**Flavimonas oryizihabitans** Bacteremia: Clinical Features and Microbiological Characteristics of Isolates

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Flavimonas oryizihabitans is rarely reported as a pathogen in humans. Twelve cases of *F. oryizihabitans* bacteremia were diagnosed at National Taiwan University Hospital over a 3-year period. The clinical features of these patients were analyzed, and antimicrobial susceptibilities and random amplified polymorphic DNA (RAPD) patterns of the 12 isolates were studied. Among these 12 patients, eight (67%) had underlying neoplastic diseases and all acquired *F. oryizihabitans* bacteremia while hospitalized. The clinical syndromes included primary bacteremia in 5 patients (42%), biliary tract infection in 3 (25%), and peritonitis, subdural empyema, infusion-related bacteremia, and pneumonia in 1 each. Polymicrobial bacteremia or concomitant fungemia was seen in three patients (25%). All the patients survived after antibiotic treatment. All isolates were susceptible to piperacillin, third-generation cephalosporins, aminoglycosides, and quinolones but resistant to cephalothin, cefturoxime, and trimethoprim. Susceptibility to aztreonam was variable (25%). The RAPD patterns differed among the isolates, indicating the epidemiological unrelatedness of these infections. *F. oryizihabitans* should be included as an etiology of severe nosocomial infection in patients with underlying debilitating diseases.

Flavimonas oryizihabitans, previously known as *Chromobacterium typhiflavum*, *Pseudomonas oryizihabitans*, and Centers for Disease Control and Prevention (CDC) group Ve-2 [1], is a nonfermenting, oxidase-negative, catalase-positive, gram-negative bacillus. The normal habitat of *F. oryizihabitans* is unclear. In hospitals, *F. oryizihabitans* has been isolated from sink drains and respiratory therapy equipment [2]. In nature, this organism has been isolated from rice paddies [3]. Although it has been isolated from various body sources in humans [4], this organism was not implicated as a pathogenic organism until 1977, when the first case of infection was reported [5].

Infections caused by *F. oryizihabitans* in previously reported cases included bacteremia, CNS infections, wound infections, and peritonitis [5–18]. The presence of foreign material, including indwelling intravascular catheters and artificial grafts [5, 6, 11, 14, 17, 19], plays a major role in nosocomial *F. oryizihabitans* bacteremia; other factors, including various surgical procedures [6, 17], previous first- or second-generation cephalosporin therapy [1], intravenous drug abuse [20], long-term use of steroids [20], liver cirrhosis [10], and bone marrow transplantation [17], have also been reported to be associated with *F. oryizihabitans* infection.

In this study, we report 12 cases of *F. oryizihabitans* bacteremia that were seen at our hospital in the past 3 years. The clinical features of these 12 patients were reviewed, and the in vitro susceptibility to 17 antimicrobial agents and molecular types of the 12 isolates were studied.

**Patients and Methods**

Clinical features. From January 1993 to December 1995, positive blood cultures from the microbiology laboratory at National Taiwan University Hospital, a 2,000-bed teaching hospital serving as a referral center in northern Taiwan, were reviewed for isolation of *F. oryizihabitans*. Medical records of all patients whose blood cultures were positive for this organism were analyzed retrospectively. Relevant information was collected, including demographic data, underlying diseases, clinical manifestations, predisposing factors, the in-hospital day of the first *F. oryizihabitans*-positive blood culture, polymicrobial bacteremia, other sources of isolation of *F. oryizihabitans*, antibiotic regimens before and after blood culture results were available, complications, and outcomes.

Definitions. Bacteremia, infusion-related bacteremia, and intravenous device-related infection were defined in accordance with previous descriptions [21–25]. Bacteremia that developed at least 72 hours following admission was regarded as nosocomial bacteremia, while bacteremia developing earlier was considered community-acquired. Concurrent bacteremia was defined as bacteremia that developed seven days before *F. oryizihabitans* bacteremia during the hospital stay.
Neutropenia was defined as a WBC count of $<4 \times 10^9$/L. Previous first- or second-generation cephalosporin therapy was indicated if such agents had been received within 2 weeks before the occurrence of *F. oryzae* bacteremia. Long-term use of steroids was indicated when steroid therapy had been received for at least 2 weeks before onset of *F. oryzae* bacteremia. Recent surgery was indicated when a surgical procedure had been performed within 1 month prior to *F. oryzae* bacteremia. Antibiotic therapy was considered to be appropriate if at least one of the drugs chosen proved to be active against the isolate, on the basis of the results of in vitro susceptibility testing.

