy alone.

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Complications include aspiration, and death from diaphragmatic paralysis. IB has been associated with sudden infant death syndrome (SIDS), accounting for 3-20% of cases in some studies. (Fox CK, Keet CA, Strober JB. Recent advances in infant botulism. **Pediatr Neurol** March 2005;32:149-154). (Respond: Dr Jonathan B Strober, Division of Child Neurology, UCSF, 500 Parnassus Ave, Box 0136, San Francisco, CA 94143).

COMMENT. Infantile botulism may mimic Guillain-Barre disease, congenital myasthenia gravis, and viral encephalitis, and unless suspected, can be difficult to diagnose. IB should be suspected, and an electromyogram ordered, in an afebrile infant who presents with feeding problems, bulbar symptoms, and paralysis. Early confirmation of the diagnosis by identification of botulinum toxin or organisms in the stool or serum, and treatment with human botulism immune globulin can decrease morbidity and the duration of hospitalization.

NEUROLOGIC SEQUELAE OF TUBERCULOUS MENINGITIS

A novel scoring system has been developed to predict neurologic sequelae (NS) in children with tuberculous meningitis, in a retrospective study of 20 cases treated during 1991-2001 at the University of California and Children's Hospital, San Diego, CA. Seven children developed severe NS and 1 child died during hospitalization. Tuberculous meningitis acute neurologic (TBAN) scores (range, 0-8) were based on weighted scores for the following: 1) mental status; 2) seizure; 3) cranial nerve abnormalities; 4) focal motor abnormalities; 5) increased muscle tone. Patients were assigned a TBAN score on day 0 and on day 3 of hospitalization. Those who had developed severe NS at 1 year follow-up had a higher score on day 0, and the difference became statistically significant by day 3 of hospitalization (5.5 versus 0.0, $P=0.02$). Sensitivity and specificity of the TBAN score (≥ 4) on day 0 (75 and 92%) and day 3 (88 and 100%) were superior to the traditional clinical staging system (Lincoln et al, 1960) on day 0 (63 and 58%), to predict severe NS. (Saitoh A, Pong A, Waecker NJ Jr et al. Prediction of neurologic sequelae in childhood tuberculous meningitis. A review of 20 cases and proposal of a novel scoring system. **Pediatr Infect Dis J** March 2005;24:207-212). (Reprints: John S Bradley MD, Division of Infectious Diseases, Children's Hospital and Health Center, San Diego, 3020 Children's Way, MC 5041, San Diego, CA 92123).

COMMENT. A novel scoring system (TBAN) employing neurologic symptoms and clinical signs, and not relying on radiologic and laboratory findings, provides an objective marker for early response to therapy and predicting severe neurologic sequelae in children with tuberculous meningitis.

The problems concerning diagnosis and treatment of TM are reviewed by researchers at the Centre for Tropical Medicine, Oxford University, UK; and Hospital for Tropical Diseases, Ho Chi Minh City, Vietnam. (Thwaites GE, Hien TT. Tuberculous meningitis: many questions, too few answers. **Lancet Neurol** March 2005;4:160-170). Subtle behavioral changes can herald the onset of TM in some children; in others, the disease presents as pyogenic bacterial meningitis, with sudden onset and polymorphonuclear cell predominance in the CSF. Basal meningeal enhancement on MRI, tuberculoma, or both, are 89% sensitive and 100% specific for the diagnosis of TM. A bacteriologic diagnosis is made in about 80% of cases, and molecular techniques (nucleic-acid-amplification assays) have added little to