Ocular infection associated with Delftia lacustris: first report

Dear Editor,

*Delftia* is an aerobic, Gram-negative, oxidase-positive, non-glucose-fermenting bacillus. *Delftia* species are ubiquitous in water and soil. However, they are rarely associated with human infections. To date, four *Delftia* species (*D. acidovorans*, *D. tsuruhatensis*, *D. lacustris*, and *D. litopenaei*) have been described. *D. acidovorans* (formerly known as *Comamonas acidovorans*) and *D. tsuruhatensis* have been reported as causes of human infections such as catheter-related bacteremia, pneumonia, empyema, peritonitis, and carbapenem, but resistant to aminoglycosides according to the Vitek system (bioMérieux Inc.) using 2011 Clinical Laboratory Standards Institute criteria for *Pseudomonas* (Table 1). The patient was initially treated with fortified topical ofloxacin, voriconazole, and gentamicin. Antibiotics were switched to topical ciprofloxacin and systemic ceftazidime after isolation of *Delftia*. However, the patient did not respond to therapy, and two months later underwent evisceration.

*D. lacustris* was first described in 2009 in freshwater in Denmark. *D. lacustris* and *D. tsuruhatensis* have 99.9% nucleotide similarity in the 16S rRNA gene sequence, as shown in this report. They can be differentiated based on the use of certain carbon sources for growth, such as D-mannitol and D-malic acid, as well as chitinase activity. In this study, the isolate was determined to be *D. lacustris* as D-mannitol and D-malate were utilized for growth in the API 20 NE system (bioMérieux). Shin et al. reported four possible human infections caused by *D. lacustris*. However, all of these were considered to be contaminants because only one bottle out of two sets of blood cultures grew *Delftia*, and some patients recovered without antibiotic therapy.

Very recently, we described a true bloodstream infection by *D. lacustris*, which was initially identified as *D. acidovorans* by Vitek 2 system, as in this report. All four *D. lacustris* infections reported by Shin et al. were also originally identified as *D. acidovorans* by Vitek 2. This indicates that infections due to *D. lacustris* may be more common than previously thought due to misidentification by commercial systems.

According to species-independent clinical breakpoints provided by the European Committee on Antimicrobial Susceptibility Testing (EUCAST, 2014), our isolate was susceptible to aztreonam, ceftazidime, cefotaxime, piperacillin–tazobactam, ticarcillin–clavulanate, and carbapenems, but resistant to all aminoglycosides tested and ciprofloxacin. *Delftia* is generally considered resistant to aminoglycosides.

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Table 1 – Antimicrobial susceptibility profiles for Delftia lacustris.

<table>
<thead>
<tr>
<th>Antibiotics</th>
<th>MIC (µg/mL)</th>
<th>Susceptibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amikacin</td>
<td>≥64</td>
<td>R</td>
</tr>
<tr>
<td>Aztreonam</td>
<td>4</td>
<td>S</td>
</tr>
<tr>
<td>Cefepime</td>
<td>8</td>
<td>S</td>
</tr>
<tr>
<td>Cefazidime</td>
<td>≤1</td>
<td>S</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>2</td>
<td>I</td>
</tr>
<tr>
<td>Gentamicin</td>
<td>≥16</td>
<td>R</td>
</tr>
<tr>
<td>Imipenem</td>
<td>1</td>
<td>S</td>
</tr>
<tr>
<td>Meropenem</td>
<td>0.5</td>
<td>S</td>
</tr>
<tr>
<td>Piperacillin/tazobactam</td>
<td>≤4</td>
<td>S</td>
</tr>
<tr>
<td>Ticarcillin/clavulanic acid</td>
<td>≤8</td>
<td>S</td>
</tr>
</tbody>
</table>

MIC, minimum inhibitory concentration; S, susceptible; R, resistant.
* Because breakpoints for Delftia have not been established, this result refers to established criteria for Pseudomonas (2011 CLSI).

and cefotaxime may be effective for the treatment of Delftia infections because endocarditis caused by D. acidovorans has been successfully controlled using ceftriaxone alone.1 Although the minimum inhibitory concentrations (MICs) of trimethoprim–sulfamethoxazole, minocycline, and tigecycline were very low, we do not know the clinical implications of this because there are no antibiotic susceptibility criteria or guidelines for Delftia species.

This is the first report of ocular infection with D. lacustris accompanied by significant complications. Because commercial systems can misidentify Delftia species, molecular methods such as 16S rRNA gene sequencing may be required. Further clinical investigation of D. lacustris is necessary to determine optimal therapy for this unusual pathogen.

Conflicts of interest

The authors declare no conflicts of interest.

REFERENCES


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Received 25 April 2015
Accepted 6 May 2015
Available online 19 June 2015
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http://dx.doi.org/10.1016/j.bjid.2015.05.001