**Bacterial isolates.** Blood specimens of the patients were processed with the BACTEC 660 nonradiometric blood culture system (Becton Dickinson, Sparks, MD) in BACTEC 6A and 7A media. The organisms were identified by conventional methods [26] and further identified as *F. oryzae* by the API 20 NE system (bioMérieux, Marcy l’Etoile, France), and the Vitek GNI system (bioMérieux Vitek, Hazelwood, MO).

**Antimicrobial susceptibility testing.** MICs of 17 antimicrobial agents against the 12 isolates of *F. oryzae* were determined by the agar dilution method described by the National Committee for Clinical Laboratory Standards [27]. The following antimicrobial agents were obtained from the corresponding manufacturers as standard reference powders of known potency for laboratory use: cephalothin, cefuroxime, gentamicin, netilmicin, amikacin, and trimethoprim (Sigma Chemical, St. Louis); piperacillin and minocycline (Lederle Laboratories, Pearl River, NY); cefotaxime (Hoechst AG, Frankfurt, Germany); ceftriaxone (Roche Laboratories, Nutley, NJ); ceftazidime (Glaxo Operations, Greenford, England); cefoperazone (Pfizer, New York); moxalactam (Shionogi Pharmaceutical, Osaka, Japan), aztreonam (Bristol-Myers Squibb Laboratories, New York); imipenem (Merck Sharp & Dohme, West Point, PA); ofloxacin (Daichi Pharmaceutical, Tokyo), and ciprofloxacin (Bayer, Leverkusen, Germany).

All the drugs were incorporated into agar in serial twofold concentrations from 0.25 μg/mL to 128 μg/mL, except trimethoprim, which was incorporated from 0.03 μg/mL to 16 μg/mL. The MIC of each antibiotic was defined as the lowest concentration that inhibited visible growth of the organism. The MIC of each antibiotic was defined as the lowest concentration that inhibited visible growth of the organism.

**Random amplified polymorphic DNA (RAPD) assay.** DNA of the isolate was prepared from a culture grown in brain-heart infusion broth (Difco Laboratories; Detroit) for 18–24 hours at 35°C in ambient air. Isolation and purification of bacterial DNA were performed with a commercial kit (Puregene; Gentra Systems, Minneapolis). The RAPD typing, generated by arbitrarily primed PCR, was performed with two arbitrary oligonucleotide primers obtained from OPERON Technologies (Alameda, CA): OPA-4 (5′-AATCGGGCCTG-3′) and OPA-10 (5′-GTGATGCGAG-3′).

The reaction mixture for PCR contained 10 mM of Tris-HCl (pH, 8.8); 50 mM of KCl; 1.5 mM of MgCl₂; 0.1% (vol/vol) Triton X-100; 200 μM of dATP, dCTP, dGTP, and dTTP; 25 pM of a primer; 1 U of Taq DNA polymerase (Perkin-Elmer Cetus, Norwalk, CT); and bacterial DNA extract (40–50 ng/mL). The PCR conditions were followed as described previously [31]. The samples were overlaid with 10 μL of mineral oil and were amplified in the PTC-100 thermocycler (MJ Research, Watertown, MA). Amplification fragments were separated by electrophoresis in a 1.5% agarose gel. A 1-kb ladder (Gibco BRL Products, Gaithersburg, MD) was used in each gel as a DNA fragment-size marker.

**Results**

**Clinical Features**

The demographic data and clinical characteristics of the 12 patients with *F. oryzae* bacteremia are summarized in table 1. Half of these patients were male, and the mean age was 38.8 years (range, 1 month to 65 years). All patients had severe underlying diseases, including 8 (67%) with neoplastic diseases, 2 (17%) with heart diseases, and 1 each with aplastic anemia and biliary atresia. All patients had indwelling intravascular catheters implanted before the bacteremic episodes, 2 had previously used a first- or second-generation cephalosporin, 3 had long-term therapy with steroids, 2 had recently undergone surgery, 1 had liver cirrhosis, and 2 had neutropenia.

