Despite few data to guide practice, no well-stated clinical guidelines, and the lack of approval by the US Federal Drug Administration for the practice, nearly 1 of every 5 physicians surveyed here used ceftriaxone for the treatment of early-stage syphilis. The physicians queried were by definition specialists in infectious diseases; therefore, this response may overestimate national practice. Nonetheless, it cannot be ignored, particularly since specialists often initiate practices that are eventually adopted by generalists.

It is curious that so many clinicians chose to use ceftriaxone, because patients requiring therapy had or were suspected to have penicillin allergy. Allergic cross-reactions between β-lactam antibiotics can occur. It is estimated that 3%–7% of patients with a history of penicillin allergy may have reactions to cephalosporins [9]. Ceftriaxone might justifiably be considered a useful alternative to penicillin for the penicillin-allergic pregnant patient, for whom alternatives do not exist. Unfortunately, the few studies of ceftriaxone for the treatment of syphilis that have been conducted thus far did not include pregnant women, and its use for this population cannot be recommended. The search for alternatives to penicillin is warranted, although declining rates of syphilis may make this a difficult task [10]. Ideally, ceftriaxone should be examined if only because so many clinicians are choosing to use it.

Michael Augenbraun and Kim Workowski

1SUNY Health Science Center at Brooklyn, New York; and 2Guidelines Unit, Epidemiology and Surveillance Branch, Division of STD Prevention, National Center for HIV, STD and TB Prevention, Centers for Disease Control and Prevention, Atlanta, Georgia

References

Bacteremia Due to Dietzia maris in an Immunocompromised Patient

Dietzia maris has been isolated from soil and the skin and intestinal tract of carp [1, 2] but has not yet been implicated in human disease. To our knowledge, we report the first case associating D. maris bacteremia with the presence of a catheter in an immunocompromised patient presenting with septic shock and pneumothorax.

A 38-year-old man was admitted to the Department of Pneumology of the Léannec University Hospital (Nantes, France) with thoracic pain and fever. His medical history was remarkable for pulmonary arterial hypertension secondary to postembolic chronic pulmonary heart with a reduced cardiac index (2.5 L/[min·m²]). He had postsmoking chronic obstructive pulmonary disease. A catheter implanted in 1995 for continuous

infusion of prostacyclin (an acute vasodilator) was left in place until 1998, while the patient was awaiting pulmonary transplantation. At admission, a chest radiograph showed pneumothorax. The patient developed septic shock with fever (40°C) and a pleural reaction after the second pleural aspiration. Two culture flasks of peripheral blood obtained from a set of specimens were incubated.

Laboratory evaluation showed a white blood cell count of 23.0 × 10³/L (80% neutrophils) and an elevated C-reactive protein level of 643 mg/L. One aerobic blood culture was positive in 3 days. Gram staining of a smear revealed gram-positive rods resembling diphtheroids. Subcultures on 6% horse blood agar yielded orange-pigmented colonies of a coryneform organism after 48 h of incubation at 37°C under aerobic conditions. The strain was susceptible to β-lactam agents, aminoglycosides, macrolides, pristinamycin, rifampin, trimethoprim-sulfamethoxazole, and vancomycin (determined by disk diffusion testing with Mueller-Hinton agar). Pleural fluid remained sterile. Respiratory samples, such as bronchial aspirate and bronchoalveolar lavage fluid specimens, were not obtained because of the poor clinical status of the patient.

Combination therapy with pristinamycin (3000 mg/d) and
penicillin V (1 million U/d) was administered, but pristinamycin treatment was discontinued after 3 weeks. One month after treatment was initiated, the WBC count was 12.0 × 10⁹/L (62% neutrophils), and the C-reactive protein level was 120 mg/L, treatment was discontinued after 3 weeks. One month after which decreased to 53 mg/L after 2 months of antibiotic treat-
tment was initiated, the WBC count was (62%912.0

Table 1. Phenotypic characteristics differentiating Dietzia maris from some other pigmented aerobic actinomycetes.

