Case Report

Chryseobacterium indolegenes infection in a patient with chronic obstructive pulmonary disease

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Summary

Chryseobacterium indolegenes is a rare pathogen that causes a variety of infections in individuals who are mostly hospitalized with severe underlying diseases. Here we present a case of C. indolegenes in a 69-year-old male with chronic obstructive pulmonary disease (COPD) who was admitted to the chest disease outpatient clinic with symptoms like cough, fever and sputum production and followed up on a suspicion of pneumonia. Despite the fact that our patient did not have any history of hospitalization for at least one year, pneumonia cause was due to C. indolegenes. Clinicians should pay attention to the rare pathogens such as C. indolegenes while managing COPD patients without prior hospitalization history.

Keywords: Chryseobacterium indolegenes, chronic obstructive pulmonary disease, pneumonia, multidrug resistant

1. Introduction

Chryseobacterium genus belong to Flavobacteriaceae family and it is firstly described in 1994 (1). Chryseobacterium spp. is a catalase positive, indole positive, oxidase positive, non-glucose fermenting, aerobic Gram negative bacilli. C. indolegenes is not a part of human microflora (2). It is widely distributed in nature primarily in soil and water sources. It was reported that it can survive even in chlorine-treated water, so can be a good source for healthcare associated infection (3). The infections due to C. indolegenes are mostly associated with long term hospitalization, especially in patients who are immunocompromised, using medical devices (respirators, humidifiers, intravascular catheters, intubation tubes, etc.) and subject to prolonged exposure to broad spectrum antibiotics (4,5). In this case report, we report a C. indolegenes which was isolated from a 69 year old male with chronic obstructive pulmonary disease (COPD) admitted to the hospital with cough, fever, and sputum production. Authors emphasize that C. indolegenes must be kept in mind as a cause of infection in chronic diseases like COPD.

2. Case Report

In this study, a 69-years-old male with COPD was admitted to the chest disease outpatient clinic with symptoms such as cough, fever, and sputum production and followed up on suspicion of pneumonia. The patient had no history of hospitalization at least for one year. First of all laboratory tests indicated a C-reactive protein (CRP) level of 17.71 mg/L (reference range, 0-5 mg/L) and a white blood count (WBC) of 17,600/µm³ with 77.8% neutrophils. After samples were taken for blood and sputum cultures, empirical treatment was started with imipenem and levofloxacin. Yellow-pigmented Gram negative bacilli colonies were isolated.

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from a sputum sample after 24 hours incubation in a
5% sheep blood agar. The microorganism was found
as oxidase positive and non-lactose fermenting. The
isolated bacterium was identified as C. indologenes
by VITEK2 identification and antibiogram system
(bioMerieux, Nürtingen, Germany). The strain was
found to have intermediate resistance to levofloxacin
4 µg/mL, ceftazidime-sulbactam 32 µg/mL and
resistant to ampicillin ≥ 32 µg/mL, trimethoprim-
sulfamethoxazole ≥ 320 µg/mL, cefuroxime ≥ 64
µg/mL, cefoxitin ≥ 64 µg/mL, tobramycin ≥ 16 µg/
ML, ampicillin-sulbactam ≥ 32 µg/mL, piperacillin
≥ 128 µg/mL, piperacillin-tazobactam ≥ 128 µg/
ML, ceftazidime ≥ 64 µg/mL, cefepime ≥ 64 µg/
ML, imipenem ≥ 16 µg/mL, meropenem ≥ 16 µg/
ML, amikacin ≥ 64 µg/mL, ciprofloxacin ≥ 4 µg/mL,
tetracycline ≥ 16 µg/mL, tigecycline ≥ 8 µg/mL, colistin
≥ 16 µg/mL, amoxicillin/clavulanic acid ≥ 32 µg/mL.
The clinical findings, growing of C. indologenes in
sputum culture, high serum CRP level and increased
WBC and neutrophil count lead the clinician to the
diagnosis of pneumonia. Imipenem treatment was
stopped and treatment was continued with levofloxacin
(500 mg/IV). The clinical and laboratory findings of
patient improved and there was no growth in control
cultures after 14 days of treatment.

3. Discussion

COPD is a progressive lung disease which is
characterized by airflow obstruction that is progressive
and partly reversible. It is associated with abnormal
inflammatory responses which are triggered by noxious
particles or gases. A rapid decline in clinical status of
COPD occur by exacerbations which are associated with
microbial and airway inflammation (6). According to
the Guidelines for management of COPD the impact of
exacerbations could be minimised by using appropriate
treatment with oral steroids and/or antibiotics. Up to now
no sufficient evidence is found to begin prophylactic
antibiotic therapy for managing stable COPD (7).
In the literature Haemophilus influenzae, Moraxella
catarrhalis, Streptococcus pneumoniae, Pseudomonas
aeruginosa, Klebsiella pneumoniae, Haemophilus
parainfluenzae, Serratia marcescens, Acinetobacter
ssp. are bacterial pathogens isolated from patients
experiencing exacerbation of COPD (8,9). In our case
we identified an uncommon pathogen, C. indologenes, in
our COPD patient.

The natural habitat of Chryseobacterium spp.
is water, soil, foodstuffs and plants. They are not a
part of normal human flora (4). It was reported that
C. indologenes are responsible from various clinical
conditions, such as bacteremia, sepsis, pneumonia,
shunt infection, urinary tract infection, infection of the
central nervous system (10-15). It was reported that
some underlying conditions such as indwelling devices,
malignancies, hypertension diabetes mellitus lead to
severe infections in hospitalized patients (10). Although
it is rising importance in healthcare associated
infections, there is no guideline for management of C.
indologenes infections (3,4).

Although being low-virulent, they may cause serious
infections in patients with underlying conditions such as
long term hospitalization, being immunocompromised,
use of medical devices (respirators, humidifiers,
intravascular catheters, incubation tubes, etc.) and
prolonged exposure to broad spectrum antibiotics
(5,10). Despite the fact that our patient had no history
of hospitalization for at least one year, pneumonia cause
was found to be C. indologenes.

Chryseobacterium is intrinsically resistant to
carbapenems and cephalosporins via class A beta
lactamase and class B carbapenem hydrolyzing
beta lactamase activity. According to literature C.
indologenes is frequently resistant to aminoglycosides,
chloramphenicol, linezolid, and glycopeptides and
susceptible to levofloxacin, ciprofloxacin, trimethoprim-
sulfamethoxazole and piperacillin-tazobactam (5,10). In
our case the strain was found to have intermediate
resistance to levofloxacin and sefaperazon-sulbactam
whereas it was resistant to other tested antibiotics.

In conclusion, surveillance programs are needed to
delineate the suitable antimicrobial therapy for rarely
isolated pathogens like C. indologenes and clinicians
should keep in mind the rare pathogens while managing
COPD patients without prior hospitalization history.

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