as criteria for accurate identification of bacterial organisms at the species level (8). In this patient, 2 A. rimae isolates were recovered from 2 different blood-culture bottles drawn 48 h apart, suggesting that A. rimae was not just a bypassing organism but indeed responsible for septicemia. In these specimens, S. gordonii was also isolated. Both species have been described as belonging to the oral flora, suggesting that these flora probably were the source for mixed septicaemia in the patient. A. rimae was isolated as the patient was presenting with clinical features of septic shock, suggesting that A. rimae may have contributed to the shock. Antibacterial drug treatment based on in vitro A. rimae susceptibi- lity profile, along with reanimation measures, allowed for the patient’s recovery.

This case report illustrates the usefulness of 16S rDNA sequencing for accurate identification of anaerobic organisms and suggests that A. rimae should be added to the list of organisms responsible for bacteremia in patients.

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References


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Systemic Infection with Enteric Adenovirus in Immunocompetent Child with Haemophilus influenzae Disease

To the Editor: Recent articles have reported enteric human adenovi- ruses (HAdVs) types 40 and 41, previously thought to be restricted to the gastrointestinal tract (1), in multiple organ systems of a deceased immuno- deficient child (2) and in respiratory specimens of children with acute respiratory illnesses (3). Here we present a case in which enteric HAdV-40 was found in the cerebrospinal fluid (CSF) and blood of an apparently immuno- competent child with Haemophilus influenzae invasive disease.

The patient, a 10-month-old previously healthy Thai boy, met the cri- teria for a clinical case of encephalitis (4) and, after informed consent was obtained, was enrolled in the study of causes of encephalitis in Thailand (collaboration between the US Cen-
HAdV DNA was first detected in the CSF specimen collected on December 12, 2003, by an in-house pan-AdV PCR screening assay conducted as part of the study protocol. Amplicon sequences obtained closely matched that of HAdV-40. This unexpected result was confirmed by independent PCR assays on separate aliquots of the same specimen, a broadly reactive real-time TaqMan PCR targeting the hexon gene, and a HAdV 40/41 type-specific real-time Förster resonance energy transfer (FRET) PCR assay targeting the fiber gene. Sequences of the hexon gene hypervariable regions 1–6 that provide type specificity showed a single nonsynonymous base substitution (C→T; Thr→Ile) at nucleotide position 107 of the HAdV-40 prototype strain Dugan (GenBank accession no. DQ115441).

HAdV-40 DNA with identical sequences was also detected in the acute-phase serum specimen also collected on December 12, 2003, but not in the convalescent-phase specimen collected on January 7, 2004. An oropharyngeal swab specimen obtained on December 12 was PCR-negative for HAdV DNA. Although no increase in levels of HAdV antibodies was detected by indirect enzyme immunoassay against pan-AdV antigen, microneutralization assay demonstrated a rise in levels of type-specific neutralizing antibodies to HAdV-40 between the acute-phase (<1:10) and convalescent-phase (1:40) serum specimens.

The results of other testing conducted on the same specimens as part of the study protocol were the following. CSF obtained on December 12, 2003, was negative by broad-specificity PCRs for bacterial 16S RNA and viral agents (alphaviruses, flaviviruses, bunyaviruses, human herpesviruses) as well as by PCR for enteroviruses, herpes simplex virus, Nipah virus, Mycoplasma pneumoniae, and Neisseria meningitidis. CSF was also negative for Cryptococcus spp. by India ink technique. Serum was negative for acute infection with flaviviruses (dengue and Japanese encephalitis viruses); alphaviruses (chikungunya virus); influenza viruses; human parainfluenza viruses 1–3; measles, mumps, and rubella viruses; enteroviruses; Bartonella henselae; rickettsiae (R. typhi, Orientia tsutsugamushi, and R. conorii); and M. pneumoniae. Results of PCR on saliva specimens and serologic testing for rabies were negative; an oropharyngeal swab specimen was negative by PCR for M. pneumoniae; and results of a smear for malaria parasites were negative. The patient was HIV negative.

Detection of HAdV-40 in CSF in this case was confirmed by multiple PCRs with amplicon sequencing. Detection of virus in the acute-phase serum specimen confirms systemic infection and demonstrates that HAdV-40 DNA found in CSF did not arise from contamination of the CSF at the time of collection. Laboratory contamination is also unlikely because the nucleotide sequence of the identified strain (GenBank accession no. FJ228470) was not identical to the prototype reference strain used for positive control in the PCR. Seroconversion to HAdV-40 provides further evidence that this child experienced an acute systemic infection with this virus.