All cases of *F. oryzae* bacteremia occurred after the second week of hospitalization. Five patients (42%) manifested primary *F. oryzae* bacteremia, three patients (25%) had biliary tract infection, and one (8%) each had subdural empyema, infusion-related bacteremia, peritonitis, and pneumonia. Polymicrobial bacteremia or concomitant fungemia was found in three patients (25%). Two patients (17%) had concurrent bacteremia.

Among five patients with primary bacteremia, all but one (patient 5) had underlying neoplastic diseases and had received chemotherapy during their hospital stay. One (patient 4) developed bacteremia during the neutropenic stage. In all of these patients except one (patient 3), intravascular catheters were removed but were not sent for culture after documentation of *F. oryzae* bacteremia. *F. oryzae* was isolated in blood culture only, and no *F. oryzae* or any other organism was isolated from other body sites in these patients.

Among three patients with biliary tract infection, all had underlying hepatobiliary diseases and developed fever, chills, jaundice, and abdominal pain during bacteremic episodes. *F. oryzae* was isolated in blood culture only, and no *F. oryzae* or any other organism was isolated from other body sites in these patients. Bilary tract infection was diagnosed clinically.
Table 1. Clinical features of the 12 patients whose *F. oryzihabitans* bacteremia was diagnosed at National Taiwan University Hospital over a 3-year period.

<table>
<thead>
<tr>
<th>Patient no./age/sex</th>
<th>Underlying disease</th>
<th>Precipitating factor(s)</th>
<th>Clinical syndrome</th>
<th>Other bacteria isolated</th>
<th>F. oryzihabitans isolated</th>
<th>Antibiotic treatment</th>
<th>Before culture report*</th>
<th>After culture report</th>
<th>Device removed</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/57 y/M</td>
<td>Rectal cancer</td>
<td>CVP, cefoxitin therapy</td>
<td>Primary bacteremia (IVDAI?)</td>
<td>None</td>
<td>None</td>
<td>Cefoxitin, dibekacin</td>
<td>Cefoxitin, netilmicin</td>
<td>Y</td>
<td>D†</td>
<td></td>
</tr>
<tr>
<td>2/50 y/F</td>
<td>Malignant lymphoma</td>
<td>PIVC</td>
<td>Primary bacteremia (IVDAI?)</td>
<td>None</td>
<td>None</td>
<td>Cefoxitin, dibekacin</td>
<td>Cefoxitin, netilmicin</td>
<td>Y</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>3/57 y/M</td>
<td>Nasopharyngeal cancer</td>
<td>Port-A-Cath, steroid therapy</td>
<td>Primary bacteremia (IVDAI?)</td>
<td>None</td>
<td>None</td>
<td>Amoxicillin/ clavulanate, ceftriaxone</td>
<td>Cefoxitin, piperacillin, amikacin</td>
<td>Y</td>
<td>D†</td>
<td></td>
</tr>
<tr>
<td>4/3 y/M</td>
<td>Acute myelogenous leukemia</td>
<td>PIVC</td>
<td>Primary bacteremia (IVDAI?)</td>
<td>None</td>
<td>None</td>
<td>Amoxicillin/ clavulanate, ceftriaxone</td>
<td>Cefoxitin, piperacillin, amikacin</td>
<td>Y</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>5/35 y/F</td>
<td>Myocardial infarction</td>
<td>PIVC</td>
<td>Primary bacteremia (IVDAI?)</td>
<td>None</td>
<td>None</td>
<td>Ampicillin/ sulbactam, gentamicin</td>
<td>Cefoperazone, gentamicin, metronidazole</td>
<td>Y</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>6/52 y/F</td>
<td>Cholangiocarcinoma</td>
<td>PIVC</td>
<td>Biliary tract infection</td>
<td>None</td>
<td>None</td>
<td>Cefoperazone, gentamicin, metronidazole</td>
<td>Cefoxime, gentamicin, metronidazole</td>
<td>Y</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>7/65 y/M</td>
<td>Hepatoma</td>
<td>PIVC</td>
<td>Biliary tract infection</td>
<td>None</td>
<td>None</td>
<td>Cefoxime, gentamicin</td>
<td>Ceftriaxone</td>
<td>Y</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>8/1 y/F</td>
<td>Biliary atresia</td>
<td>PIVC</td>
<td>Biliary tract infection</td>
<td>None</td>
<td>None</td>
<td>Ceftriaxone</td>
<td>Ceftriaxone</td>
<td>Y</td>
<td>D†</td>
<td></td>
</tr>
<tr>
<td>9/54 y/M</td>
<td>Esophageal cancer</td>
<td>CVP, esophagectomy</td>
<td>Infusion- related bacteremia</td>
<td>Staphylococcus simulans, Staphylococcus epidermidis</td>
<td>CVP tip, lipid emulsion infusion</td>
<td>Ceftepoxacin, oxacillin</td>
<td>Ceftepoxacin, oxacillin</td>
<td>Y</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>10/23 y/F</td>
<td>Aplastic anemia</td>
<td>CVP, steroid therapy</td>
<td>Pneumonia</td>
<td>MRSE, <em>Stenotrophomonas maltophilia</em></td>
<td>None</td>
<td>Ceftazidime, amikacin, amphotericin B</td>
<td>Ceftazidime, amikacin, amphotericin B</td>
<td>Y</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>11/1 mo/F</td>
<td>Congenital heart disease (ECD)</td>
<td>CVP, laparotomy, jejunostomy</td>
<td>Peritonitis</td>
<td>Rhodotorula pilimance</td>
<td>Ascitic fluid</td>
<td>Metronidazole, imipenem, vancomycin, amphotericin B</td>
<td>Metronidazole, imipenem, amphotericin B</td>
<td>Y</td>
<td>D†</td>
<td></td>
</tr>
<tr>
<td>12/69 y/M</td>
<td>Astrocytoma</td>
<td>Cranioctomy, steroid and cefaclor therapies, CVP</td>
<td>Subdural empyema</td>
<td>None</td>
<td>None</td>
<td>Oxacillin, cefazidime</td>
<td>Clandamycin, cefazidime</td>
<td>Y</td>
<td>S†</td>
<td></td>
</tr>
</tbody>
</table>

