

# Important Role of *C. Diphtheria* in Causing Bacteremia and Pneumonia

Lian Wang\*

Department of Medicine, Hainan Affiliated Hospital of Hainan Medical University, Haikou, China

\*Corresponding author: Lian Wang, Department of Medicine, Hainan Affiliated Hospital of Hainan Medical University, Haikou, China Email: wangli23@gmail.com

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## Description

*Corynebacterium diphtheria*, which has the potential to cause diphtheria, a tendency toward inflammatory pseudomembranous on the tonsils, and an infection of the upper respiratory tract. *C. diphtheria* infection pathogenicity was linked; it was reported, to an exo-toxin produced by the toxgene. Non-toxicogenic *C. diphtheria*, on the other hand, was said to be capable of causing a number of infections, including endocarditis, septic arthritis, and osteomyelitis. In the United States, a 23-year-old male resident with acute myelogenous leukemia was found to have infections in his bloodstream. Also, Lakshmi and others, on a routine blood culture, a similar infection was also found in an India patient with peripheral vascular disease and uncontrolled diabetes. First, we report a China-specific non-toxicogenic *C. diphtheria* bacteremia with pneumonia complications. In order to emphasize the virulence potential of this organism and to remind physicians of the essential diagnostic characteristics of a potential cause of bacteremia with pneumonia complications, the patient's clinical characteristics are detailed.

## Pneumonia and It's Symptoms

A farmer aged 69 was admitted to the emergency room of Hainan General Hospital, China, on September 18, 2019, after experiencing an unprovoked fever for two days. The minimum inhibitory concentration was used for antibiotic susceptibility testing. The patient was treated with penicillin and netilmicin because the strain was found to be susceptible to the most commonly used antibiotics—penicillin, ceftriaxone, meropenem, vancomycin, gentamicin, erythromycin, ciprofloxacin, clindamycin, rifampin, linezolid, trimethoprim/sulfamethoxazole, and ceftriaxone. The patient's symptoms worsened from day 8 to day 10, including an increasing fever and difficulty breathing. Support with a ventilator was still used to reduce acidosis, respiratory failure, and carbon dioxide retention. The minimum inhibitory concentration was used for antibiotic susceptibility testing. The patient was treated with penicillin and netilmicin because the strain was found to be susceptible to the most commonly used antibiotics—penicillin, ceftriaxone, meropenem, vancomycin, gentamicin, erythromycin, ciprofloxacin, clindamycin, rifampin, linezolid, trimethoprim/sulfamethoxazole, and ceftriaxone. The patient's symptoms worsened from day 8

to day 10, including an increasing fever and difficulty breathing. Support with a ventilator was still used to reduce acidosis, respiratory failure, and carbon dioxide retention. The patient improved on day 12 and was able to gradually be weaned off the ventilator. A nasal cannula was used to administer inhalation oxygen to the patient. On day 14, the same isolate of non-toxicogenic *C. diphtheria*, HICD201901, was also isolated for the first time from the patient's sputum.

## Bacteremia and Pneumonia Complication s Brought on by Non-Toxicogenic *C. Diphtheria* in a Healthy Individual

Even though everyone in the world has been immunized against diphtheria, it's still possible to get an invasive infection caused by *C. diphtheria*. In addition, non-toxicogenic isolates are not significantly affected by this vaccination. In recent years, there have been an increasing number of reports of *C. diphtheria* that are not toxic. *C. Diphtheria*-caused bacteremia is extremely uncommon and typically affects individuals with low immunity. This is the first case of bacteremia and pneumonia complications brought on by non-toxicogenic *C. diphtheria* in a healthy individual. After seven days of admission, it turned out that a non-toxicogenic *C. diphtheria* infection was to blame for the medical conditions. The explanation for the emergence of non-toxicogenic *C. diphtheria* is complicated due to his unknown vaccination history. He could have been infected if his immunity had waned, he hadn't been given enough vaccines, he hadn't been vaccinated as a child, or he had moved around people who hadn't been vaccinated and could have been asymptomatic carriers. As a respiratory pathogen, *C. diphtheria* can cause pulmonary infection, but it has not been reported that it can simultaneously cause bacteremia in the same patient. This case suggests that *C. diphtheria*-related bacteremia, pneumonia, and other illnesses should also be considered in healthy individuals. Clinicians should pay close attention to the onset of *C. diphtheria* infection when gram-positive isolate findings in specimens and radiological imaging indicate infection. Both clinical doubt and analysis were imperative for quick execution of disease control of *C. diphtheria*. Non-toxicogenic *C. diphtheria* can cause bacteremia and pneumonia complications, which can be fatal in this instance. Public health specialists,

microbiologists, and physicians ought to be reminded of the possibility of this infection.