

Renata de Souza Ferreira<sup>1</sup>, Fabiana Ferreira Barbosa Brandão<sup>2</sup>, Suzana Margareth Lobo<sup>3</sup>

## *Chryseobacterium indologenes* infection: a case report

*Infecção por Chryseobacterium indologenes: relato de um caso*

1. Resident of Intensive Care Medicine - Faculdade de Medicina de São José do Rio Preto – FAMERP – São José do Rio Preto (SP), Brazil.
2. Resident of Intensive Care Medicine - Faculdade de Medicina de São José do Rio Preto – FAMERP – São José do Rio Preto (SP), Brazil.
3. PhD, Professor of Internal Medicine - Faculdade de Medicina de São José do Rio Preto – FAMERP – São José do Rio Preto (SP), Brazil.

### ABSTRACT

We report a case of *Chryseobacterium indologenes* infection. The agent was isolated from the tracheal aspirate in a patient on prolonged mechanical ventilation. Epidemiological, microbiological and therapeutic aspects are discussed. The patient was a 30 years-old male, admitted with idiopathic medullary aplasia and febrile neutropenia, referred to the intensive care

unit with severe bronchopneumonia and sepsis of pulmonary origin. Most of the previously reported *Chryseobacterium indologenes* infection cases were associated with severe diseases and polymicrobial infections. The antibiotic treatment for *Chryseobacterium infections* is not yet established.

**Keywords:** *Chryseobacterium*; Cross infection; Sepsis; Neutropenia; Case reports

Received from Faculdade de Medicina de São José do Rio Preto – FAMERP – São José do Rio Preto (SP), Brazil.

Submitted on December 2<sup>nd</sup>, 2009  
Accepted on March 12, 2010

#### Author for correspondence:

Suzana Margareth Lobo  
Faculdade de Medicina de São José do Rio Preto  
Hospital de Base Intensive Care Unit and Sepsis Laboratory  
Avenida Brigadeiro Faria Lima, 5544  
CEP: 15090-000 – São Jose do Rio Preto (SP), Brazil.  
Email: suzanalobo@yahoo.com

### INTRODUCTION

The genus *Chryseobacterium* encompasses six species previously called *Flavobacterium*. These are aerobic, gram-negative, non-fermenting, oxydase-positive bacilli.<sup>(1)</sup>

*Chryseobacterium indologenes* is found in the soil, plants, food, sweet and salt and potable water. In the hospital environment is found in the water systems, equipments surface and wet medical devices (such as ventilators, tubes, and humidifiers, among others).<sup>(2)</sup>

In 1993 the first *Chryseobacterium indologenes* strain was isolated from the tracheal aspirate of a patient with ventilator-associated pneumonia, although this organism pathogenicity was not clear. Nevertheless, it is already known that biofilm and proteases production are important mechanisms involved in the pathogenesis.<sup>(3)</sup> *Chryseobacterium* species rarely cause disease in humans.<sup>(4)</sup> However, sparse cases reports are reported both in children and adults.<sup>(1,4-10)</sup> The associated infections involve the blood stream, pneumonia, intra-abdominal and surgical wounds<sup>(5,8-10)</sup> and the main comorbidities are diabetes mellitus and oncological diseases.<sup>(2,3)</sup>

This case report is from a in-patient (January to March 2009) from the ICU of the Hospital de Base de São José do Rio Preto - Faculdade de Medicina de São José do Rio Preto. An informed consent form signature was not requested as personal information will not be identified.

## CASE REPORT

A Caucasian 30 years-old male patient was admitted in the hospital on January 13, 2009 diagnosed idiopathic medullary aplasia and febrile neutropenia. He had high fever not resolved with antipyretics followed by dizziness and dyspnea. He had no cough, expectoration, or other symptoms related to the gastrointestinal or genitourinary tracts. The physical examination identified that the patient was conscious, oriented, with normal cardiopulmonary and abdominal examinations.

Laboratory tests: hemoglobin 7.2 g/dL; hematocrit = 21%; leucocytes = 900; platelets 4,000; sodium = 135 mEq/L; potassium = 3.6 mEq/L; C-reactive protein = 10.9 mg/dL. Negative urine culture, and two blood cultures with cephepime-sensitive *Escherichia coli*. Imagery tests, abdomen ultrasound, chest computed tomography and echocardiogram failed to show pathologic alterations. Initial empirical antibiotic therapy was started with ceftazidime and amikacin.

In the 3<sup>th</sup> day in the hospital ward, blood cultures guided treatment with cephepime was started replacing the previous scheme of antimicrobial therapy. The patient remained febrile and non-responding to the therapy. In the 34<sup>th</sup> hospital day anti-lymphocytic immunoglobulin (ALG) was started.

In the 40<sup>th</sup> day of hospitalization the patient was referred to the intensive care unit (ICU) due to acute respiratory failure. Severe worsening of the pulmonary infiltrates were noticed. Vancomycin, imipenem and anphotericin B were started after admission in the ICU. Despite the treatment, pulmonary infiltrates and respiratory function deteriorated needing mechanical ventilation after 3 days in the ICU. Tracheal aspirate was collected, growing *Chryseobacterium indologenes* sensitive to cephepime, ceftazidime, ciprofloxacin, and sulphamethoxazole-trimethoprim, being then restarted cephepime. At the same time a blood culture was positive for *Candida krusei*, and therapy with voriconazole was started.

In the ICU the patient remained on mechanical ventilation for a long period. On the 55<sup>th</sup> day of hospitalization, while on progressive weaning from mechanical ventilation, he presented a sudden massive enterorrhagia followed by refractory shock and death.