NOTE. CVP = central venous catheter; D = died; ECD = endocardial cushion defect; IVDAI = intravascular device-associated infection; MRSE = methicillin-resistant *Staphylococcus epidermidis*; N = no; PIVC = peripheral iv catheter; S = survived; Y = yes.

* Antibiotic treatment given in the interval between development of bacteremia and availability of the *F. oryzihabitans*-positive culture result.
† Death due to underlying neoplastic disease.
‡ Death due to an unrelated episode of septic shock caused by organisms other than *F. oryzihabitans*.
§ The patient suffered septic shock during the bacteremic episode and survived following antibiotic treatment.

The patient with esophageal cancer (patient 9) received total parenteral nutrition via a central venous catheter after esophagectomy. At the onset of bacteremia following infusion of lipid emulsion (lipofundin; B. Braun Melsungen AG, Melsungen, Germany), he developed fever, chills, tachycardia, tachypnea, and signs of local inflammation at the site of catheter insertion. Cultures of blood, the central venous catheter tip, and lipofundin all yielded *F. oryzihabitans* and coagulase-negative staphylococci. Though molecular typing of three isolates of *F. oryzihabitans* was not performed, the antibiograms of these isolates determined by the disk-diffusion method were identical. Cultures of other lipid infusates of the same lot number were negative for *F. oryzihabitans*.

The patient with aplastic anemia (patient 10) developed fever, chills, tachypnea, dyspnea, and productive cough with purulent sputum during the neutropenic stage. Crackles in the right lung field were noted on auscultation. Chest radiographs revealed a pnemonic patch in the right lung field. *F. oryzihabitans*, methicillin-resistant *Staphylococcus epidermidis*, and *Stenotrophomonas maltophilia* were isolated in blood cultures. Gram staining of sputum showed numerous polymorphonuclear...
cells and few gram-negative rods. No *F. oryzihabitans* was isolated from sputum or other body sites.

The patient with congenital heart disease (patient 11) developed peritonitis after laparotomy and jejunostomy for neonatal necrotizing enteritis. Two isolates of *F. oryzihabitans* recovered from blood and ascitic fluid, respectively, had the identical antibiogram. The jejunostomy feeding tube was not removed and thus not sent for culture. No *F. oryzihabitans* or other organisms were isolated from other body sites.

The patient with astrocytoma (patient 12) developed fever, chills, and disturbance of consciousness after undergoing a craniotomy with brain tumor excision and subsequent hematoma evacuation. Brain CT revealed a subdural lesion. Gram staining of the purulent substance drained from the subdural lesion showed few gram-negative rods and many polymorphonuclear cells. A blood culture yielded *F. oryzihabitans*, but no organism was isolated from the subdural empyema or other body sites. The drainage tube was removed but not sent for culture.

