Case Report

Kodamaea (Pichia) ohmeri fungaemia in a premature neonate

S. J. Taj-Aldeen,1 S. H. Doiphode1 and X. Y. Han2

1Microbiology Division, Department of Laboratory Medicine and Pathology, Hamad Medical Corporation, PO Box 3050 Doha, Qatar
2Department of Laboratory Medicine, The University of Texas M.D. Anderson Cancer Center, Houston, TX 77030, USA

Introduction

Kodamaea ohmeri is a yeast that rarely causes human infections. The first case of K. ohmeri fungaemia in a premature neonate is reported; it was successfully treated with liposomal amphotericin B. Biochemical identification of the yeast was performed by Vitek II and API and was confirmed by rRNA gene sequencing. K. ohmeri as a human pathogenic yeast is uncommon to hospitalized neonates and immunocompromised individuals.

Case report

A newborn baby, one of quadruplets, was delivered in October 2004 to a 26-year-old mother in the 25th week of gestation due to spontaneous rupture of membranes and premature labour pains. The baby was a low birth weight female (680 g). She was intubated because of a low APGAR score, and work up for sepsis was done and antimicrobial therapy with gentamicin and penicillin was initiated. The three initial blood cultures were negative. During the first therapy with gentamicin and penicillin was initiated. The baby developed clinical necrotizing enterocoli. Three successive blood cultures during 3 weeks were negative for yeast infection (Han et al., 2004). We report the first case of K. ohmeri fungaemia in a premature neonate successfully treated with liposomal amphotericin B.

Biochemical studies

Biochemical identification of the yeast was confirmed by sequence analysis of 5·8S rRNA using the methods previously applied by Han et al. (2004). The sequence matched 217/217 = 100 % with K. ohmeri ATCC 46053 T, GenBank AF218977 (Chen et al., 2000). The organism failed to produce ascospores on Sabouraud dextrose agar and malt extract agar + 2·5 % glucose even with prolonged incubation period (14 days).

Blood cultures were performed using the Bactec automated culturing system (BD Diagnostic Systems) and paediatric bottle (Shannon Industrial Estate, Ireland). Identification of the yeast isolate was carried out through biochemical profiles with Vitek II and API ID 32C (bioMérieux). Sequence analysis of the 5·8S rRNA was performed to confirm the biochemical identification. Analysis methods were performed as previously mentioned (Han et al., 2004).

Yeast genomic DNA was extracted using a simple method described previously for bacteria (Han et al., 2002).
**Table 1. Clinical and microbiological data on the published cases of *K. ohmeri***

