

CASE REPORT

Chryseobacterium indologenes pneumonia in a patient with non-Hodgkin's lymphomaHameed Aboobackar Shahul,¹ Mohan K Manu,¹ Aswini Kumar Mohapatra,¹ Kiran Chawla²

¹Department of Pulmonary Medicine, Kasturba Medical College, Manipal University, Manipal, Karnataka, India
²Department of Microbiology, Kasturba Medical College, Manipal University, Manipal, Karnataka, India

Correspondence to

Dr Mohan K Manu,
 manumohan73@gmail.com

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SUMMARY

A 42-year-old man diagnosed with gastric non-Hodgkin's lymphoma 2 years earlier, for which he had undergone treatment, presented with expectorative cough, exertional shortness of breath and left-sided chest pain of 3 months duration. Respiratory system examination was suggestive of left-sided pneumonia with pleural effusion. Routine haemogram showed leukocytosis with high erythrocyte sedimentation rate. Chest radiograph showed blunting of left-sided cardiophrenic angle. Sputum culture grew *Chryseobacterium indologenes*. Diagnostic thoracentesis was suggestive of lymphomatous metastasis. Pleural fluid culture was sterile. Contrast-enhanced CT (CECT) of the thorax showed left lower lobe consolidation with bilateral pleural effusion. The patient was treated with antibiotics, following which his cough improved and total leukocyte count normalised. Sputum culture repeated after the antibiotic course showed no growth of *C. indologenes*. However, the pleural effusion soon aggravated along with features suggestive of multiple metastasis. The patient finally succumbed to his underlying advanced malignancy.

BACKGROUND

Gastric non-Hodgkin's lymphoma (NHL) is a rare subtype of stomach malignancy characterised by neoplastic transformation of cells that reside predominantly within the lymphoid tissues of the stomach.¹ Chemotherapy administration and immunosuppressive treatment in patients with NHL make them more susceptible to infections. Moreover, complications that arise during the late stages necessitate the use of invasive procedures and indwelling catheters, which also add to the risk of infection. *Chryseobacterium indologenes* is a Gram-negative non-fermentative microbe found in the soil.² It is an unusual human pathogen isolated from various sources in the hospital setting. Most infections are found in hospitalised patients with underlying immunosuppression and indwelling catheters.³ Although the microbe is not very virulent, it is, nevertheless, resistant to most antimicrobial agents.⁴ We present a case of *C. indologenes* pneumonia in a patient with gastric NHL. We aim to emphasise the possibility of infections due to rare pathogens in patients with underlying malignancy and the need to detect and to aggressively treat them early for achieving favourable outcomes.

CASE PRESENTATION

A 42-year-old man presented with expectorative cough, exertional shortness of breath and left-sided,

non-radiating, non-exertional, lateralised chest pain of 3 months duration. There was no history of fever or haemoptysis. The patient was diagnosed to have gastric NHL 2 years earlier, for which he had undergone total gastrectomy, following which he was on maintenance chemotherapy. He was a non-smoker and did not consume alcohol. General physical examination was unremarkable and vital signs were normal. Respiratory system examination showed a dull percussion note and reduced breath sounds with crepitations on auscultation over the left basal areas. Except for a surgical scar over the abdomen, examination of other systems did not reveal any major abnormality.

INVESTIGATIONS

A haemogram showed low haemoglobin level (10.3 g/dL) and leukocytosis with neutrophilia. Rest of the routine investigations were normal. Chest radiograph (posteroanterior view; [figure 1](#)) showed blunting of left-sided cardiophrenic angle, suggestive of left-sided pleural effusion. Sputum culture and identification performed using a Vitek 2 system showed growth of *C. indologenes* and a drug susceptibility testing showed sensitivity to amikacin, gentamicin, piperacillin, cefoperazone-sulbactam and piperacillin-tazobactam, and resistance to cef-tazidime, quinolones, netilmicin, tobramycin, cefepime and imipenem. Sputum staining for fungus



Figure 1 Chest roentgenogram showing blunting of left-sided costophrenic angle, suggestive of left-sided pleural effusion.



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Figure 2 Contrast-enhanced CT (CECT) of the thorax showing left lower lobe consolidation (white arrow) with bilateral pleural effusion.

and Ziehl-Neelsen staining for mycobacteria were negative. Sputum culture for fungus and mycobacteria showed no growth. Pleural fluid analysis showed an exudative, lymphocyte-rich fluid with adenosine deaminase level of 17.5. Pleural fluid bacterial culture, Ziehl-Neelsen staining and fungal culture were normal. Fluid cytological analysis showed abnormal lymphocytes suggestive of malignant lymphomatous infiltration. Contrast-enhanced CT (CECT) of the thorax (figure 2) showed left lower lobe consolidation with bilateral pleural effusion. Sputum culture repeated after the antibiotic course showed no growth of *C. indologenes*. Abdominal sonography done later in the course of illness revealed abdominal lymphadenopathy with lymph nodal mass, suggestive of lymphomatous infiltration of the proximal ascending colon, gross ascites and lymphomatous infiltration of the right kidney with hydronephrosis.