## DISCUSSION

Most of *Chryseobacterium indologenes* infections are related to invasive devices during hospital stay.<sup>(1)</sup> In

this patient, this was a hospital-acquired pneumonia. The best choice of an antimicrobial agent to treat a *Chryseobacterium indologenes* nosocomial infection is questionable, and for several reasons the antimicrobial therapy effectiveness is also difficult to evaluate. First, the cutoff point for an appropriate minimal inhibitory concentration (MIC) for defining *Chryseobacterium indologenes* sensitivity/resistance was not approved by the National Committee for Clinical Laboratory Standards (NCCLS). Second, almost the entire penicillins, first and second generation cephalosporins and aminoglycosides have been proven to have weak *in vitro* activity against *Chryseobacterium* spp. (including *Chryseobacterium indologenes*).<sup>(1)</sup> According to the SENTRY Antimicrobial Surveillance Program results, the best agents against *C. indologenes* are quinolones (gatifloxacin and levofloxacin) and sulphamethoxazole-trimethoprim ( $\geq 95\%$  sensitivity), followed by piperacillin-tazobactam (90% sensitivity). Ciprofloxacin, cephepime, ceftazidime, piperacillin and rifampicin were shown to have reasonable activity against this agent (85% sensitivity).<sup>(2,5)</sup> Third, there are reports of discrepancies between the agar test dilution standard and the disc diffusion are routinely used for testing *Chryseobacterium* spp sensitivity to several antimicrobials prescribed.<sup>(1)</sup> In this case, disc diffusion antimicrobial sensitivity testing was performed.

In this case, the option for cefepime was based on the antibiogram as there were reports of more than 80% of the isolates to be sensitive to this drug.<sup>(2)</sup> Nevertheless, the response to the chosen therapy was difficult to evaluate, as the patient concomitantly had fungal blood stream infection. Enterorrhagia and hypovolemic shock were the cause of death. Most of the reported cases of *Chryseobacterium indologenes* infections occurred in association with critical diseases and polymicrobial infections what complicates the evaluation of the adequacy and appropriateness of the antimicrobial therapy used against this agent..

## CONCLUSION

The majority of the cases reported in the literature with infections caused by *chryseobacterium indologenes* had critical diseases and, frequently, polymicrobial infections. Microbiological and epidemiological studies are warranted to clear the clinical importance of this agent in the chronic critically ill patient.

---

## RESUMO

Relatamos um caso de infecção por *Chryseobacterium indologenes*, presente na cultura de aspirado traqueal em paciente sob ventilação mecânica invasiva, revisando os aspectos epidemiológicos, microbiológicos e o tratamento na unidade de terapia intensiva. Paciente do sexo masculino, 30 anos, internado com quadro de aplasia de medula idiopática e neutropenia

febril foi transferido para a unidade de terapia intensiva com quadro de broncopneumonia e sepse grave de origem pulmonar. A maioria dos casos já relatados de pacientes com infecção por *Chryseobacterium indologenes* apresentavam patologias graves associadas e infecções polimicrobianas que podem dificultar a interpretação da efetividade da terapia antimicrobiana contra este agente.

**Descritores:** *Chryseobacterium*; Infecção hospitalar; Sepse; Neutropenia febril; Relatos de casos

---

## REFERENCES

1. Hsueh PR, Teng LJ, Yang PC, Ho SW, Hsieh WC, Luh KT. Increasing incidence of nosocomial *Chryseobacterium indologenes* infections in Taiwan. *Eur J Clin Microbiol Infect Dis*. 1997;16(8):568-74.
2. Sakurada Z A. [*Chryseobacterium indologenes*]. *Rev Chilena Infectol*. 2008;25(6):446. Spanish.
3. Hsueh PR, Teng LJ, Ho SW, Hsieh WC, Luh KT. Clinical and microbiological characteristics of *Flavobacterium indologenes* infections associated with indwelling devices. *J Clin Microbiol*. 1996; 34(8):1908-13.
4. Douvoyiannis M, Kalyoussef S, Philip G, Mayers MM. *Chryseobacterium indologenes* bacteremia in an infant. *Int J Infect Dis*. 2009 Sep 1. [Epub ahead of print].
5. Christakis GB, Perlorentzou SP, Chalkiopolou I, Athanasiou A, Legakis NJ. *Chryseobacterium indologenes* non-catheter-related bacteremia in a patient with a solid tumor. *J Clin Microbiol*. 2005;43(4):2021-3.
6. Cascio A, Stassi G, Costa GB, Crisafulli G, Rulli I, Ruggieri C, Iaria C. *Chryseobacterium indologenes* bacteraemia in a diabetic child. *J Med Microbiol*. 2005;54(Pt 7):677-80.
7. Al-Tatari H, Asmar BI, Ang JY. Lumboperitoneal shunt infection due to *Chryseobacterium indologenes*. *Pediatr Infect Dis J*. 2007;26(7):657-9.
8. Sibellas F, Mohammedi I, Illinger J, Lina G, Robert D. [*Chryseobacterium indologenes* bacteremia in a patient with systemic corticosteroid therapy]. *Ann Fr Anesth Reanim*. 2007;26(10):887-9. French.
9. Reynaud I, Chanteperdrix V, Broux C, Pavese P, Croizé J, Maurin M, et al. [A severe form of *Chryseobacterium indologenes* pneumonia in an immunocompetent patient]. *Med Mal Infect*. 2007;37(11):762-4. French.
10. Lin JT, Wang WS, Yen CC, Liu JH, Chiou TJ, Yang MH, et al. *Chryseobacterium indologenes* bacteremia in a bone marrow transplant recipient with chronic graft-versus-host disease. *Scand J Infect Dis*. 2003;35(11-12):882-3.