The patient had mild thrombocytopenia (platelet count 123 × 10^9 platelets/L) and leukopenia (leukocyte count 2.75 × 10^9 cells/L; reference range 4–10 × 10^9 cells/L) with associated stimulated lymphocytes, and discreet hepatic cytolysis (aspartate aminotransferase 55 IU/L; reference value <34 UI/L, and alanine aminotransferase 51 IU/L; reference value <55 IU/L). Serum was analyzed by using real-time reverse transcription PCR (RT-PCR) and was positive for ZIKV as recommended by Lanciotti et al. (5) and DENV-3.

Patient 2 was a 38-year-old woman who had fever (40°C), headache, arthralgia, asthenia, and myalgia. No hemorrhagic or neurologic findings were reported, but signs of illness lasted ≈1 week. The patient had mild thrombocytopenia (platelet count 123 × 10^9 platelets/L) and leukopenia (leukocyte count 2.65 × 10^9 cells/L). Serum was analyzed by using RT-PCR (5) and was positive for ZIKV and DENV-1.

Co-infections were assessed by sequencing partial ZIKV membrane–envelope gene regions for isolates (GenBank accession nos. KM212963 and KM212967) from both patients, partial DENV-1 envelope gene for an isolate (KM212960) from patient 2, and partial DENV-3 nonstructural protein 5 gene for an isolate (KM212962) from patient 1. Sequencing was conducted at La Plateforme du Vivant (Noumea, New Caledonia).

DENV-1 sequence obtained belonged to genotype I and clustered with DENV-1 sequences isolated in New Caledonia (2). DENV-3 sequence obtained belonged to genotype III, similar to DENV-3 recently isolated in French Polynesia (9). ZIKV sequences obtained belonged to the
Asian lineage and had 99% identity with sequences of ZIKV isolated in French Polynesia in 2013 (10).

Serum specimens from both patients were cultured on vero cells, and supernatants were evaluated by RT-PCR. Each specimen was positive only for DENV, which was probably caused by low viral loads for ZIKV.

We report co-infection of 2 patients with DENV and ZIKV; each patient was infected with a different DENV serotype. No synergistic effects of the 2 viral infections were observed because both patients were not hospitalized and recovered after a mild clinical course.

During this outbreak, patients in New Caledonia were tested for DENV, chikungunya virus, and ZIKV within the framework of the arboviruses sentinel network, which enabled detection of co-infections. Thus, clinicians should be aware of infections with multiple pathogens in the differential diagnosis of dengue-like illness, especially in patients who returned from tropical regions. This diagnostic procedure could be improved by using multiplex RT-PCR for travelers, given the frequent co-circulation of multiple arboviruses in tropical regions.

Acknowledgments
We thank C. Goarant for providing scientific advice and critically revising the manuscript and D. Baudon for providing scientific support.

This study was supported by the Institut Pasteur and the New Caledonia Government.

References

Address for correspondence: Myrielle Dupont-Rouzyrol, Unité de Recherche et d’Expertise–Dengue et autres Arboviroses, Institut Pasteur de Nouvelle-Calédonie, 9–11 Ave Paul Doumer, BP 61, 98845 Noumea, New Caledonia; email: mdupont@pasteur.nc

Fatal Meningoencephalitis in Child and Isolation of Naegleria fowleri from Hot Springs in Costa Rica

Elizabeth Abrahams-Sandi,
Lissette Retana-Moreira, Alfredo Castro-Castillo,
Maria Reyes-Battle, Jacob Lorenzo-Morales


DOI: http://dx.doi.org/10.3201/eid2102.141576

To the Editor: Primary amebic meningoencephalitis (PAM) is an acute and fulminant disease caused by Naegleria fowleri, an amphiocic ameba belonging to the family Vahlkampfiidae. About 235 PAM cases have been described worldwide, most in children and immunocompetent young adults (1,2). The infection occurs through the nose; the ameba enters through the nasal passages and ascends the olfactory nerve until it reaches the olfactory bulb of the central nervous system. The incubation period for PAM ranges from 5 to 7 days, and infection leads to death within a week. Symptom onset is abrupt, with frontal or bitemporal headaches, fever, and stiff neck, followed by nausea, vomiting, irritability, and fatigue. The mortality rate is as high as 95%; few cases of survival have been reported (2,3).