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Is Human Brucellosis Endemics in Korea?

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Brucellosis is a zoonotic disease transmitted to humans by animals infected with *Brucella* species.[1] It occurs worldwide, but is especially prevalent in the Mediterranean countries of Europe, North and East Africa, the Middle East, South and Central Asia, and Central and South America.[1,2]

Brucella species are facultative intracellular bacteria consisting of aerobic gram-negative coccobacilli. Eight species of *Brucella* have been identified, including *B. melitensis*, *B. abortus*, *B. suis*, *B. canis*, *B. ovis*, *B. neotomae*, *B. ceti*, and *B. pinnipedialis*.[3] The three major pathogens causing brucellosis are *B. abortus*, *B. melitensis*, and *B. suis*.[4] In Korea, *B. abortus* is the main pathogenic species of human and bovine brucellosis.[5]

The diagnosis of brucellosis should be based on clinical manifestations, a history of exposure to infected animals and positive serology, because the symptoms of this disease are nonspecific. The most common features are fever, chills, night sweats, headache, arthralgia, and fatigue.[4,6] In a three-year follow-up study of human brucellosis in Korea, about 80.0% of patients with brucellosis complained of clinical symptoms such as chronic fatigue and arthralgia for more than three years after treatment.[7]

Many complications of systemic infections can affect organ systems.[4,6,8] Osteoarticular involvement includes spondylitis and sacroiliitis, and hematologic abnormalities are common in the course of brucellosis.[4,9] Genitourinary involvement (orchiepididymitis, glomerulonephritis, and renal abscesses), neurological involvement (meningitis, encephalitis), and pulmonary involvement (bronchitis, interstitial pneumonitis) can also occur.[4,10] Endocarditis is relatively rare, but is a serious manifestation that can lead to death.[4,11] The case fatality for brucellosis was less than 1.0% of cases.[10]

Human brucellosis has been designated as a communicable disease in Korea since 2000. The first human brucellosis case in Korea was reported in 2002. Since an outbreak of human brucellosis in Jeongeup city, Jeollabuk-do province in 2003, the incidence of brucellosis has rapidly increased throughout Korea.[12] From January 2002 to October 2015, a total of 750 brucellosis cases were reported in the "Disease Web Statistics System" of the Korea Center for Disease Control and Prevention (Fig. 1).[13] Cases of human brucellosis increased from a single patient in 2002 to 215 patients in 2006. Significantly more males are infected with human brucellosis than females (639 patients vs. 112 patients, 85.1% vs. 14.9%). The percentage distribution of human brucellosis cases by age group was as follows: ≤19, 20–39, 40–59, and over 60 age groups had 7 cases, 97 cases, 459 cases, and 188 cases, respectively. The age-specific incidence was highest in persons 40–59 years of age (61.0%). The distribution of human brucellosis by occupation was as follows: farmers, veterinarians, and other occupations represented 57.9%, 6.1%, and 30.1% of cases, respectively.[14] The greatest incidence of brucellosis occurs in Gyeongsangbuk-do province, which has a high proportion of agricultural land. In 2006, a large number of cases were reported and brucellosis emerged as an important public health issue. With aggressive eradication policies, human and bovine brucellosis showed a tendency to decrease rapidly.

Human brucellosis is usually associated with occupations involving animals. Livestock farmers are at highest risk, and veterinarians also have a high incidence. Employees in slaughterhouses and laboratory workers handling *Brucella* cultures also face an increased risk of infection.

Human brucellosis has a close relationship with the occurrence of bovine brucellosis. The highest incidence of bovine brucellosis occurs in Gyeongsangbuk-do province, where many cows are raised. Bovine brucellosis, however, has declined in Korea since 2006. The Korea Animal Health Integrated System reported 940 heads of brucellosis in 2002, 1088 heads in 2003, 5383 heads in 2004, 17690 heads in 2005, 25454 heads

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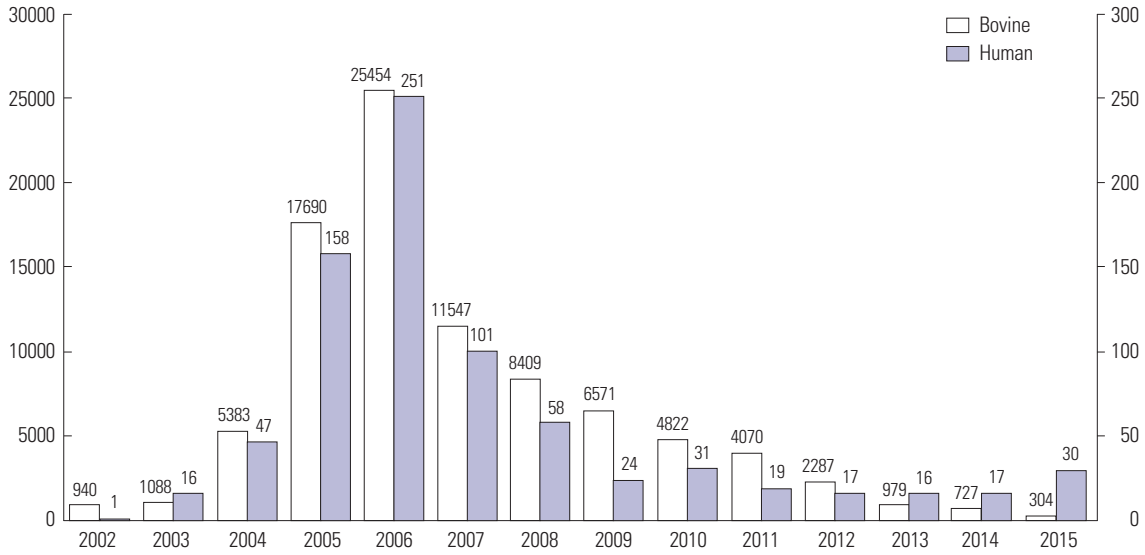

Fig. 1. The number of human and bovine brucellosis in Korea.

in 2006, 11548 heads in 2007, 8416 heads in 2008, 6571 heads in 2009, 4822 heads in 2010, 4070 heads in 2011, 2287 heads in 2012, 979 heads in 2013, 727 heads in 2014, and 304 heads from January to October 2015 (Fig. 1).[15] A strong governmental eradication policy contributed to the rapid decrease in bovine brucellosis.

After the epidemic peaked in 2006, the reported number of human brucellosis cases decreased sharply. Nevertheless, around 20 human brucellosis cases have been reported each year. Thirty cases were reported from January to October 2015, which was an increase from the previous year. If this trend continues steadily, human brucellosis could become an endemic disease in Korea.

To eradicate human and bovine brucellosis, thorough government inspections and management are needed, including quarantine. When bovine brucellosis is eradicated, human brucellosis will also disappear. A concerted effort toward brucellosis management and eradication is still needed to prevent nationwide spread of human brucellosis.

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