Nonresolving Pneumonia Due to Klebsiella oxytoca: An Unusual Presentation

The genus Klebsiella comprises nonmotile bacteria grouped on the basis of biochemical reactions. The species Klebsiella oxytoca has been identified by use of DNA hybridization assays and can be differentiated from Klebsiella pneumoniae by its inability to produce indole from tryptophan [1]. We describe an unusual case of nonresolving pneumonia caused by K. oxytoca.

An 82-year-old previously healthy woman was referred for investigation of a 9-month history of fever, weight loss, and cough productive of copious yellowish sputum. She denied any hemoptysis, night sweats, or history of tuberculosis. She had a 30-pack-year history of tobacco use. On examination, auscultation revealed dullness over the left lung base with decreased breath sounds; there were no added sounds. Other than for a low-grade fever, the findings of the remainder of her examination were unremarkable.

A complete blood count showed the following values: hemoglobin, 120 g/L; WBC count, 7.1 × 10⁹/L; and platelet count, 317 × 10⁹/L. A sputum culture yielded normal upper respiratory tract flora. Serology for antibodies to HIV was negative, and serum Ig levels were normal. A chest radiograph showed extensive consolidation of the left lower lobe (LLL) of the lung with volume loss.

High resolution CT (HRCT) of the lungs revealed air-space disease of the LLL with volume loss and patchy air-space disease of the right lower lobe (RLL) in the context of emphysematous changes. No bronchiectasis was identified.

Before referral to our institution, the patient had completed a 1-week course of clarithromycin, 500 mg twice daily. Because she did not respond to this antimicrobial regimen, flexible fiberoptic bronchoscopy (FFB) was performed and showed a welling up of yellowish sticky purulent secretions from the LLL and RLL in the absence of an endobronchial lesion. Culture of the bronchoalveolar lavage (BAL) specimen obtained from the LLL yielded K. oxytoca. The organism was identified by use of the VITEK GNI card (bio-Mérieux Vitek, Hazelwood, MO). Susceptibility testing, performed by use of disk diffusion according to the approved standard of the National Committee for Clinical Laboratory Standards [2], showed that the organism was resistant to ampicillin and susceptible to cefazolin, cefuroxime, and gentamicin. Examination of the BAL and bronchial brushing specimens did not show any malignant cells, and cultures were negative for mycobacteria and fungi.

The patient was treated initially with parenteral cefuroxime, 750 mg q8h for 10 days, followed by, oral cefuroxime axetil, 500 mg q12h for 3 weeks. Four weeks later, her symptoms recurred, and repeated chest radiography, HRCT of the lungs, and FFB did not reveal significant changes. Culture of a BAL specimen again yielded K. oxytoca, which was susceptible to tobramycin and ciprofloxacin and immediately resistant to cefazolin and cefuroxime. A treatment regimen of oral ciprofloxacin, 500 mg q12h, was commenced for 8 weeks. During this period, her symptoms slowly abated, and her appetite slowly improved (weight gain, 10 lb), and radiological studies demonstrated significant improvement.

References

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Three weeks after completing her course of ciprofloxacin, the patient’s symptoms recurred together with a new complaint of small hemoptyses. This necessitated reinstitution of prolonged suppressive ciprofloxacin therapy, 500 mg once daily, with subsequent improvement in her clinical condition.

Primary infections caused by *Klebsiella* species are uncommon, but the organism is an important cause of nosocomial and community-acquired infections [3]. Among 196 episodes of bacteremia due to *Klebsiella* species over a decade, 13% were due to *K. oxytoca* [4]. This organism is of definite pathogenic significance in patients with acute lower respiratory tract infections [5, 6]. It has been reported that *K. oxytoca* precipitates acute exacerbations of chronic obstructive pulmonary disease; there are radiological changes consisting of multiple nodular opacities resembling metastatic carcinoma [7]. In addition, hypersensitivity pneumonitis has been described in relation to exposure to *K. oxytoca* contaminating an ultrasonic, cold-air home humidifier (humidifier lung) [8].

Although acute bacterial infections have been attributed to *K. oxytoca*, in the case we describe, cultures of BAL specimens obtained from a patient with emphysema and nonresolving pneumonia repeatedly yielded *K. oxytoca*. Given the presence of emphysematous changes, we believe that in our case there was chronic colonization due to abnormal defense mechanisms. To our knowledge, this unusual presentation of infection due to *K. oxytoca* has not been reported previously in the literature. The isolation of this organism should not preclude further workups undertaken in an effort to determine the etiology of nonresolving pneumonia. Nevertheless, in patients with chronic lung disease, pneumonia secondary to *K. oxytoca* should alert physicians to the possibility of a chronic clinical course.

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References

Evaluation of the Computer Program GIDEON for the Diagnosis of Fever in Patients Admitted to a Medical Service

The clinical utility of computer-based diagnostic systems has been evaluated for general [1–4] and specialized medical problems. Diagnoses generated by the Global Infectious Disease and Epidemiology Network (GIDEON) (Update 96-3, C. Y. Informatics, Ramat Hasharon, Israel), a computer program with an extensive infectious-disease database that uses Bayes’ theorem, were compared prospectively with those of medical house officers. Inclusion criteria were: (1) age, ≥ 18 years; (2) inpatient medical service admission at the Harrison Avenue Campus, Boston Medical Center; and (3) presence of a fever (temperature, ≥ 38°C) within 24 hours of hospitalization.

From September 1996 to January 1997, records of consecutive febrile patients were reviewed. One hundred admissions (96 patients; 48 male, 48 female) met the inclusion criteria. Fourteen admissions were excluded from the analysis because the fever was either noninfectious or of unknown cause. Forty-one patients were known or thought likely to be immunosuppressed. Thirty-six patients were HIV positive; 23 met Centers for Disease Control and Prevention (CDC) criteria for AIDS.

Inpatient records were reviewed by using a worksheet containing 118 questions present in the GIDEON diagnostic module. The

| Table 1. Summary of diagnostic accuracy of GIDEON vs. house officers. |
|---------------------------------|----------------|----------------|
|                                  | All patients  | Immunocompetent | Immunosuppressed |
| Diagnoses                        |               | patients        | patients         |
|                                  | (n = 86)      | (n = 48)        | (n = 38)         |
| House officers GIDEON            | 75 (87)       | 45 (94)         | 30 (79)          |
| (first diagnosis)                | 28 (33)       | 22 (46)         | 6 (16)           |
| GIDEON (top five diagnoses)      | 31 (36)       | 24 (50)         | 7 (18)           |
| Guided* (first diagnosis)        | 52 (60)       | 35 (73)         | 18 (47)          |
| Guided* (top five diagnoses)     | 59 (69)       | 38 (79)         | 22 (58)          |

* In guided use of the GIDEON diagnostic module, clearly irrelevant clinical findings were not entered into GIDEON as positive results.