



ADVANCED MEDICAL STRATEGIES
PHYSICIANS.TAKING CARE OF BUSINESS.

February 11, 2015

Upon request of SBS a medical opinion regarding the treatment provided was conducted on the above patient. Our findings are documented below:

Clinical Summary:

The patient is a two-year-old child who presented on 1/10/2014 with a one-week history of non-bilious, non-bloody emesis, and constipation.

He was seen by his pediatrician on 1/3/14, 1/7/14, and 1/9/14 due to vomiting, and initially was suspected to have gastroenteritis, but on 1/9/14 he was referred to the ED (emergency department) to exclude intussusception. He had lost two lbs (pounds) and appeared dehydrated. In the emergency department, he had a 101.4oF (Fahrenheit) fever. He had palpable stools in his abdomen. No other abnormalities on exam are reported on the accompanying records. Intussusception and appendicitis were ruled-out. He was admitted for observation, but on the morning of 1/10/14 he had a 20-minute seizure and was transferred to the PICU (pediatric intensive care unit). The cerebrospinal fluid was remarkable for a WBC (white blood cell) count of 136, RBC (red blood cells) of 38,000, a glucose of 31, and protein 233. A CT (computed tomography) scan showed mild enlargement of the ventricles and complete effacement of the cerebral sulci. An external ventricular drain was placed from 1/11/14 to 1/25/2014.

An MRI (magnetic resonance imaging) scan showed diffuse leptomeningeal enhancement and ischemic injury in both posterior cerebral artery distributions. An Infectious Diseases consultation was obtained. He underwent a work-up for infectious causes including tuberculosis, which was heavily suspected. Three separate morning gastric aspirates and a PPD (purified protein derivative) test were negative. After excluding common bacterial causes and HSV (herpes simplex virus), he was started on a four-drug anti-tuberculous therapy on 1/14/14. The CSF (cerebral spinal fluid) culture obtained on 1/11/2014 turned positive for Mycobacterium tuberculosis on 2/4/2014. He was discharged on 2/10/2014 with plans to follow-up in the Infectious Diseases clinic.

Prior to his acute illness and hospitalization, the child had a pre-travel visit to his pediatrician on 7/30/12 at almost six-months of age. He travelled to India from 8/5/2012 to 8/30/2013. Succinct records indicate he sought care in India due to cough for 2 (two) days, associated with post-tussive emesis, and was prescribed (guaifenesin) and an oral steroid. Upon return, he was diagnosed with an upper respiratory illness. He received the 18-month immunizations on 9/9/13, and influenza vaccines on 10/23/13, and 11/25/2013.

Questions:

- 1. Was the diagnosis of TB meningitis, osteomyelitis apparent prior to the effective date of 8/29/13?**
- 2. Based on clinical presentation of patient, should care have be rendered prior to effective date of 8/29/13?**

Conclusions*:

- 1. Was the diagnosis of TB meningitis, osteomyelitis apparent prior to the effective date of 8/29/13?**

No, the diagnosis of tuberculosis meningitis (TBM), osteomyelitis was not apparent prior to the effective date of 8/29/13. See rationale below.

- 2. Based on clinical presentation of patient, should care have be rendered prior to effective date of 8/29/13?**

No, based upon the clinical presentation of the patient, care should not have been rendered prior to the effective date of 8/29/13. Tuberculous (TB) meningitis has a high incidence in infants. Early diagnosis is crucial to prevent its devastating long-term sequelae, however, it is difficult because clinical features are non-specific (such as poor weight gain, low-grade fevers and listlessness or apathy) and laboratory tests are insensitive. Therefore, treatment delay is common. ^[1]

Suspicion of TB meningitis usually arises only some days or weeks after the disease's onset and is not different in children who have or have not been vaccinated with Bacille Calmette-Guerin ^[2]. This patient presented with advanced signs of the disease: elevated intracranial pressure resulting into vomiting, seizures, and ischemic changes. Occasionally TB meningitis can present acutely, with these normally late signs already apparent and without a distinct prodromal period ^[3]. Duration of symptoms for more than five-days was predictive of TB meningitis in India ^[4].

Diagnosis of probable or possible TB meningitis requires signs and symptoms of meningitis in association with clinical, CSF and cerebral imaging findings suggestive of M. tuberculosis infection. According to the attached documentation, the diagnosis of TB meningitis was not apparent prior to the effective date of 8/29/2013. Whereas the patient lived for one-year in a highly endemic area, he had no known exposure to TB contacts. His father and the maternal grandmother (one of the primary caregivers) were asymptomatic, had positive tuberculin skin tests (TST) and negative chest radiographs; his mother had negative TST. The initial symptoms of cough and post-tussive emesis were too non-specific and should not prompt further evaluation if promptly resolved, as it was the case. Therefore, specific care could not have been rendered prior to 8/29/2013.

Unfortunately, no good screening method exists, and the patient would not have demonstrated a relevantly high diagnostic score of TB meningitis ^[5]. Indeed, despite an exhaustive work-up in a tertiary care center, the diagnosis was presumptive (on the basis of a constellation of clinical findings and exclusion of other conditions) for four-weeks until culture confirmation occurred.

Reference(s):

1. Thwaites GE, van Toorn R, Schoeman J. Tuberculous meningitis: more questions, still too few answers. *Lancet Neurol.* 2013 Oct; 12(10):999-1010.
2. Khemiri M, Bagais A, Ben Becher S, Bousnina S, Bayoudh F, Mehrezi A, et al. Tuberculous meningitis in Bacille Calmette-Guerin-vaccinated children: clinical spectrum and outcome. *J Child Neurol* 2011.
3. EM Lincoln, SUR Sordillo, PA Davies. Tuberculous meningitis in children. *J Pediatr*, 57 (1960), pp. 807–823.
4. R Kumar, SN Singh, N Kohli. A diagnostic rule for tuberculous meningitis. *Arch Dis Child*, 81 (1999), pp. 221–224.
5. Principi N, Esposito S. Diagnosis and therapy of tuberculous meningitis in children. *Tuberculosis* 2012; 92:377-83.

Reviewer's Credentials

Is a medical doctor (MD) board certified in pediatrics and pediatric infectious disease. Serves as clinical assistant professor of pediatrics at a school of medicine. Currently maintains an active practice and serves as medical director for infectious diseases, and vice-chair of pediatrics, at a well-known children's hospital. Published in peer reviewed literature and books. Is active in the field of research serving as PI and in professional societies. Lectures by invitation.

**The conclusions in this report may be modified or updated if additional historical or analytical data becomes available.*

The recommendations noted are made to a reasonable degree of medical certainty. These opinions are based on the medical records and information submitted to AMS for review, Physician/clinician contractors also consider published scientific medical evidence and other relevant information such as that available through federal government agencies, institutes, and professional associations. Advanced Medical Strategies, LLC. assumes no liability for the opinions. The client authorizing this case review agrees to hold AMS harmless for any and all claims which may arise as a result of this case review. This opinion is not intended to be final interpretation of plan/policy language or determination of benefits or exclusions. Adjudication of the claim remains solely the client's responsibility.

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