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SHORT REPORT

Outbreaks of brucellosis related to the consumption of unpasteurized camel milk

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Summary Brucellosis is the most frequent zoonosis reported in Qatar, mainly related to exposure to infected camels. An outbreak of human brucellosis in 14 members of a family living in a rural area in Qatar is reported herein. Clinical, epidemiological and laboratory results from all 14 patients with Brucella and 12 non-confirmed family members were collected from files. All patients reported fever for a maximum of 14 days, associated with arthralgia (6 patients), weakness (4 patients), headache (4 patients), diarrhea (2 patients) and abdominal pain (2 patients). The median age of the patients was 10 years and that of non-cases was 16 years, with a predominance of males (92.9%). Elevated levels of transaminases were observed in patients. A mixed infection caused by *Brucella abortus* and *Brucella melitensis* was identified by blood culture and serology. The source of the infection was the milk of an infected camel. The outbreak of brucellosis melitensis/abortus related to the consumption of camel milk constitutes a gap in the prevention and control of the potential sources of brucellosis in animal farms. Proper control and education of the population are required.

Introduction

Human brucellosis is the most common zoonotic disease worldwide, especially in the Mediterranean countries of Europe, North and East Africa, the Middle East, South and Central Asia and Central and

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South America [1]. Eastern Mediterranean countries have shown an incidence of more than 100 cases per 100,000 persons/year, with the highest figures in Syria, Lebanon, Iraq, Saudi Arabia, Sudan and Oman [1,2]. Qatar is considered a non-endemic country with low incidence compared to the previously mentioned countries. A decreasing trend was reported from 2004 to 2012, with the highest figure in 2006 (4.2 cases per 100,000 inhabitants) [3,4].

The epidemiological state of Brucellosis in the region has been described in several studies, but there are few reports of outbreaks [5]. Shimol et al. [6] reported an outbreak of brucellosis acquired through camel milk in 15 members of an extended family in Israel. Shaar et al. [7] described an outbreak related to the consumption of raw cheese in Lebanon. Nemenqani et al. [8] also described a cluster of six cases of breast brucellosis in Taif (Saudi Arabia). Recently published papers refer to outbreaks in Mexico, Malaysia and Greece [9—11].

A detailed description of human brucellosis in Eastern Saudi Arabia showed decreasing incidence from 1983 to 2007 [12]. A recently published paper described the clinical characteristics, laboratory findings and treatment of cases reported in Qatar from 2000 to 2006 [3]. The consumption of unpasteurized camel milk has been identified as a main source of human brucellosis in Qatar. An additional risk is associated with contact with infected animals, especially the assistance of parturition or the consumption of insufficiently cooked or raw meat [13]. Rahil et al. did not identify risk factors in 54.8% of patients reported, while in 41.7% and 12.5%, the consumption of raw milk and contact with animals, respectively, were identified as potential sources of exposure. *Brucella abortus* and *Brucella melitensis* are the etiological agents associated with camels and goats, which constitute the most important source of the disease in Qatar [14,15]. No papers about outbreaks of brucellosis have been published in Qatar.

Important risk factors for the population living in Qatar is the incidence in neighboring countries, the population dynamics in the region, and the movement of animals in the Arabian Peninsula. Here, we report an outbreak of human brucellosis in 14 members of a family living in a rural area in Qatar.

Methods

Data source

The patients and other family members were seen in the emergency department in the community hospital where the initial investigation was conducted, and the majority of the patients were admitted for additional studies. Clinical and epidemiological data included demographics, the onset of illness, clinical manifestations, and epidemiological exposure to the infected animals. The laboratory tests performed included hematologic and chemical tests, and microbiological studies included blood culture and serology for *B. abortus* and *B. melitensis*. The patients' files and laboratory records constituted the main sources of information, as well as interviews with family members about the animal sources of the disease.

Serological and bacteriological testing of blood samples were performed with care at a Biosafety Level 2, as stated in WHO guidelines [15]. Blood samples from suspected cases were cultured using the continuous-monitoring automated blood culture system BacT/ALERT 3D Biomerieux. The presumptive identification of Brucella spp. isolates was made on the basis of colony morphology, the appearance of Gram stain smears, and the results of oxidase, catalase and urea hydrolysis tests [16].

Brucella species fall into WHO Risk Group 3 (handling of cultures represents a risk to personnel in the laboratory) [15]. Biosafety level 3 facilities, practices and procedures are not available in our lab, so further testing was not possible. The identification and quantitation of specific antibodies to *B. abortus* and *B. melitensis* in sera was performed by a quantitative tube agglutination test for Brucella antibodies (Remel Brucella Agglutination Test).

Diagnostic criteria

The diagnosis of Brucellosis was made based one of the following criteria: (1) compatible clinical features including fever, sweating, chills, headache, arthralgia and malaise, supported by the detection of specific antibodies at significant titers; (2) evidence of a four-fold or greater rise in *Brucella* antibody titer between acute- and convalescent-phase serum specimens obtained greater than or equal to 2 weeks apart or the demonstration of antibody titers (>1:160) in the standard tube agglutination test (STA); and (3) Isolation of Brucella spp. in blood [14,17].

Data analysis

Data were entered in an Excel spreadsheet and analyzed in JMP 10.0 (SAS Institute). To demonstrate differences in the results of laboratory tests in cases compared with non-confirmed family members, a chi-squared test was performed. A p value below 0.05 was considered significant.