<table>
<thead>
<tr>
<th>Cell morphology</th>
<th>Acid-fast staining</th>
<th>Mycolic acids (no. of carbons)</th>
<th>Colony type</th>
<th>Pigmentation</th>
<th>Aerial hyphae</th>
</tr>
</thead>
<tbody>
<tr>
<td>D. maris</td>
<td>Short rods, cocoid forms</td>
<td>Negative</td>
<td>34–38</td>
<td>Smooth</td>
<td>Orange³</td>
</tr>
<tr>
<td>Rhodococcus</td>
<td>Irregular rods, cocoid forms</td>
<td>Weakly positive</td>
<td>34–64</td>
<td>Rough to smooth</td>
<td>Beige, pink orange</td>
</tr>
<tr>
<td>Gordona</td>
<td>Irregular rods, cocoid forms</td>
<td>Weakly positive</td>
<td>48–66</td>
<td>Rough</td>
<td>Beige to salmon orange</td>
</tr>
<tr>
<td>Tsukamurella</td>
<td>Irregular rods</td>
<td>Positive</td>
<td>64–78</td>
<td>Rough</td>
<td>Beige, orange</td>
</tr>
<tr>
<td>Nocardia</td>
<td>Filaments, short rods</td>
<td>Positive</td>
<td>44–60</td>
<td>Rough</td>
<td>Pale tan, pink orange</td>
</tr>
</tbody>
</table>

³ Dietza natroliimnaois is similar to D. maris, but its colonies have coral red pigmentation.

D. maris was originally known as Rhodococcus maris. On the basis of comparisons of 16S rDNA sequences, as well as the peculiar structure of polar lipids and the presence of short-chain mycolic acids, Rainey et al. [1] proposed in 1995 the reclassification of R. maris in a new genus, Dietzia. Under routine conditions, differential identification occurs when orange-pigmented coryneform organisms are found that belong either to the genera Microbacterium, Arthrobacter, Brevibacterium, and Curtobacterium, which lack mycolates, or to the mycolate-containing genera Rhodococcus, Gordona, and Tsukamurella. These genera are acid-fast because they contain mycolic acids with relatively long chains, unlike the bacteria of the genera Corynebacterium and Dietzia, which contain mycolic acids with shorter chains (table 1). Some coryneform bacteria, including the genera Arthrobacter, Microbacterium, Brevibacterium, and Corynebacterium, have been reviewed by Funke et al. [6].

The recent version 2.0 of the API Coryne strip can be used for initial screening tests (enzymatic tests and carbohydrate fermentation reactions) and allows identification of strains of D. maris in a generic taxon named Rhodococcus species sensu lato. Nevertheless, the diversity of pigmented gram-positive rods and difficulties in the interpretation of biochemical tests require the use of chemotaxonomic methods (i.e., mycolic analysis by high-performance liquid chromatography or genomic comparisons) for assignment of such strains to the correct genus.

Rhodococci are widely distributed in nature and have frequently been isolated from soil and freshwater. D. maris has been isolated from soil and the skin and intestinal contents of carp [1, 2]. To our knowledge, there have been no reports of human infection due to D. maris. The pathogenic role of D. maris in our case is not clearly defined. Because the organism commonly occurs in the environment, it is difficult to distinguish infection from contamination or colonization.

D. maris probably caused bacteremia in our case since the organism was recovered in a pure catheter culture 8 months after the blood culture was positive. It is not certain that D. maris was involved in septic shock and superinfected the pneumothorax, since only 1 blood culture was positive and pleural fluid remained sterile. However, a pathogenic role is probable, since the positivity of the blood culture was concurrent with septic shock involving a pleural reaction. No other organisms were recovered from the other samples (pleural fluid, bronchial aspirate, and bronchoalveolar lavage fluid).