The contribution of HAdV-40 to the clinical illness in this patient remains unclear. He had a confirmed H. influenzae invasive infection, which likely explains the initial underlying illness. However, the detection of HAdV-40 coincided in time with the development of neurologic signs (new-onset seizures, ataxia) and widespread rash. By then, the patient had been receiving antimicrobial drug therapy for several days, his

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Table. Clinical course of illness in 10-month-old boy with systemic infection with enteric adenovirus and Haemophilus influenzae disease, Thailand, 2003–2004

<table>
<thead>
<tr>
<th>Date, 2003</th>
<th>Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec 7</td>
<td>Patient hospitalized with 6-day history of fever &gt;38°C and somnolence; blood culture positive for <em>H. influenzae</em>; isolate not typed (unavailable for further characterization)</td>
</tr>
<tr>
<td>Dec 9</td>
<td>CSF results: pleocytosis (2,710 leukocytes/mm³, 94% neutrophils); protein 178 mg/dL; glucose 11 mg/dL; CSF culture positive for <em>H. influenzae</em>; CSF Gram stain positive for gram-negative coccobacilli; antimicrobial drug treatment (cephtriazone) started</td>
</tr>
<tr>
<td>Dec 11</td>
<td>New onset seizures, ataxia, and maculopapular rash on entire trunk and all extremities; no diarrhea or respiratory symptoms; brain ultrasound scan results within normal limits; anticonvulsant therapy (phenobarbital) started</td>
</tr>
<tr>
<td>Dec 12</td>
<td>CSF results: pleocytosis (100 leukocytes/mm³, 60% neutrophils, 40% monocytes); protein 131.6 mg/dL; glucose 31 mg/dL; CSF bacterial culture, results negative; CSF Gram stain results negative; patient enrolled in the encephalitis study; initial specimens for the study collected</td>
</tr>
<tr>
<td>Dec 22</td>
<td>Brain ultrasound scan results within normal limits; antimicrobial drug treatment (cephtriazone) discontinued</td>
</tr>
<tr>
<td>Dec 23</td>
<td>CSF bacterial culture results negative; CSF Gram stain results negative; anticonvulsant therapy (phenobarbital) discontinued</td>
</tr>
<tr>
<td>Dec 27</td>
<td>Patient discharged in improved condition; discharge diagnosis: <em>H. influenzae</em> meningoencephalitis and sepsicaemia</td>
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<tr>
<td>Jan 7†</td>
<td>Follow-up visit: full recovery without sequelae; convalescent-phase serum specimen obtained</td>
</tr>
</tbody>
</table>

*CSF, cerebrospinal fluid.  †2004.
CSF was negative for 16S bacterial RNA by PCR and culture-negative for H. influenzae, and the CSF pleocytosis had decreased substantially. These circumstances make it less likely that these signs were associated with the underlying H. influenzae disease and raise the possibility that superimposed HAdV-40 infection played a role. Because the patient had no diarrhea or respiratory symptoms, no evidence of immunodeficiency, no stool specimen available for testing, and no evidence of HAdV in throat swab specimen, the pathogenesis of HAdV-40 infection in this case is unknown. The origin of the maculopapular rash concurrent with neurologic symptoms in this patient is also unclear. Rash is not typical for H. influenzae infection and, although reported for some HAdV infections (7), has not been previously described for HAdV-40/41.

In conclusion, this case demonstrates the possibility of nongastroenteric, systemic infection involving CNS with enteric HAdV in immunocompetent hosts. Broad-specificity AdV PCR assay followed by amplicon sequencing enabled detection of this pathogen in an unexpected context and can be useful in defining the nongastroenteric disease effects associated with the enteric HAdVs.

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References


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Mesotherapy-associated Outbreak Caused by Mycobacterium immunogenenum

To the Editor: Mesotherapy, a procedure for medical and cosmetic treatment, involves use of microinjections of different biologically active substances into the dermis or subcutaneous adipose tissue. This controversial practice is used for spot contouring and anti-aging therapy. Concerns have been raised about mesotherapy complications, such as sereptic subcutaneous necrosis and cutaneous nontuberculous mycobacterial infections. Several rapidly growing mycobacterial species, primarily Mycobacterium fortuitum, M. peregrinum, M. chelonae, M. abscessus, M. simiae, and the newly described M. massiliense, M. bolletii, and M. cosmeticum (1–5), have been reported to cause infections and outbreaks originating from use of contaminated injectable solutions or skin antiseptics during mesotherapy and other invasive cosmetic procedures. We describe a mesotherapy-