Journal of Microbiology, Immunology and Infection (2019) 52, 163–164

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Letter to the Editor

Community-acquired bacteremic pneumonia due to *Pasteurella multocida* subspecies *multocida* in a patient with poor-control diabetes mellitus

Dear Editor,

Pasteurella multocida is a facultative anaerobic Gram-negative bacteria (GNB). It is a commensal microorganism inhabiting the oropharynx of healthy domestic animals, especially dogs, mice and cats.[1] Infections in humans caused by *P. multocida* usually involve diverse soft-tissue sites, and are often linked to such animal exposure.[1] Notably, *P. multocida* could be cultured from the human respiratory tract. Pneumonia, empyema, and lung abscess were reported in patients with underlying pulmonary disease,[1,2] although this co-morbidity is not absolutely required.[3]

A 60 year-old man, with diabetes mellitus under irregular control (glycosylated hemoglobin, 8.2%), consulted our emergency department in May 5, 2017 (day 1), having 2-day spiking fever. Leukocytosis (24,550/mm^3 with 94.5% neutrophils), impaired renal function (serum creatinine concentration, 1.86 mg/dL), and high serum C-reactive protein concentration (28.9 mg/dL) were noted. Consequently, after two-set blood culture analysis was performed, the patient was admitted to intensive care unit (ICU), diagnosed with sepsis with unexplained etiology. Levofloxacin 500 mg intravenously drip (ivd) per day (after 750 mg loading) was prescribed empirically.

At ICU, the patient developed dyspnea on day 2 and received oxygen therapy with non-rebreathing mask. The chest X-ray showed a large consolidated patch over the right upper lobe and significant infiltrates over left lower lobe. Rapid urinary antigen tests for detecting *Streptococcus pneumoniae* (Binax, Portland, ME, USA) and *Legionella pneumophila* serogroup 1 (Biotest, Dreieich, Germany) showed negative results. Additionally, testing his serum immunoglobulin M against *Mycoplasma pneumoniae* and *Chlamydia pneumoniae*, and the rapid influenza diagnostic test (Directigen EZ Flu A + B, Becton Dickinson, New Jersey, USA) using throat swabs also revealed negative results. On admission day 3 his blood cultures showed Gram-negative coccobacillus. Using standard biochemical tests (positive reaction for oxidase, catalase and ornithine decarboxylase tests, indole production, nitrate reduction, while negative reaction for urease test; acid production from glucose, mannitol, sorbitol, but not from maltose and dulcitol), it was identified as *P. multocida* subsp. *multocida*. In addition, the logarithm score value of matrix-assisted laser desorption ionization-time of flight mass spectrometry (MALDI-TOF MS) and the Bruker Biotyper of this *P. multocida* isolate showed 2.08. According to the standard interpretive criteria recommended by the manufacturer, a species cutoff value is $\geq$2.000, a genus cutoff value is 1.700–1.999, and not identifiable score values is $\leq$1.699.[4] Hence, the bacteremic *P. multocida* strain was also confirmed by MALDI-TOF MS. The antimicrobial susceptibility test of this *P. multocida* isolate was performed by agar dilution method and was interpreted by the MIC breakpoints of non-Enterobacteriaceae GNB of Clinical & Laboratory Standards Institute, 2017. It was susceptible to ceftazidime, cefotaxime, imipenem, meropenem, doripenem, ciprofloxacin, levofloxacin, and tigecycline, but resistant to aminoglycosides (gentamicin and amikacin). Subsequently, meropenem 1000 mg ivd q8h was administered. He recalled that he had frequently contacted with domestic dogs, but was never bitten by any animal before this admission. A bronchoscopy study on day 7 showed no obstructive lesion within the bronchus; however, severe inflammatory change in the mucosa and moderate purulent secretion in the right-side bronchus were noted. Furthermore, the culture of expectorated sputum also showed *P. multocida* subsp. *multocida*. He received a complete

https://doi.org/10.1016/j.jmii.2017.11.006

course of meropenem 1000 mg ivd q8h for 21 days, and was discharged on day 24 without sequelae.

Primary *P. multocida* bacteremia was ever reported in two Taiwanese patients with hepatic cirrhosis in 2001. By contrast, we report the first Taiwanese case of severe community-acquired pneumonia (CAP) relevant to a bloodstream infection caused by *P. multocida*. Similar CAP cases due to *P. multocida* septicemia were reported by other authors previously.[2,3] To exclude the possibility of *P. multocida* subsp. *septica* and subsp. *gallicida*, we employed detailed biochemical tests and MALDI-TOF MS to verify the species of causative organisms. Giordano et al. observed that patients with *P. multocida* bacteremia but lacking a history of animal bite usually have at least one comorbidity,[1] as seen in this case. Literature evidence suggest that once the intranasal and/or oropharyngeal colonization by heavy *P. multocida* of hosts who frequently interacted with domestic animals, transient immune dysfunction would likely predispose them to acquire such invasive infections.[2]

In conclusion, the etiological investigations of pneumonia on the CAP patients are sometimes difficult.[1,5,6] We highlight that clinicians should perform history taking carefully for the patients interacting with domestic animals, which may be the clue of *P. multocida* infections in differential diagnosis of such CAP patients.

Conflicts of interest

All authors declare no conflicts of interest.

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Wen-Sen Lee
Fu-Lun Chen
Division of Infectious Diseases, Department of Internal Medicine, Wan Fang Hospital, Taipei Medical University, Taipei, Taiwan

Department of Internal Medicine, School of Medicine, College of Medicine, Taipei Medical University, Taipei, Taiwan

Cheng-Hui Wang
Department of Laboratory Medicine, Wan Fang Hospital, Taipei Medical University, Taipei, Taiwan

School of Medical Laboratory Science and Biotechnology, College of Medical Science and Technology, Taipei Medical University, Taipei, Taiwan

Tsong-Yih Ou
Division of Infectious Diseases, Department of Internal Medicine, Wan Fang Hospital, Taipei Medical University, Taipei, Taiwan

Department of Internal Medicine, School of Medicine, College of Medicine, Taipei Medical University, Taipei, Taiwan

Yi-Hsuan Lin
Department of Emergency Medicine, Department of Emergency and Critical Care Medicine, Wan Fang Hospital, Taipei Medical University, Taipei, Taiwan

Shio-Shin Jean*
Department of Emergency Medicine, Department of Emergency and Critical Care Medicine, Wan Fang Hospital, Taipei Medical University, Taipei, Taiwan

Department of Emergency, School of Medicine, College of Medicine, Taipei Medical University, Taipei, Taiwan

*Corresponding author. Taipei Medical University, No. 250, Wu-Xing Street, Xin-Yi District, 110, Taipei, Taiwan.
E-mail address: jeanshioshin168@gmail.com

19 August 2017
Available online 19 December 2017