



Case report

Probable sexual transmission of brucellosis

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ABSTRACT

Brucellosis, a bacterial zoonosis, is transmitted directly or indirectly from infected animals (mainly domesticated ruminants and pigs) to humans. People are generally susceptible to brucella, which is mainly transmitted by direct contact, digestive tract and respiratory tract. Since brucella can be discharged from various secretions and feces after human infection, sexual transmission has become a potential mode of transmission. We report a case of highly suspected sexually transmitted brucellosis infection patient, which was discharged after treatment with etimicin + minocycline.

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Introduction

Brucellosis is a zoonotic infectious disease caused by invading the body and causing infection-allergy by *Brucella*. In China, it belongs to category b infectious diseases, and sheep are the main source of infection in most areas [1]. Human is the opportunistic host of this disease. Prior to onset, most of the patients had close contact with livestock and animal products suspected to be infected with brucellosis, or had eaten raw cow's, sheep's milk and meat products, or lived in brucellosis epidemic areas, or engaged in brucella culture, detection or brucella vaccine production and use [1]. As brucella is ubiquitous in the bodily fluids and feces of infected patients [2–4], sexual transmission has become a potential transmission mode of brucella. The two patients reported in this case are couples, highly suspected of sexual transmission between husband and wife.

Case presentation

In September 2019, a 46-year-old female was hospitalized at First Affiliated Hospital of Chongqing Medical University due to "recurrent fever for one month, up to 38.9 °C accompanied by chills and sweating", but otherwise no complaints. She was treated with

meroxicillin sulbactam sodium + ribavirin locally and her temperature back to normal. However, 1 week after treatment, the patient's temperature increased again, with the highest value of 39 °C.

After admission to our hospital, besides high body temperature, through laboratorial inspection, she had leucopenia and low neutrophils, slightly elevated hypersensitive C - reactive protein, procalcitonin and other inflammatory parameters (Table 1). Blood culture was positive for Gram-negative bacillus biochemically identified as *Brucella melitensis* (Fig. 1). Simultaneously, serum agglutination test was positive. The patient was treated with intravenous aminoglycoside etimicin 300 mg (once a day for 14 days) plus minocycline 100 mg (first dosage 200 mg, then once every 12 h) in combination. Her temperature rapidly returned and maintained to normal and she was discharged and continued to take minocycline for 6 months without any recurrent signs during the follow-ups.

Interestingly, the woman did not have any history of exposure to farm animals, drinking raw milk, and blood transfusion. She reported, however, that her husband, a lorry driver, had an intermittent low-grade fever prior to her illness. Her husband had ever been to Lanzhou, Gansu Province (a brucellosis outbreak occurred from vaccine factory's pollution due to failed disinfectants just during that period) and had a short stay in a farm unloading goods. The husband also presented with mild redness of the urethral orifice and complained of testicular pain. Subsequently, his blood culture also grew *Brucella melitensis* and the serum agglutination test was positive as well. He was treated with the same strategy and recovered.

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Table 1
The changes of blood image and inflammatory index in case1.

Laboratory items	09–12	09–16	09–20	09–23	09–27
WBC($10^9/L$)	2.07	2.87	2.79	3.11	2.72
N(%)	39.7	34.9	31.5	37.9	30.5
CRP (mg/L)	–	35.00	28.70	10.60	4.36
PCT(ng/L)	0.13	0.15	0.07	0.04	0.03

WBC: white blood cells; N(%):Percentage of neutrophils ; CRP (mg/L): Hypersensitive C - reactive protein; PCT (ng/L): procalcitonin.

