疫情報導
TAIWAN EPIDEMIOLOGY BULLETIN
December 8, 2020 Vol.36 No.23
Original Article

Laboratory-Acquired Infections And Biosafety of High Pathogenic Risk-Group 3 Bacteria

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Abstract

With the global development of research on infectious diseases and medical microbiology, the biosafety management of the risk group 3 (RG3) bacteria in the laboratory cannot be ignored. Laboratory workers and medical practitioners should have sufficient knowledge about the most frequent laboratory infection accidents, types of exposure and transmission routes, potential biosafety risks and the preventive measures of these RG3 bacteria. This article reviewed 39 articles of the laboratory-acquired infections of RG3 bacteria reported in the literature during 1961–2019 and identified 1,347 cases. Among them, the Brucella (*Brucella* spp.) is the most frequent one and constituted 56.05%, followed by *Francisella tularensis* (21.38%) and *Mycobacterium tuberculosis* (17.22%). The main routes of infection include respiratory inhalation of aerosols or spores, wound or mucosal contact, needle sticks, and animal bites. Laboratory precautions include operating the RG3 pathogens in a laboratory that meets biosafety level three or higher and wearing appropriate personal protective equipment. We recommend providing vaccination or prophylactic administration and collecting blood for serological examination and follow-up of workers who may be exposed to these pathogens.

Keywords: Risk group 3 bacteria, biosafety level, biosecurity, laboratory-acquired infections, biosafety accidents

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Received: Jun. 10, 2019
DOI: 10.6525/TEB.202012_36(23).0001
Accepted: Sep. 23, 2019