TREATMENT

The patient was initially treated with amikacin and ceftazidime. Ceftazidime was stopped after 4 days and cefoperazone–sulbactam was added, once the sputum culture and sensitivity reports were available, while amikacin was continued. Antibiotics were administered for a total of 14 days. Symptomatic treatment and supportive measures were given during hospital stay.

OUTCOME AND FOLLOW-UP

The patient responded slowly to antibiotics. His cough improved and leukocytosis normalised within 14 days of starting antibiotics. Follow-up sputum bacterial culture grew normal oropharyngeal flora. However, pleural effusion soon aggravated along with features of metastasis to the kidneys, ascending colon and peritoneum. The patient finally succumbed to his underlying advanced malignancy.

DISCUSSION

Gastric NHL is a rare subtype of stomach malignancy characterised by neoplastic transformation of cells that reside predominantly within lymphoid tissues of the stomach.¹ Administration of chemotherapy and immunosuppressive agents in patients with NHL make them excessively susceptible to various forms of infection. Moreover, complications that arise during the late stages of the disease necessitate the use of invasive procedures and indwelling catheters, which also add to the risk of infection. *C. indologenes*, formerly known as *Flavobacterium indologenes*, is a Gram-negative, lactose non-fermenting, oxidase-positive, rod-shaped bacillus with a distinct yellow to orange pigment, appearing in soil, plants and water sources despite chlorination, and is often recovered from wet surfaces and water sources in hospitals.² It belongs to Centres for Disease Control group II b. It has been mostly reported to cause pneumonia or bacteraemia in

immunosuppressed adults with various malignancies and severely sick hospitalised patients.³ Although not very virulent, it is, nevertheless, resistant to most antimicrobial agents.⁴

C. indologenes-associated infection was first reported in 1993 in a patient with ventilator-associated pneumonia.⁵ Since then, *Chryseobacterium* has been reported to cause primary bacteraemia, catheter-related bacteraemia, wound sepsis, cellulitis, pyelonephritis, peritonitis, biliary tract infection, urinary tract infection, pneumonia and keratitis of the eye. Most of these infections have been related to indwelling devices, especially intravascular catheters and mechanical ventilators. Overall, only a few cases of infection with *C. indologenes* have been reported. Christakis *et al*³ in 2005 reported a case of *C. indologenes* bacteraemia not related to an indwelling catheter in a patient with a solid tumour. Bayraktar *et al*⁶ in 2007 reported *C. indologenes* isolated from blood samples from a 5-month-old infant with septicaemia. Later on, in 2011, Calderon *et al*⁷ reported a case of ventilator-associated pneumonia caused by *C. indologenes* in a newborn baby boy with congenital heart disease. Chou *et al*⁸ subsequently reported 10 patients with *C. indologenes* bacteraemia. Also, Wang *et al*⁹ reported a case of *C. indologenes* peritonitis in a patient with malignant ascites. In 2013, Afshar *et al*¹⁰ reported a case of *C. indologenes*-associated peritonitis in a patient with end-stage renal disease on peritoneal dialysis. Most patients have been treated with and have responded well to piperacillin–tazobactam.

In spite of several extensive guidelines for treating pneumonia, there are currently no specific guidelines for treating *C. indologenes* and, hence, antibiotic selection for treatment of this rare infection remains challenging. Studies suggest that most isolates of *C. indologenes* have resistance to carbapenems, aminoglycosides, chloramphenicol, tetracyclines, macrolides, linezolid and vancomycin. According to the SENTRY Antimicrobial Surveillance Program, the most effective drugs against *C. indologenes* are the quinolones (levofloxacin, gatifloxacin, garenoxacin, around 95% susceptibility), trimethoprim–sulfamethoxazole (95% susceptibility) and piperacillin–tazobactam (90% susceptibility). Alternative effective agents are ciprofloxacin, piperacillin, ceftipime, ceftazidime and rifampicin (85% susceptibility).⁴ Hence, clinicians should use antimicrobial susceptibility testing in order to ensure definitive and appropriate treatment of *C. indologenes*-associated infections.

Despite their rare prevalence, the incidence of *C. indologenes*-associated infections has been increasing around the world. Increased prevalence of healthcare-associated *C. indologenes* infections may be related to frequent exposure to broad-spectrum antibiotics, such as colistin and tigecycline.¹¹ We report a case of *C. indologenes* pneumonia in a patient with gastric NHL. Our

Learning points

- ▶ Patients who are immunosuppressed and severely sick hospitalised patients are prone to infections by rare organisms including *Chryseobacterium indologenes*.
- ▶ It is mandatory for clinicians to use antimicrobial drug susceptibility testing in suspected cases and modify antibiotic therapy based on the results.
- ▶ Infections due to *C. indologenes* are on the rise.
- ▶ *C. indologenes* may be resistant to commonly used broad-spectrum antibiotics. Hence prompt identification and targeted therapy is essential.

case demonstrates the importance of considering rare causative agents of pneumonia such as *C. indologenes* in immunosuppressed and seriously ill patients. *C. indologenes* may be resistant to commonly used broad-spectrum antibiotics and prompt antimicrobial susceptibility testing ensures successful treatment.

Competing interests None.

Patient consent Obtained.

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