Aeromonas veronii biovar veronii septicaemia and acute suppurative cholangitis in a patient with hepatitis B

Antonella Mencacci, Elio Cenci, Rosanna Mazzolla, Senia Farinelli, Francesco D’Alò, Mariolina Vitali and Francesco Bistoni

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Gram-negative bacilli of the genus Aeromonas are widespread in aquatic environments and can be responsible for human infections. Although Aeromonas extraintestinal and systemic infections have been reported with growing frequency in recent years, Aeromonas septicaemia remains an uncommon finding, often associated with serious underlying disease and predominantly related to the species Aeromonas hydrophila, Aeromonas veronii biovar sobria and Aeromonas caviae. Here, a case of A. veronii biovar veronii septicaemia and acute suppurative cholangitis is reported in a patient with chronic hepatitis B.

Case report
A 76-year-old male who had been complaining of thoracic and abdominal pain for several days was admitted to the hospital after the onset of fever. He had a past history of cholecystectomy, due to gallstones 5 years earlier, diabetes and hepatitis B virus-related cirrhosis.

On examination, he had a temperature of 39.8°C with shivers, abdominal pain with right-upper-quadrant discomfort and positive Murphy’s sign. Laboratory investigation revealed a white blood cell count of 30,240 cells/mm³ (96% neutrophils), erythrocyte sedimentation rate of 25 mm h⁻¹, 182 mU glutamic-oxaloacetic transaminase ml⁻¹, 212 mU glutamic-pyruvic transaminase ml⁻¹, 193 mU alkaline phosphatase ml⁻¹, 2.42 mg bilirubin dl⁻¹, 359 mU γ-glutamyl transpeptidase ml⁻¹, 2.17 mg creatinine dl⁻¹ and 71 mg blood urea nitrogen dl⁻¹.

Abdominal echography showed enlarged and thickened liver, absence of gall bladder, ecotasia of intrahepatic and common bile ducts, multiple stones and sludge inside the common bile duct. Endoscopic retrograde cholangiopancreatieatography (ERCP), 6 days after admission, suggested infection of the biliary tract with purulent exudate at the level of the sphincter of Oddi, stenosis of the common bile duct in the third middle tract and marked ecotasia upward. Moreover, there were multiple, possibly infected, stones inside the common bile duct.

Blood samples were collected immediately after the fever spikes on admission and 3 days later (temperature 38.4°C) in BACTEC Standard 10 Aerobic and Lytic/10 Anaerobic bottles (Becton Dickinson). Bile was collected by a nasobiliary device, placed during ERCP, 6 days after admission. Blood and bile specimens yielded motile, Gram-negative, aeromonas-like cultures. Bile culture demonstrated Aeromonas veronii biovar sobria and Aeromonas caviae.

Introduction
Members of the genus Aeromonas have been associated with a wide spectrum of enteric and non-enteric diseases, in both immunocompromised and immunocompetent patients (Janda & Abbott, 1996, 1998). Aeromonas veronii was originally described by Hickman-Brenner et al. (1987) as a novel species in the genus Aeromonas that had previously been referred to by the Centers for Disease Control as Enteric Group 77. Genetic studies have indicated that this species consists of two biovars, A. veronii biovar sobria, negative for aesculin hydrolysis and ornithine decarboxylase, and A. veronii biovar veronii, positive for these reactions (Altwegg et al., 1990; Carthanchor & Altwegg, 1996).

A. veronii biovar veronii has rarely been isolated from humans and little information is available regarding its occurrence in clinical specimens and its ability to cause infections. In the original study (Hickman-Brenner et al., 1987), it was isolated from various non-sterile sites, such as wounds, faeces, sputum, maxillary sinus and endotrachal tube, in which its clinical significance remains unclear. Abbott et al. (1994) reported the first case of A. veronii biovar veronii bacteremia, in a 77-year-old man suffering from multiple underlying diseases, including sigmoid colon cancer. In a subsequent report (Hsueh et al., 1998), this species was responsible for bacteremia and necrotizing fascitis in a diabetic patient also affected by A. veronii biovar sobria urinary tract infection. To our knowledge, no other human bacteremia driven by this micro-organism has been described.

Here, we report a case of A. veronii biovar veronii septicaemia and acute suppurative cholangitis in a patient with chronic hepatitis B.

Case Report

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of the numerous
Discussion
20 days after admission.
8 h). Clinical and laboratory findings improved dramatically
ciprofloxacin (200 mg every 12 h) and ceftazidime (1 g every
(2 g die) and then, after isolation of the infectious agent, with
The patient was first treated intravenously with piperacillin
additional bands of approximately 50 and 170 kb (data not
resolved DNA bands ranging in size from approximately 10
to 400 kb, while that of the first blood isolate differed by two
second blood isolate and the bile isolate yielded 30 well-
resolved DNA bands ranging in size from approximately 10
and bile isolate differed by two additional bands of approximately 50 and 170 kb (data not
shown).
The patient was first treated intravenously with piperacillin
first- and second-generation cephalosporins (Table 1). Antimicrobial susceptibility patterns were confirmed by the Kirby–Bauer disk diffusion method. On PFGE analysis after
SpeI restriction enzyme DNA digestion, the second blood
isolate was indistinguishable (Dice coefficient 1) from the
first blood isolate. In particular, PFGE profiles of both the
second blood isolate and the bile isolate yielded 30 well-
resolved DNA bands ranging in size from approximately 10
to 400 kb, while that of the first blood isolate differed by two
additional bands of approximately 50 and 170 kb (data not
shown).

