Chryseobacterium indologenes Non-Catheter-Related Bacteremia in a Patient with a Solid Tumor

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A case of non-catheter-related bacteremia caused by Chryseobacterium indologenes in a nonneutropenic man with a solid tumor is described. The patient was successfully treated with piperacillin-tazobactam.

CASE REPORT

A man, aged 54, with squamous cell carcinoma of the right nasal tube and multiple metastases in the regional cervical lymph nodes was admitted in May 2004 to the Metaxa Anticancer Hospital because of severe mass hemorrhage and the inability to swallow. In October 2003 the primary lesion and the regional lymph nodes were excised in another hospital. Between these two hospital visits, the patient had received chemotherapy and regional radiotherapy. Because of the severe hemorrhage, regional hemostatic radiotherapy was administered and the patient was fed through a gastrostomy. In addition, he received chemotherapy (methotrexate and gemcitabine) on a weekly basis for a month. The patient remained in stable condition.

On day 46, while in remission with a normal white blood cell count (7 × 109 cells/liter), the patient developed rigors and a temperature of 39°C. No source of infection was clinically apparent. Laboratory investigation revealed a white blood cell count of 22 × 109/liter (84% granulocytes, 9% lymphocytes, and 7% monocytes), a hemoglobin level of 7.9 g/dl, a platelet count of 116 × 109/liter, a γ-glutamyl transpeptidase level of 215 IU/liter, and an alkaline phosphatase level of 169 IU/liter. All of the remaining biochemical laboratory tests were unremarkable. Chest X ray as well as a computed tomography scan of the brain, chest, and abdomen showed no findings of infection. Urine, wound, and blood cultures obtained through a Hickman catheter were negative. However, blood cultures obtained through a peripheral venous site grew a gram-negative rod, later identified as Chryseobacterium indologenes. The patient was treated with piperacillin-tazobactam (4.5 g every 8 h intravenously) for 10 days. The fever resolved 4 days later.

There was no evidence of relapse during the next month, when the regional lymph nodes was admitted in May 2004 to the Metaxa Anticancer Hospital because of severe mass hemorrhage and the inability to swallow. In October 2003 the primary lesion and the regional lymph nodes were excised in another hospital. Between these two hospital visits, the patient had received chemotherapy and regional radiotherapy. Because of the severe hemorrhage, regional hemostatic radiotherapy was administered and the patient was fed through a gastrostomy. In addition, he received chemotherapy (methotrexate and gemcitabine) on a weekly basis for a month. The patient remained in stable condition.

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Chryseobacterium indologenes is the most pathogenic member of the genus, C. meningosepticum.

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indologenes is the species most commonly reported to cause different clinical syndromes usually associated with various indwelling devices (6, 16).

Chryseobacteria are not a part of the human flora but are found in soil, plants, and foodstuffs (16). In the hospital environment, these organisms exist in water systems and on wet surfaces of medical tools and equipment (10, 16). Chryseobacteria represent only 0.03% of all bacterial isolates collected by the SENTRY Program during the period 1997 to 2001, and they are responsible for 0.03% of all bloodstream infections (8). Chryseobacteria are of low pathogenicity. The production of biofilm on foreign materials and protease activity may play an important role in the virulence of invasive infections due to C. indologenes (5, 13).

Infections by C. indologenes affect mainly patients from Taiwan. To date, 38 cases have been reported in that country (6, 9, 10). Conversely, only two cases in Australia (7), one case in the United States (4), and three cases in Europe (2, 12, 15) have been described. Intra-abdominal infections, primary or catheter-related bacteremia, and wound sepsis are the most common clinical syndromes in Taiwan, while malignancies and diabetes mellitus are the main underlying diseases. Approximately half of the patients developed nosocomial infections associated with various indwelling devices, whereas three of the five (14%) fatal cases involved polymicrobial infections. Therapy does not usually require removal of an indwelling device (6).

The choice of an effective drug for empirical treatment of infections due to Chryseobacterium spp. is sometimes difficult. According to the results of the SENTRY Antimicrobial Surveillance Program, the most active agents against C. indologenes are the quinolones (garenoxacin, gatifloxacin, and levofloxacin) and trimethoprim-sulfamethoxazole (≥95% susceptibility), followed by piperacillin-tazobactam (90% susceptibility). Ciprofloxacin, ceftazidime, and rifampin showed reasonable activity (85% susceptibility). On the contrary, aminoglycosides, other β-lactams, chloramphenicol, linezolid, and glycopeptides are not appropriate for treating infections due to this organism (8). Clinical microbiologists have two additional problems to resolve: (i) susceptibility disk diffusion testing is inaccurate for chryseobacteria (1, 3) and (ii) the MIC breakpoints for these organisms have not been established by the NCCLS (11).

In conclusion, this case shows that C. indologenes should be added to the list of agents that cause severe infections. Although the majority of C. indologenes infections are linked to the use of indwelling devices during a hospital stay, non-catheter-related bacteremia may also occur. In these patients, wound infections and cellulitis are the most common portals of entry of the organism into the circulation. Although C. indologenes is widely distributed in hospital environments, the source of infection in the majority of infections remains unknown. It is likely that the establishment of an infection requires the presence of the following factors: the production of a biofilm on foreign materials, a suitable portal of entry, and immunodeficiency. When significant infections due to C. indologenes are encountered, susceptibility testing by a broth microdilution technique is necessary. Piperacillin-tazobactam may appear to be promising for treatment of severe infections due to this organism.

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REFERENCES
14. Perola, O., T. Nousiainen, S. Suomalainen, S. Aukle, U.-M. Karkkainen, J. FIG. 1. Yellow-pigmented colonies of C. indologenes in peptone medium. The yellow color, due to the production of flexirubin, turns to red after the culture is poured on 10% KOH solution.

