Pediatric Brucellosis: A Case Study

Laura Van Winkle-Preston, DNP, RN, FNP-C,
& Michelle L. Drew, DNP, MPH, CNM, FNP, RN

KEY WORDS
Brucellosis, dairy products, farm animals, fever, pediatric

Brucellosis is a zoonotic infection that occurs readily worldwide but is rarely seen in primary care in the United States, with confirmed cases of only 100 to 200 per year. Risk factors for acquiring brucellosis infection include occupational exposures to body fluids and consumption of unpasteurized dairy products from infected animals, largely from sources outside of the United States. The following case report is of a patient who was diagnosed with brucellosis during an acute febrile illness.

Laura Van Winkle-Preston, Nurse Practitioner, The Cancer Institute of Dallas, Duncanville, TX, Doctor of Nursing Practice, Texas Woman's University, Dallas, TX.

Michelle L. Drew, Professor, Texas Woman's University, Dallas, TX.

Conflicts of interest: None to report.

Correspondence: Laura Van Winkle-Preston, DNP, RN, FNP-C, The Cancer Institute of Dallas, 310 E. Highway 67, Duncanville, TX 75137; e-mail: lauraevanwinkle@hotmail.com.

J Pediatr Health Care. (2014) *28*, 177-181.

0891-5245/$36.00

Published online September 18, 2013.

http://dx.doi.org/10.1016/j.pedhc.2013.07.013

CASE PRESENTATION

A 4-year-old Hispanic boy was brought to the office for a sick visit with his mother, who reported a 5-day history of illness including fever of up to 38°C, abdominal pain with loss of appetite, and leg pain. Although the child reported having leg pain, he continued to ambulate under his own power with no apparent difficulty. The mother had been using acetaminophen and ibuprofen to treat his fever and pain.

> Risk factors for acquiring brucellosis infection include occupational exposures to body fluids and consumption of unpasteurized dairy products from infected animals, largely from sources outside of the United States.

HISTORY OF PRESENT ILLNESS

The family had recently visited an uncle who lived on a small noncommercial farm on the Texas side of the U.S./Mexico border. Although the child had been allowed to play with and pet animals, he had not been present during the birth or slaughter of livestock. The family returned from the visit 2 days prior to the onset of the patient's illness. The mother did not recall any significant sick contacts. She also denied any recent consumption of unpasteurized dairy products or undercooked meats by the child or the family.

The patient was up to date on routine childhood immunizations, including influenza, and had not recently

received any vaccines. The patient had no significant medical history except for seasonal environmental allergies, which were treated with loratadine as needed. He had reached all age-appropriate milestones. The patient lived at home with his parents and two dogs. The mother denied the presence of illicit drugs, alcohol, cigarette smoke, or guns in the home. The family was Catholic and attended mass regularly.

REVIEW OF SYSTEMS

The review of systems revealed fevers, chills, and myalgias. The mother stated that the patient had a runny nose and a cough, but she observed no dyspnea or activity intolerance. The mother denied headache, dizziness, changes in hearing, or hearing loss. The patient reported having a stomach ache, demonstrated a decreased appetite, and had not had a bowel movement in 4 days, but his mother denied vomiting. The patient continued to urinate normally. The mother denied any rashes or changes to the patient's skin. The mother reported that although the patient had reported that his legs hurt, she believed the patient was describing body aches.

PHYSICAL EXAMINATION

At the time of the visit, the patient was in the 50% percentile for both height and weight. Pertinent positive findings during the physical examination included clear rhinorrhea, hypertrophied tonsils 2+ without exudate, a nonproductive cough, and a temperature of 37.9°C. Pertinent negative findings included lack of palpable lymph nodes and lungs that were clear to auscultation.

DIFFERENTIAL DIAGNOSIS

Based on the history and physical examination, likely differential diagnoses included viral upper respiratory infection including rhinovirus and respiratory syncytial virus, strep throat, mononucleosis, tularemia, Kawasaki disease, salmonella, seasonal influenza, and brucellosis. Strep throat was ruled out based on the physical examination and a subsequent negative throat culture. Mononucleosis was ruled out based on the blood test results. Tularemia, Q fever, and human immunodeficiency virus were ruled out later based on risk factors and blood test results. Kawasaki disease was eliminated from the differential diagnoses because of a lack of rash and swollen lymph nodes. Salmonella was ruled out because the patient did not have severe diarrhea, chills, headache, vomiting, or bloody stools.

TREATMENT PLAN

No tests were performed during the initial office visit because the patient appeared to be in only mild distress, and because the patient presented outside the window of time in which he could be treated with antiviral drugs such as amantadine or oseltamivir, he was not tested for influenza. The patient was diagnosed with a viral upper respiratory infection by the nurse practitioner.

The mother was instructed to use either acetaminophen or ibuprofen as needed for the patient's pain and fever (McIntosh & Sinaniotis, 2008). The mother was also advised to push fluids to prevent dehydration and to seek medical advice for fever of 39°C for 3 or more days or if the patient was not getting better after 10 days (Cleveland Clinic, 2013). The mother was advised to follow up in 7 to 10 days or to return to the office as needed for new or worsening symptoms such as trouble breathing, hemoptysis, confusion, or swollen lymph nodes.

Two days later, the patient and mother returned to the clinic because of persistent fever and body aches. The mother stated that the patient was worse than before and appeared concerned. At that time the child exhibited a fever of 40.1°C, a heart rate of 132 beats per minute, respirations of 28 per minute, and blood pressure of 100/60 mm Hg. However, findings of his physical examination were unchanged.

An antibiotic was prescribed to treat the persistent cough and fever and because the patient was not improving (McIntosh & Sinaniotis, 2008). An amoxicillin/clavulanate 600/42.5 mg/5 mL (Augmentin, Beecham Group [part of GlaxoSmithKline], Brentford, Middlesex, United Kingdom) suspension was prescribed at a dose of 45 mg/kg/day divided twice a day for 10 days (Hamilton, 2009). The patient was also given ceftriaxone, 1 g intramuscularly, in the office.

A chest radiograph was obtained to rule out pneumonia. Bloodwork was obtained in the office for a complete blood cell count, antinuclear antibody, C-reactive protein, febrile agglutination panel (assay panel for rickettsia, salmonella typhi species, and brucella abortus), blood culture, and throat culture. The febrile agglutination panel was ordered because of the recent travel to the Mexican border and the likelihood that the patient had been exposed to brucella based on the clinic's patient population.

FOLLOW-UP OFFICE VISIT

The patient and mother returned to the clinic for follow-up the next week. The mother reported that the patient had not had fever in 2 days, his appetite had improved, and he was feeling better. The chest radiograph was normal. Laboratory results were as follows: white blood cell count, 15,000/mm^3 (normal, 5,000-10,000/mm^3); hemoglobin, 11.5 g/dL (normal, 9.5-14 g/dL); platelets, 334,000/mm^3 (normal, 150,000-400,000/mm^3); antinuclear antibody, negative; C-reactive protein, 4.03 mg/L (normal, < 10 mg/L); and no growth for both blood and throat cultures. The febrile agglutination panel included direct fluorescent assay for rickettsia and indirect assay for salmonella typhi and brucella abortus. The rickettsia and salmonella titers were negative, but the brucella antibodies included an elevated immunoglobulin (IG) A (125) and IgG (121), and a normal IgM of 103. Based on these findings, the patient was given a presumptive diagnosis of brucellosis.