The discussion

Of the numerous Aeromonas species, few have been related
unquestionably to human extraintestinal infections, by
virtue of their isolation in pure culture from sterile sites.
Little is known about the exact role played by the newly
described species in human infections, as underlined by the
limited number of reports available in the literature (Janda &

Septicaemia is perhaps the most relevant Aeromonas infection
for severity and frequency and is associated predominately
with several underlying diseases, such as malignancy, hepatic disorders and diabetes (Janda &
Abbott, 1998). Aeromonas hydrophila, Aeromonas caviae and A. veronii biobar sobria are the most frequently involved species (Hanninen & Siitonen, 1995; Janda et al., 1994; Janda &
Abbott, 1998; Ko & Chuang, 1995). Conversely, the role of A. veronii biobar veronii in human septicaemia has been described very rarely. In the first report (Abbott et al.,
1994), A. veronii biobar veronii was isolated from blood
together with Enterobacter aerogenes and Staphylococcus lugdunensis, while, in the second case (Hsueh et al., 1998),
it caused monomicrobial bacteraemia in a patient with
urinary tract infection by A. veronii biobar sobria.

In the present case, A. veronii biobar veronii was responsible for monomicrobial polycyonal bacteraemia, secondary to infection of the common bile duct and biliary tract, which
could represent the primary infectious foci. In fact, the two
isolates from blood showed limited differences in antiimi-

<table>
<thead>
<tr>
<th>Antimicrobial agent</th>
<th>First blood isolate</th>
<th>Second blood isolate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penicillins</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ampicillin</td>
<td>( \leq 32 ) R</td>
<td>( \geq 32 ) R</td>
</tr>
<tr>
<td>Mezlocillin</td>
<td>( \leq 16 ) S</td>
<td>( \geq 128 ) R</td>
</tr>
<tr>
<td>Pipercillin</td>
<td>( \leq 16 ) S</td>
<td>( \geq 128 ) R</td>
</tr>
<tr>
<td><strong>β-Lactam/β-lactamase inhibitor combinations</strong></td>
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<td></td>
</tr>
<tr>
<td>Amoxicillin/clavulanic acid</td>
<td>( \geq 32/16 ) R</td>
<td>( \geq 32/16 ) R</td>
</tr>
<tr>
<td>Cephalosporins I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cephalothin</td>
<td>( \geq 32 ) R</td>
<td>( \geq 32 ) R</td>
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<tr>
<td>Cephalosporins II</td>
<td></td>
<td></td>
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<tr>
<td>Cefamandole</td>
<td>( \geq 32 ) R</td>
<td>( \geq 32 ) R</td>
</tr>
<tr>
<td>Cefuroxime</td>
<td>( \geq 32 ) R</td>
<td>( \geq 32 ) R</td>
</tr>
<tr>
<td>Cefoxitin</td>
<td>( \leq 8 ) S</td>
<td>( \leq 8 ) S</td>
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<tr>
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<td></td>
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</tr>
<tr>
<td>Cefotaxime</td>
<td>( \leq 8 ) S</td>
<td>16–32 ( \geq 2 )</td>
</tr>
<tr>
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<td>( \leq 8 ) S</td>
<td>( \leq 8 ) S</td>
</tr>
<tr>
<td>Ceftriaxone</td>
<td>( \leq 8 ) S</td>
<td>16–32 ( \geq 2 )</td>
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<tr>
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<td></td>
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<tr>
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<td>( \leq 8 ) S</td>
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<tr>
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<td>Meropenem</td>
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<td>( \leq 4 ) S</td>
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<td>( \leq 8 ) S</td>
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<tr>
<td>Aztreonam</td>
<td>( \leq 8 ) S</td>
<td>( \leq 8 ) S</td>
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<td>( \leq 2 ) S</td>
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<tr>
<td>Pefloxacin</td>
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<td>( \leq 2 ) S</td>
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<tr>
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<tr>
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<td>( \leq 2/38 ) S</td>
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<tr>
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<td>( \leq 8 ) S</td>
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<tr>
<td>Chloramphenicol</td>
<td>( \leq 8 ) S</td>
<td>( \leq 8 ) S</td>
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</table>

Values are MIC breakpoints in \( \mu g \) ml\(^{-1}\). R, Resistant; S, susceptible; I, intermediate.
The antimicrobial susceptibility patterns of recently recognized Aeromonas species are not completely known because of the small number of single-isolate cases reported, although a comprehensive susceptibility pattern of 12 A. veronii biovar veronii isolates has been described (Overman & Janda, 1999). In agreement with the above study, the Aeromonas isolates described here were susceptible to aminoglycosides, quinolones, co-trimoxazole and aztreonam but resistant to first- and second-generation cephalosporins. Furthermore, the second blood isolate and the bile isolate were also resistant to piperacillin and showed intermediate susceptibility to some third-generation cephalosporins. This appears to be consistent with the view that Aeromonas species possess both constitutive and inducible β-lactamases responsible for resistance to β-lactamics (Rossolini et al., 1996; Walsh et al., 1997). In addition, the pattern of antimicrobial susceptibility of infectious agents can be related to their different geographical distribution, especially for those of environmental origin. Aeromonas strains from Taiwan have been shown to be more resistant to several antimicrobials than strains from the USA and Australia (Ko et al., 1996); high resistance in environmental Aeromonas species has also been described in Europe (Goti-Urriza et al., 2000). This report confirms that the occurrence of drug resistance in Aeromonas species could be of clinical concern, also involving species generally thought to be susceptible.

In conclusion, this report describes a case of monomicrobial, polyclonal A. veronii biovar veronii septicemia, secondary to acute suppurative cholangitis in a patient with liver disorders and lithiasis. Importantly, the clinical isolates were found to be resistant to different classes of antimicrobial agents, suggesting increased antibiotic resistance in this species and emphasizing that all clinical isolates may require antibiotic susceptibility testing.

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References