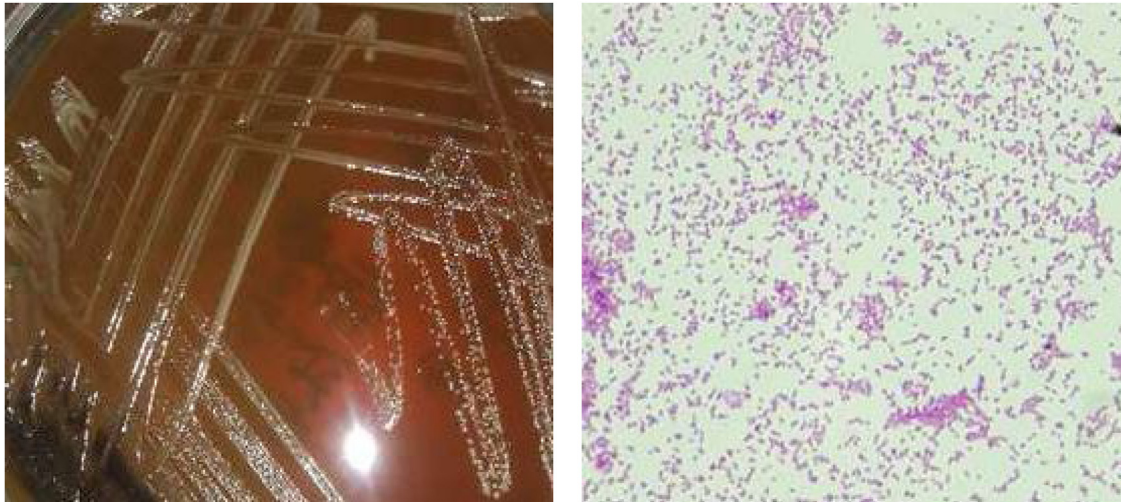


Fig. 1. Blood culture result.

Discussion

Etimicin is a new generation of synthetic aminoglycoside antibacterial drug with a wide antibacterial spectrum, strong activity, low toxicity and low adverse reactions in the same class. Minocycline is a semi-synthetic broad-spectrum tetracycline antibacterial agent. Its lipid solubility and antibacterial activity are obviously higher than other tetracycline drugs, but at the same time, due to better tissue permeability, leading to greater vestibular and ototoxicity. Compared with doxycycline recommended by WHO «Brucellosis in humans and animals» [5], minocycline has stronger antibacterial effect, but the rate of adverse reactions is relatively higher. Therefore, when minocycline is used, attention should be paid to monitor renal function, hearing and other adverse reactions. In this case, two patients were treated with etimicin (300 mg qd) combined with minocycline (100 mg q12 h) without any adverse reactions.

At present, 9 species of brucella have been confirmed, 5 of which can infect human beings. The most pathogenic and invasive species to human is brucella sheep (*B Melitensis*), followed by pig (*B Suis*), bovine (*B Abortus*) and dog (*B Canis*) [5]. Studies have identified travel history in specific areas such as Iran, Turkey, the Middle East, and foodborne infections (e.g. use of unpasteurized milk products) and animal-derived exposure as major risk factors [6]. Brucellosis has been isolated from the urine, semen, articular synovial fluid and other body fluids of patients with brucellosis [2–4], which has been confirmed by bacteriology. Previously, brucellosis mother-to-child transmission has been reported in China [7]. Foreign scholars have found cases of suspected sexually transmitted brucella infection [8]. In the case reported by Meltzer et al. in 2010, they found two cases in which

the husband had eaten unsterilized dairy products or traveled from the epidemic area. Although brucella was not found in the semen culture of the husband in both cases, both semen PCR tests were positive. In addition, one of the male patients did not have urinary tract related symptoms, so the absence of urogenital tract related symptoms in the male patient does not indicate no risk of sexual transmission. Sperm bacterial culture and prospective follow-up should be timely improved, and abstinence and other relevant preventive measures should be taken during the treatment [8].

In this case, unfortunately, no diagnostic confirmation by semen testing was done. Because no other transmission risk exposure for this wife was found, together with her husband's epidemiological history, time of onset, and urinary tract symptoms, it can be viewed as a highly suspected case of human-to-human spread of brucellosis through sexual intercourse. In the clinical diagnosis and treatment of brucellosis, we should not ignore the potential possibility of sexual transmission as a means of interpersonal transmission, pay attention to the tracing of medical history and epidemiological investigation, timely diagnosis through serology and etiology, and give reasonable anti-infection treatment.

Ethics declarations

Study ethics: The informed consent was obtained from the patient for publication of this case report.

Declaration of Competing Interest

We declare no competing interests.

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