<table>
<thead>
<tr>
<th>Age/sex</th>
<th>Predisposing factor</th>
<th>Episode</th>
<th>Treatment*</th>
<th>5-8S rRNA match</th>
<th>Outcome</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 48/F</td>
<td>Diabetes, kidney transplant</td>
<td>Fungaemia</td>
<td>AB</td>
<td>ND</td>
<td>Died</td>
<td>Bergman <em>et al.</em> (1998)</td>
</tr>
<tr>
<td>2 71/M</td>
<td>Pacemaker, endocarditis</td>
<td>Fungaemia</td>
<td>AB</td>
<td>ND</td>
<td>Died</td>
<td>Matute <em>et al.</em> (2000)</td>
</tr>
<tr>
<td>3 64/M</td>
<td>Peritoneal dialysis</td>
<td>Peritonitis</td>
<td>FC then AB</td>
<td>ND</td>
<td>Resolved</td>
<td>Choy &amp; Wong (2000)</td>
</tr>
<tr>
<td>4 76/M</td>
<td>Pacemaker, prosthetic valve</td>
<td>Endocarditis</td>
<td>Surgery, FC, AB</td>
<td>ND</td>
<td>Resolved</td>
<td>Reina &amp; Larone (2002)</td>
</tr>
<tr>
<td>5 73/M</td>
<td>Lymphoma, steroids</td>
<td>Fungiurea</td>
<td>FC</td>
<td>ND</td>
<td>Resolved</td>
<td>Puerto <em>et al.</em> (2002)</td>
</tr>
<tr>
<td>6 42/M</td>
<td>Hepatitis C, i.v. drug use</td>
<td>Endocarditis</td>
<td>Surgery</td>
<td>ND</td>
<td>Resolved</td>
<td>Joa˜o <em>et al.</em> (2002)</td>
</tr>
<tr>
<td>7 84/M</td>
<td>Sinus cancer with central venous catheter</td>
<td>Fungaemia</td>
<td>FC</td>
<td>ND</td>
<td>Resolved</td>
<td>Hitomi <em>et al.</em> (2002)</td>
</tr>
<tr>
<td>8 59/M</td>
<td>Long hospitalization period, antibacterial therapy</td>
<td>Phlebitis</td>
<td>ND</td>
<td>ND</td>
<td>Resolved</td>
<td>Shin <em>et al.</em> (2003)</td>
</tr>
<tr>
<td>9 14/M</td>
<td>Leukaemia, neutropenia</td>
<td>Fungaemia</td>
<td>FC</td>
<td>100 %</td>
<td>Died</td>
<td>Han <em>et al.</em> (2004)</td>
</tr>
<tr>
<td>10 75/M</td>
<td>Hip tumour with wound</td>
<td>Polymicrobial wound infection</td>
<td>Drainage</td>
<td>99.5 %</td>
<td>Resolved</td>
<td>Han <em>et al.</em> (2004)</td>
</tr>
<tr>
<td>11 Neonate/F</td>
<td>Premature, 680 g weight</td>
<td>Fungaemia</td>
<td>FC, AB then liposomal AB</td>
<td>100 %</td>
<td>Resolved</td>
<td>Present study</td>
</tr>
</tbody>
</table>

*AB, amphotericin B; FC, flucytosine.

**Discussion**

The clinical and microbiological data available on *K. ohmeri* from the reported cases are shown in Table 1. All the 10 cases of *K. ohmeri* infections reported so far have been associated with adult patients, aged 14–84 years (median age of 67 years). Thus the present case is the first case of *K. ohmeri* fungaemia in a premature neonate. The most predominant underlying condition for the reported infections is the immunocompromised status of the patients. Our case further suggests that premature birth is also a risk factor.

*Kodamaea* is a genus of ascosporogenic yeast which belongs to the class Ascomycetes. *K. ohmeri* is the telomorph of *Candida guilliermondii* var. *membranaefaciens*. However, our strain failed to produce ascospores in culture media. The strain was identified by biochemical tests (Vitek II and API ID 32C), and confirmed by rRNA gene sequencing analysis. The 5·8S rRNA sequence of *K. ohmeri* is unique among various yeasts (Chen *et al.*, 2000).

Antifungal susceptibility data are available for five strains (Han *et al.*, 2004). All were susceptible in vitro to amphotericin B (MIC = 0·2–1 mg ml⁻¹), as was our *K. ohmeri* strain (0·064 mg ml⁻¹). Our patient did not respond to empiric treatment with fluconazole (in vitro dose-dependent susceptibility to this strain ≥ 32 μg ml⁻¹). Regular amphotericin B was not effective either as appeared from the positive successive blood culture results; however, the patient responded to liposomal amphotericin B. Noteworthy, of the 11 reported cases so far, eight patients recovered and three died.

The study case represents a hospital-acquired infection. Disseminated candidiasis is the most common nosocomial fungal infection, and *Candida albicans* has been reported to account for most cases of invasive candidiasis (Emori & Gaynes, 1993; Pfaller, 1995). However, recent reports have also suggested emergence of infections caused by non-*C. albicans* *Candida* species (Wingard, 1995). In addition, less common pathogenic yeasts such as *Trichosporon* and *Malassezia* spp. have been reported with increased frequency as causes of nosocomial infections, especially in NICU patients (Fridkin & Jarvis, 1996). Although reports on emerging fungal pathogens fail to include *K. ohmeri* as a human pathogenic yeast, based on the recent series of case reports (Table 1) and this case report it could be considered an uncommon pathogen for premature neonates.

**References**


