Case Report

Overwhelming Pneumococcal Pneumonia in a Patient Receiving Ofloxacin for Antimicrobial Prophylaxis

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A case of severe bacteremic pneumococcal pneumonia which developed in a patient with lung cancer, who was taking ofloxacin for chemoprophylaxis, is presented. Pneumonia resolved well with intravenous penicillin G. Infection by and colonization with *Streptococcus pneumoniae* might become a problem with increasing use of the fluoroquinolones.

Key words: Pneumococcal pneumonia, Bacteremia, Ofloxacin, Prophylaxis

The fluoroquinolones including norfloxacin, ofloxacin, enoxacin and ciprofloxacin have a broad spectrum of activity against gram-negative and gram-positive bacteria and are currently being investigated as to their efficacy in the treatment of lower respiratory infections (1-3). The new quinolones are also used for prophylaxis of bacterial infections in patients with granulocytopenia because they eliminate the aerobic gram-negative flora of the gastrointestinal tract while preserving the anaerobic flora. However, the quinolones have been reported to be ineffective for prevention of gram-positive infections, caused mainly by streptococci and coagulase-negative staphylococci (4, 5).

We describe herein a case in which severe bacteremic pneumococcal pneumonia developed while a patient was receiving ofloxacin as a prophylactic antimicrobial agent. Infection with fluoroquinolone-resistant organisms might become a problem as this class of antimicrobial becomes more widely used in various clinical settings.

CASE REPORT

A 61-year-old man was diagnosed as having squamous cell carcinoma of the lung in December 1987. He initially received three cycles of cisplatin, ifosfamide and vinblastine, with achievement of a partial response. Because of disease progression, the

patient was treated with two cycles of combination chemotherapy (cisplatin, 5-fluorouracil and vindesine) combined with radiotherapy but the response was poor. On April 20, 1988, he received another course of combination chemotherapy consisting of adriamycin, mitomycin C and vindesine. Ofloxacin (100 mg, tid) was prescribed because he was expected to be granulocytopenic. Naproxen was also given for left chest pain caused by bone metastasis. On May 2, 1988, the white cell count was 1200/cu mm with 60% neutrophils. Two weeks later, the white cell count had increased to 4800/cu mm with 67% neutrophils. Chest x-ray film was unremarkable except for tumor lesions. Ofloxacin and naproxen were continued.

On May 24, 1988, the patient was admitted because of dyspnea and wheezing. Physical examination revealed an acutely ill man with a temperature of 36.6°C, blood pressure 68/48 mmHg and a respiratory rate of 42 per minute. Chest auscultation revealed crackles over the left lung. The white cell count was 7500/cu mm with 90% neutrophils. Arterial blood gas levels while the patient was breathing one liter per minute oxygen by nasal prongs were pH, 7.45; PaCO₂, 32 mmHg and PaO₂, 35 mmHg. Chest x-ray film (Fig. 1) revealed alveolar infiltrates in the entire left lung and patchy infiltrates in the right lung. Erythromycin, clinda-

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Received for publication May 29, 1989; Accepted for publication November 13, 1989

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Fig. 1. Chest roentgenogram taken on day of admission shows bilateral alveolar infiltrates.

mycin and ceftazidime were begun. Because the patient was still hypoxemic (PaO_2 , 35 mm Hg) while receiving 100 percent oxygen by face mask, he was intubated and put on a ventilator with a positive end-expiratory pressure of 10 cm H_2O . Two days after admission, *S. pneumoniae* grew from a blood culture. Antibiotic regimen was switched to penicillin G and ceftriaxone which was discontinued four days later. Subsequent chest x-ray films showed progressive bilateral improvement.

Although he was eventually weaned from a ventilator, his subsequent hospital course was complicated by tumor progression and pneumonia caused by *Pseudomonas aeruginosa*, and he died on the sixty-second hospital day.

DISCUSSION

Bacterial infections remain a serious complication in cancer patients, especially during periods of granulocytopenia. One approach to preventing bacterial infections in the granulocytopenic patient is the use of oral antibiotics that suppress the endogenous gastrointestinal flora. The fluoroquinolones are currently being studied for this purpose because of a broad spectrum of activity against gram-negative bacilli including *Pseudomonas aeruginosa* and preservation of the anaerobic gastrointestinal flora. However, the increased incidence of gram-positive infections, mostly caused by streptococci and coagulase-negative staphylococci

has been noted among patients receiving the fluoroquinolones for prophylaxis (4, 5). *S. pneumoniae* bacteremia developed in a patient taking norfloxacin for chemoprophylaxis although the presence of pneumonia was not mentioned (4). Our patient experienced severe bacteremic pneumococcal pneumonia while receiving ofloxacin for antimicrobial prophylaxis. *S. pneumoniae* is one of the major pathogens causing bacteremia with a high mortality rate in cancer patients (6). Whether the wide use of the fluoroquinolones for chemoprophylaxis will increase pneumococcal infection must be monitored closely.

The new quinolones are also being investigated in the treatment of lower respiratory tract infections because of their broad spectrum activity against most important respiratory pathogens and their good penetration into bronchial secretions. Although one drawback of the fluoroquinolones is that their in vitro activity against *S. pneumoniae* is marginal, their efficacy in the treatment of pneumococcal pneumonia has been fairly good in reported studies (1, 2). However, failure to eradicate *S. pneumoniae* has been reported (3). It is recommended that fluoroquinolones should not be used in the treatment of lower respiratory tract infections when *S. pneumoniae* is considered to be the most likely pathogen (3). Our case report supports this recommendation because ofloxacin cannot prevent pneumococcal infection.

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