**Microorganism Characteristics**

A total of 12 blood isolates of *F. oryzihabitans* from these 12 patients were collected, accounting for 0.29% of the total number of positive blood cultures over a 3-year period. For the majority of patients (all except patients 1, 2, 4, and 12), at least two sets of blood cultures were positive for this organism. All these isolates were strictly aerobic, oxidase-negative, catalase-positive, gram-negative bacilli that grew at room temperature and 37°C but not at 5°C or 42°C. Colonies after 24 hours of incubation on sheep blood agar were wrinkled, circular, ~1–2 mm in diameter, and yellow-pigmented.

The organism showed a negative reaction for nitrate reduction, esculin hydrolysis, arginine dehydrolase, lysine decarboxylase, and orthonitrophenyl-β-D-galactopyranoside. These distinctive tests differentiated *F. oryzihabitans* from *Chryseomonas luteola*. Biochemical profiles produced by the API 20 NE system and Vitek GNI card showed a probability of >99% that the organism was *F. oryzihabitans*. All of the above characteristics indicated that the isolates were in agreement with the identification of *F. oryzihabitans*.

**Antimicrobial Susceptibility**

All these isolates were susceptible to piperacillin, imipenem, gentamicin, netilmicin, amikacin, ofloxacin, ciprofloxacin, and minocycline. Among the third-generation cephalosporins, the MICs of moxalactam and cefotaxime (MIC₉₀ values of 8 and 4 µg/mL, respectively) were higher than those of cefoperazone, ceftriaxone, and ceftazidime (MIC₉₀ values, <0.25 µg/mL). Susceptibility to aztreonam was limited, with an MIC₉₀ of 8 µg/mL and an MIC₉₀ of 16 µg/mL. All the isolates were resistant to cephalothin (MIC₉₀ >128 µg/mL), cefuroxime (MIC₉₀ >128 µg/mL), and trimethoprim (MIC₉₀ >16 µg/mL).

**RAPD Patterns**

Arbitrarily primed PCR showed that the 12 isolates had different RAPD patterns and could be clearly separated from each other with use of the two primers (figure 1).

**Treatment and Outcome**

Antibiotics used both before and after positive blood cultures identified *F. oryzihabitans* as the causative organism proved to be active against all blood isolates of these patients, on the basis of the results of routine disk susceptibility testing. All the patients were treated with appropriate antibiotics for 10–14 days following onset of bacteremia. Intravascular catheters were removed from all patients but one (patient 3) after documentation of *F. oryzihabitans* bacteremia. Although the course of patient 12 was complicated by septic shock, all patients’ conditions improved following appropriate antimicrobial therapy.

Among these patients, 3 died of underlying neoplastic diseases: acute myelogenous leukemia with acute blast crisis (patient 4), rectal cancer with multiple metastases (patient 1), and cholangiocarcinoma with hepatic failure (patient 6). Two (patients 8 and 11) died of an unrelated episode of septic shock due to *Salmonella* serotype O9 and *E. coli*, respectively, 1 and 2 months after documentation of *F. oryzihabitans* bacteremia. The other seven patients survived.

**Discussion**

Bacteria of CDC group Ve are motile, yellow-pigmented, gram-negative rods with a cellular fatty acid composition similar to that of *Pseudomonas* species [2], despite the fact that group Ve strains are oxidase-negative. CDC group Ve organisms are subdivided into two biotypes, Ve-1 and Ve-2, named *C. luteola* and *F. oryzihabitans*, respectively. *F. oryzihabitans* shares many microbiological features with *C. luteola* but may be differentiated from it on the basis of flagellar morphology [2], guanine-plus-cytosine DNA composition [28], and biochemical reactions [3]. In this study, all the isolates were identified as *F. oryzihabitans* by means of conventional tests as well as the API 20 NE system and Vitek commercial identification systems.

