

Brucellosis

2006 Case Total 2

2005 Case Total 1

Brucellosis is a zoonotic disease that encompasses infection with one of a number of *Brucella* species, including *B. abortus*, *B. melitensis*, *B. suis*, *B. ovis*, and *B. canis*. Cattle and other bovine animals are the primary reservoir for *B. abortus*; sheep and goats are associated with *B. melitensis* and *B. ovis*; swine can harbor *B. suis*; and domestic and wild canines serve as the host for *B. canis*.

Although brucellosis rates are high in certain regions of the World such as the Mediterranean, northern Africa, and Mexico, the occurrence of human brucellosis in the United States has steadily declined coinciding with the progressive state-by-state eradication of *B. abortus* and *B. suis* from domestic cattle and swine, respectively. Nationally, the last incidence peak of the disease occurred in 1975 when more than 300 cases were reported to the CDC. For the past decade, less than 100 cases have been reported annually by all states combined. Since 1991, an average of less than one case (0.6) per year has been reported to the OSDH. In 2006, two cases of brucellosis were identified in Oklahoma. These cases are illustrative of the changing epidemiology of brucellosis where the majority of U. S. cases are now due to ingestion of unpasteurized cheese products, either imported as ethnic foods or eaten during international travel, or associated with the slaughter of feral swine.

Case #1: During early October 2006, a 52 year-old Hispanic male began experiencing intermittent fevers, loss of appetite, arthralgias, and weight loss. On December 21, 2006, he was hospitalized for intractable lower back pain (5 weeks duration) and further evaluation of lumbar diskitis and osteomyelitis accompanied by right leg weakness. *Brucella melitensis* biovar 1 was isolated from a blood culture specimen. Interview with the case patient revealed that he had been residing in the United States for 30 years but traveled to Zacatecas, Mexico in August 2006. Raw goat milk cheese was consumed during this Mexican trip.

Case #2: On April 4, 2007, a four year-old Hispanic boy was admitted to an Oklahoma hospital with severe left-sided hip pain and refusal to bear weight. He had been experiencing an intermittent fever for about 4 months. A blood culture specimen collected on April 17 grew a suspect *Brucella spp* and was forwarded to the OSDH Public Health Laboratory for speciation. The isolate was confirmed as *B. melitensis* biovar 1. The boy lived in an immigrant household, but the family did not report any recent foreign travel.

Laboratory Testing

In both 2006 cases, diagnosis was made by bacterial culture and isolation. This is the preferred method of confirmatory diagnosis because isolation of the organism allows for *Brucella* species identification and typing. If brucellosis is suspected, the laboratory should be given advance notification to ensure safe handling of specimens and to hold cultures for at least 30 days before discarding.

Polymerase chain reaction (PCR) testing is also available at the OSDH Laboratory; advance consultation is recommended before submitting specimens for PCR testing.

Serological testing to diagnose brucellosis is frequently used, but clinicians should be knowledgeable about the type of test ordered and its limitations. Almost all of the assays that are offered by commercial reference laboratories for brucellosis testing are qualitative enzyme-linked immunosorbent assays (ELISA). The ELISA test wells are coated with a *B. abortus* antigen (a smooth strain), so the presence of antibodies to other smooth strains of Brucellae (*B. melitensis* and *B. suis*) will be detected. The numerical value that is reported is not an antibody titer and cannot be evaluated for exposure timing or disease confirmation. Additionally, the commercial IgM tests are poorly specific for *Brucella spp* and frequently result in false positive results. There are no currently available tests to detect antibodies to *B. canis*, which is a rough strain.

If a positive ELISA test result is obtained, it must be evaluated in context of the patient's clinical presentation and exposure/travel history. When the whole picture is suggestive of brucellosis, serial cultures of blood, bone marrow aspirates, or tissue discharges should be attempted. During an OSDH case investigation, acute and convalescent serum specimens may be requested for forwarding to CDC for confirmation by tube agglutination testing.