J Exp Clin Med 2014;6(1):39–40

Contents lists available at ScienceDirect

Journal of Experimental and Clinical Medicine

journal homepage: http://www.jecm-online.com

LETTER TO THE EDITOR

Legionellosis-Associated Diarrhea: Impressive Clinical Image

Legionella infections are generally associated with atypical pneumonia or nonpneumonic legionellosis (Pontiac fever). Since the discovery of *Legionella pneumophila* in 1977, the family *Legionellaceae* has expanded to more than 40 species, representing more than 60 serogroups.[1] These species, such as *L. pneumophila*, are found in aquatic environments and soil. The primary transmission route into humans is inhalation of hot-water aerosol or soil contaminated with *Legionella* strains, and then these pathogens usually invade into alveolar epitheliums or macrophages of human lungs and then establish an intracellular parasitic relationship. We report the case of a patient who, after exposure to a hot-water bath, showed symptoms of a comparative bradycardia and green water-like diarrhea. We have observed that green water-like diarrhea resulted from legionellosis-associated infections, suggesting this form of diarrhea as one of the clues to diagnose this disease entity.

A 69-year-old man with a history of chronic alcohol abuse suffered from a persistent fever for approximately 1 week. He claimed that he had taken a bath using stored hot water. After he was admitted to the hospital, he was diagnosed with comparative bradycardia during his physical checkup. Furthermore, his chest radiography results revealed pulmonary infiltrates in the left lower lobe. During his hospitalization, the patient showed symptoms of green water-like diarrhea and a decreased level of consciousness; he received mechanical ventilation support because he experienced respiratory distress and hypoxemia (Figure 1A). Data derived from laboratory testing revealed elevated values in infraction- or tissue injury-associated parameters, which included creatinine phosphokinase and amino transferases. However, A/B toxin tests and cultures with stool revealed no evidence of infections by pathogens such as *Clostridium difficile*. Furthermore, results from the gram staining on an endotracheal aspirate showed this disease without any connections to pathogens including *Streptococcus pneumoniae*. However, the forms of red bacilli were imaged and recorded using Gimenez stains (Figure 1B, arrow), suggesting that *Legionella* species may associate with the pathogenesis of this disorder. Both 16S rRNA common in the genus *Legionella* and *mip* gene specific to *L. pneumophila* from the endotracheal aspirate were collected and confirmed using real-time polymerase chain reaction as previously described

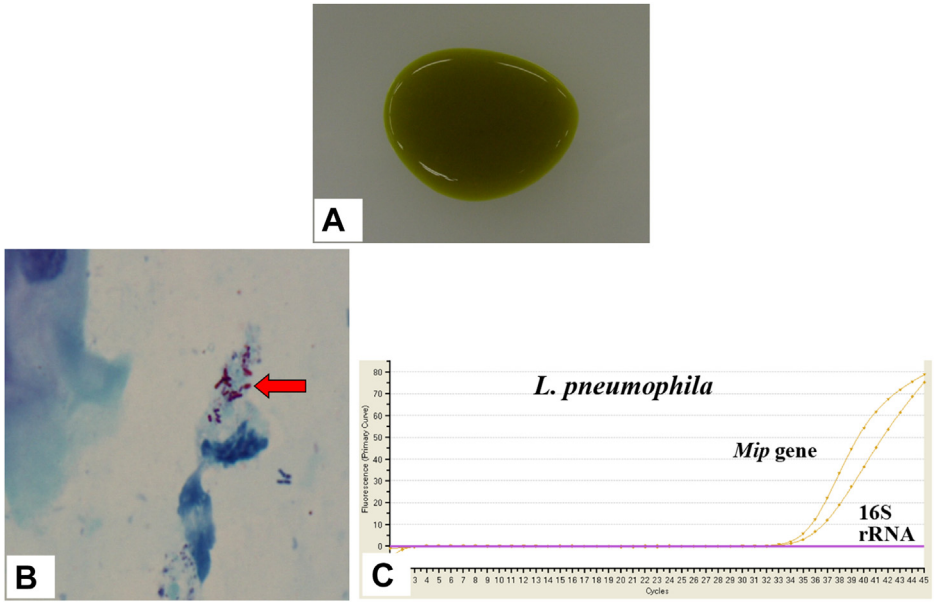

Figure 1 (A) After admission, the patient had green water-like diarrhea, with a decrease in consciousness. (B) Gimenez stains (arrow) showed red bacilli, suggesting *Legionella* species. (C) Both 16S rRNA common in the genus *Legionella* and *mip* gene specific to *Legionella pneumophila* were amplified in the endotracheal aspirate using real-time PCR.

Conflicts of interest: All authors declare no conflicts of interest.

http://dx.doi.org/10.1016/j.jecm.2014.01.006

(Figure 1C).[2,3] The positive expression of serogroup type 1 was detected in *L. pneumophila* signals using a urinary antigen test. After the diagnosis was confirmed, the patient received intravenous injections of pazufloxacin (1000 mg/d) for 14 days, and his condition improved considerably. After the clinical symptomatic features gradually disappeared—such as decreased frequency of diarrhea, fewer episodes of fever, lower inflammatory index, and reduced pulmonary infiltrates on his chest radiography—the patient was taken off ventilation support. Significant seroconversion (256-fold, indirect fluorescent antibody assay) against *L. pneumophila* serogroup 1 was positively confirmed in the convalescent phase coupled with the negative serum antibody (less than 64-fold) in the acute phase, although the *L. pneumophila* strain could not be isolated from the endotracheal aspirate. With the improvement of his condition, the patient was discharged on hospitalization day 26.

Hot-water exposure is an important factor in the diagnosis of *Legionella* pneumonia, because the pathogens can grow in hot water. However, information on exposure is not always obtained from patients/families in clinical settings. Culture-proven *Legionella micdadei* infection presenting with profound secretory diarrhea (secretion rate, up to 8 L/d) was described with a 3-cm solitary pulmonary nodule.[4] Massive diarrhea (1.8–3 L/d) in *L. micdadei* pneumonia was also reported, and this pathogen was isolated from pleural fluid with seroconversion.[5] Sixty percent of infections with nonpneumophila *Legionella* species are caused by *L. micdadei*.[6] Diarrhea is characteristic in the early course of *Legionella* infection, although the etiology is unclear. However, it seems to be secretory, without evidence of bowel wall invasion.[4] Clinicians should consider legionellosis when a patient with fever and pulmonary shadow develops diarrhea as well as comparative bradycardia. Our image concerning legionellosis-associated diarrhea appears to be instructive for clinicians.

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