The findings of this case describing the emergence of a potentially new pathogen need to be confirmed by other reports. During the last decade, there has been a marked increase in the number of case reports regarding aerobic actinomycetes causing bacteremia related to the use of catheters. The case reported herein prompted us to add D. maris to the list of
Development of Listerial Meningitis during Ciprofloxacin Treatment

Listeria monocytogenes is a leading cause of community-acquired acute meningitis [1]. Optimal treatment is still uncertain, and there are no prospective, controlled trials with adequate numbers of patients [2]. We report a case of listerial meningitis that developed during treatment with oral ciprofloxacin. This case calls into question the efficacy of quinolones in the management of severe listerial infection.

A 62-year-old man was found to be febrile and unresponsive at home after having a severe headache and increasing lethargy. Five days before, while on a Mediterranean cruise, he had developed nausea, headache, and general malaise. While on the ship, the patient and his wife ate soft cheeses and assorted cold cuts of beef, pork, and poultry. The ship’s physician treated him with oral ciprofloxacin (500 mg twice a day) for a total of 5 days. During the first 3 days of treatment, his condition transiently improved. However, despite continuing ciprofloxacin therapy, he developed headache and lethargy. He had a history of hairy cell leukemia 11 years before (at which time he underwent splenectomy), and he had a history of asthma treated with prednisone (5 mg/d).

At the time of admission, he developed generalized seizures. Analysis of CSF revealed a white blood cell count of 381/mL (68% segmented neutrophils and 32% lymphocytes), protein level of 573 mg/dL, and glucose level of 171 mg/dL. Gram staining of CSF revealed polymorphonuclear cells but no microorganisms. Computed tomography of the brain (without contrast medium) was unremarkable. Initial therapy was ceftriaxone, vancomycin, acyclovir, ampicillin (2 g intravenously every 4 h), and gentamicin (150 mg intravenously every 12 h). Treatment with ceftriaxone and vancomycin was discontinued on the second hospital day once CSF cultures yielded L. monocytogenes, and acyclovir administration was discontinued on the fifth hospital day, when PCR analysis was negative for herpesviruses.

The patient had severe upper extremity tremor, memory loss, and ataxic gait. With antibiotic therapy, the patient’s neurological status slowly improved. He received ampicillin and gentamicin for a total of 42 and 14 days, respectively. After 2 years of follow-up, he has achieved a near-complete recovery.

The patient developed listerial meningitis despite concurrent ciprofloxacin treatment. He was immunocompromised in that he did have a history of hairy cell leukemia and was asplenic. In addition, he was receiving daily treatment with low doses of oral prednisone.

Current guidelines for treatment of CNS infection due to Listeria include ampicillin combined with gentamicin [3, 4]. The duration of treatment should be at least 21 days [3]. The patient received 6 weeks of ampicillin therapy because of recurrent seizure activity.

A MEDLINE search of the literature from 1966 to May 1999 with the key words “Listeria” and “ciprofloxacin” or “quinolone” revealed no previous reports of listerial infection developing during quinolone therapy. Most reports of quinolone activity against L. monocytogenes have involved in vitro testing.

The mode of spread of Listeria is primarily through contaminated food [3]. Among food-related infections, listeriosis has a high case-fatality rate (~25%) [1].

Ciprofloxacin has been demonstrated to be bacteriostatic against Listeria [4] in usual concentrations. Of the “older” quinolones, ciprofloxacin is the most effective against L. monocytogenes [5], although enoxacin [6], norfloxacin [5–7], ofloxacin [5, 6], pefloxacin [5], and levofloxacin [7, 8] have been found to inhibit Listeria in vitro.

The newer fluoroquinolones have exhibited promising activities against Listeria in vitro. Sparfloxacin has been shown to be effective [7, 8], although serum concentrations attained following oral administration are below required therapeutic levels [8]. Trovafloxacin is more potent than sparfloxacin, with an MIC<sub>90</sub> ≤0.25 mg/mL [7]. Clinafloxacin has been found to have

References


