Fatal Legionella maceachernii Pneumonia

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Legionella maceachernii, previously isolated only from the environment, was shown to be a cause of fatal pneumonia in an immunocompromised patient.

Legionella maceachernii is a newly described species that was isolated initially from a potable water cistern (1). Antiserum to isolate PX-1-G2-E2 (ATCC 35300) was produced in rabbits, absorbed with Legionella anisa cells, and used with antisera to the 32 other serogroup strains of Legionella spp. (2) to test Legionella-like organisms received for identification at the Centers for Disease Control, Atlanta, Ga. As described below, L. maceachernii has now been isolated from a patient with fatal Legionella pneumonia.

The patient, a 54-year-old man with multiple myeloma, was admitted to the University Medical Center, Tucson, Ariz., with a 2-day history of fever, nausea, and diarrhea. His lungs were initially clear by physical examination and chest X ray, but during his first 3 days of hospitalization he developed respiratory difficulties that correlated radiologically with a progressive right lower lobe pneumonia and pleural effusion. Initial antibiotic therapy included cephaloridine, tobramycin, and ticarcillin. On day 3, intravenous erythromycin, 4 g per day, was started to treat possible legionellosis. Initial cultures of blood, sputum, urine, cerebrospinal fluid, and stool failed to reveal an etiologic agent. A transtracheal aspirate was obtained with negative results, including culture for Legionella spp. on buffered charcoal-yeast extract agar. Direct immunofluorescence assays were not performed because of an insufficient quantity of specimens. By day 6, there was no resolution of the pneumonia, and spiking fevers continued. Amphotericin B and trimethoprim-sulfamethoxazole were added, and cephaloridine, ticarcillin, and tobramycin were discontinued from the treatment regimen. On day 13, the respiratory difficulties of the patient suddenly increased, with frank bleeding from the upper respiratory tract, and he died.

At autopsy, the most prominent findings were bronchopneumonia with focal organization and hemorrhage in the right lung. Lung cultures yielded gram-negative bacilli which grew aerobically on buffered charcoal-yeast extract but not on blood or chocolate agar. The organisms resembled Legionella spp. but failed to stain with Centers for Disease Control direct immunofluorescence conjugates to Legionella pneumophila serogroups 1 to 6, Legionella micdadei, Legionella longbeachae serogroups 1 and 2, Legionella gormanii, Legionella dumoffii, or Legionella bozemanii. Viral cultures of the lung yielded cytomegalovirus. Short bacilli which were not shown to methenamine silver, acid-fast, or Gram-stain methods were observed with Dieterle silver stains of the lung tissue. The Legionella-like organism was sent to the Arizona Department of Health Services, Phoenix, which forwarded it to the Centers for Disease Control after verifying the above results.

At the Centers for Disease Control, a single-colony pick of the Legionella-like organism was grown on buffered charcoal-yeast extract agar and tested for typical Legionella spp. phenotypic and genotypic characteristics. Tests were positive for catalase, oxidase, gelatinase, flagella, and production of brown pigment on tyrosine-containing agar. Results were negative for autofluorescence, beta-lactamase, hippurate hydrolysis, carbohydrate fermentation, urease, and nitrate reduction. DNA hybridization reactions identified the Legionella-like organism as L. maceachernii (1), with 90% relatedness to the type strain of L. maceachernii, PX-1-G2-E2. Gas-liquid chromatographic profiles were consistent with those for PX-1-G2-E2 (William R. Mayberry, personal communication). The isolate agglutinated strongly with Legionella maceachernii antiserum but not with antiserum to any other known Legionella species and serogroup (2).

These results show that L. maceachernii is another Legionella species isolated initially from environmental specimens and shown subsequently to be a human pathogen when tests were available to identify it.

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LITERATURE CITED


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