Compared with pulsed-field gel electrophoresis and ribotyping, RAPD analysis has been considered a simple, rapid, reproducible, and discriminatory tool in epidemiological typing of clinical isolates [29–31]. No previously published studies have described the use of this technique to evaluate the clonal relationships of clinical isolates of *F. oryzihabitans*. Although the fact that 12 patients had nosocomial infections caused by this unusual organism at the same hospital might suggest a common source (even though they were dispersed over a 3-year period), the different RAPD patterns among these isolates of *F. oryzihabitans* indicate that all of these nosocomial infec-
Figure 1. Random amplified polymorphic DNA (RAPD) patterns generated by arbitrarily primed PCR with use of two primers, OPA-4 (A) and OPA-10 (B). Profiles 1–12 are for *F. oryzihabitans* isolates from patients 1 to 12, respectively, as indicated in table 1. Molecular sizes are indicated in kilobase (kb) pairs.

...tions were epidemiologically unrelated. Our results also show that the RAPD technique can provide excellent discriminatory power for epidemiological typing of strains of *F. oryzihabitans*.

Unlike the cases described in previous reports, all cases of *F. oryzihabitans* bacteremia in this study were hospital-acquired. Previous use of first- or second-generation cephalosporins that may select for *F. oryzihabitans* colonization and predispose patients to bacteremic infection with this organism seemed not as important as has been previously reported [1]. Some clinical syndromes, including biliary tract infections, infusion-related bacteremia due to the use of contaminated lipid infusate, and pneumonia that was likely related to the use of a contaminated nebulizer, are unique and to our knowledge have never been reported in the literature. Septic shock, which usually is complicated by gram-negative bacteremia, developed in only one patient (8%), who responded well to appropriate antimicrobial therapy.

As described in the literature [15], some cases of *F. oryzihabitans* bacteremia in this study were associated with polymicrobial bacteremia or concurrent bacteremia. Most other isolated organisms were coagulase-negative staphylococci (80%), which were associated with infections of indwelling foreign devices. This indicated that indwelling intravascular catheters or artificial grafts may play an important role in *F. oryzihabitans*-related polymicrobial bacteremia and concurrent bacteremia.

The antibiograms presented in this study partially agreed with those of the previous reports [6, 15, 20, 32]. Although all our isolates were susceptible to moxalactam, the MICs of moxalactam against these isolates were significantly higher than those of other third-generation cephalosporins. For the
treatment of infections caused by *Flavimonas oryzihabitans*, piperacillin, third-generation cephalosporins (except moxalactam), aminoglycosides, and quinolones should be included as drugs of choice.

As compared with other cases of gram-negative bacteremia, which are frequently complicated by septic shock and account for approximately two-thirds of the isolates recovered from patients with septic shock [33], only one patient in this study suffered from septic shock. This case was due to delayed diagnosis, and the patient responded well to appropriate antimicrobial agents.

This indicates the clinical course of *Flavimonas oryzihabitans* bacteremia is less complicated and less fulminant and can be treated successfully with appropriate antimicrobial agents, when advanced to the point of causing septic shock. Because there was no evidence of intravascular device–associated infection, the role of removal of the intravascular catheter did not seem important in the management of septic shock in this patient.

Every patient in this study improved clinically following treatment with at least one appropriate antimicrobial agent employed against *Flavimonas oryzihabitans* and other concomitantly isolated organisms. In contrast with a previous report [32], nine patients (75%) were treated with only one appropriate antimicrobial agent with good activity against *Flavimonas oryzihabitans* and responded well to it. This suggests that monotherapy was probably sufficient in treating *Flavimonas oryzihabitans* infections.

No patient died directly of *Flavimonas oryzihabitans* bacteremia. The *Flavimonas oryzihabitans* infection seemed rather benign and rarely resulted in death. As described in previous reports [14, 32], one of our patients was treated successfully with effective antibiotics, without removal of the intravascular catheter (Port-a-cath; Pharmacia, North Ryde, Australia). Despite removal of the vascular access device (which was performed routinely in cases of bacteremia at our hospital) from 11 of 12 patients, previous studies [14, 32] have suggested that *Flavimonas oryzihabitans* is relatively avirulent and that appropriate antimicrobial therapy can be successful in treating patients with intravascular device–associated infection due to this organism. Catheter-related infections with this organism may not require removal of the catheter.

In summary, we have reported 12 cases of *Flavimonas oryzihabitans* bacteremia and have highlighted the fact that *Flavimonas oryzihabitans* should be considered a potential nosocomial pathogen, with a propensity to infect critically ill or immunocompromised patients who have undergone surgery or have had indwelling catheters or other foreign bodies implanted.

References


