LETTER TO THE EDITOR

Emergency response to occupational brucellosis in a pharmaceutical manufacturing enterprise

Dear Editor

We reported two consecutive outbreaks of occupational brucellosis among workers from 2013 to 2015 in a pharmaceutical manufacturing enterprise in East China and their successful responses using a hierarchical control strategy to prevent new outbreaks from an occupational health perspective.1 Dr Yoshida Bunkyo-ku, who is a medical doctor from the Medical Research Institute of the Tokyo Medical and Dental University in Japan, raised several questions from a clinical medical point of view, such as the cause of the emergency, incubation period, etiology and its detection, and treatment.2 We appreciate Dr Yoshida for the academic discussion submitted and would like to provide the following supplementary information for the case report through answering his questions.

This incident was not only caused by the lack of effective personal protection equipment (PPE) for workers, but also related to the change of raw material purchasing place where the sheep placenta was purchased from a low-prevalence area of brucellosis to a high-prevalence area, and the lack of several key occupational disease prevention measures, such as airtight conditions, disinfection and inactivation, automation of transportation process, engineering controls, and occupational health administrative controls. These causes of this emergency were confirmed through a control effect assessment after adopting a hierarchy of exposure control strategy that consists of elimination, substitution, engineering control, administrative control, and PPE.

As Dr Yoshida mentioned, the typical incubation period of human brucellosis takes 1-6 weeks.3 In this emergency, however, it is difficult to collect the information about the incubation period between exposure to the sheep placenta with Brucella bacteria and relevant symptom onset. In December 25, 2012, the pharmaceutical manufacturing enterprise changed the raw material purchasing place from a low-prevalence area of brucellosis to a high-prevalence area, and the lack of several key occupational disease prevention measures, such as airtight conditions, disinfection and inactivation, automation of transportation process, engineering controls, and occupational health administrative controls. These causes of this emergency were confirmed through a control effect assessment after adopting a hierarchy of exposure control strategy that consists of elimination, substitution, engineering control, administrative control, and PPE.

Currently, human brucellosis incidence has increased sharply in China. The nationwide surveillance data, which required by the “Infectious Diseases Prevention Law” in China, indicated that the total incidence rate of human brucellosis in mainland China increased from 0.92 cases/100,000 people in 2004 to 4.2 cases/100,000 people in 20145; The average annual growth rate reached 20.8% during 2003-2014, and it will continue to rise during the next few years.6 Human brucellosis is mainly caused by the exposure to Brucella-infected livestock, aborted materials or their products, or by consuming unpasteurized food contaminated by Brucella spp, especially milk or milk products of sheep and goats.7 Among the nine known Brucella species, Brucella melitensis is the most virulent and invasive.8 Many epidemiological
studies in China revealed that 84.5% of the 634 strains isolated from the patients with brucellosis were Brucella melitensis.9

In terms of the treatment for the brucellosis in this event, a combination of doxycycline and rifampicin served as an antibiotic regimen for the seven brucellosis patients. It is a traditional treatment strategy for human brucellosis recommended by the World Health Organization (WHO). After the anti-Brucella treatment, the patients’ clinical symptoms disappeared or were improved, indicating the traditional treatment is still effective. Dr Yoshida recommends a combination of doxycycline and streptomycin to replace the traditional treatment, which may provide a new approach to effectively treat the infectious disease.

ACKNOWLEDGMENTS

This work was sponsored by the Zhejiang Provincial Program for the Cultivation of High-level Innovative Health Talents, and supported in part by the Key Research and Development Program of Zhejiang Province of China (no. 2015C03039).

DISCLOSURE

Approval of the research protocol: N/A. Informed consent: N/A. Registry and the registration no. of the study/trial: N/A. Animal studies: N/A. Conflict of interest: There are no conflicts of interest for this article.

ORCID

Meibian Zhang https://orcid.org/0000-0002-6839-737X

Keywords

antibiotics, brucella, brucellosis, etiology, occupational health

How to cite this article: Zhang M, Yuan W, Huang H. Emergency response to occupational brucellosis in a pharmaceutical manufacturing enterprise. J Occup Health. 2019;61:261–262. https://doi.org/10.1002/1348-9585.12048