

Laboratory and Epidemiology Communications

A Fatal Case of Weil's Disease in Miyagi Prefecture

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Leptospirosis is characterized by acute infection with fever, jaundice, and hemorrhage. The causative agent is released from the urine of field mice and infects human through contact with skin. The infection is endemic in various parts of the world (1,2), including Japan (3,4). In the past 3 years, leptospirosis has increased in Yamagata and Niigata Prefectures (unpublished data). In Miyagi Prefecture, leptospirosis cases have remained few (3).

A 45-year old farmer living in the northern region of Miyagi Prefecture visited a clinic close to his home with fever, headache, and loss of appetite which started on September 27 of 1999. He worsened, experiencing jaundice and kidney failure, and went to another hospital on October 1. His condition deteriorated further, and, 2 days later, he was in shock, his

blood pressure was 60-70 mmHg, and he had difficulty breathing. He was sent to a general city-hospital. Clinical examination revealed high proteinuria, high bilirubinemia, and severe liver dysfunction, which characteristics are typical of leptospirosis. Increased white blood cell count, and decreased red blood cell, platelet, and hemoglobin counts were noted. There was a hemorrhage in the lung, and respirator control and blood transfusion were started. The patient's condition deteriorated, and he died by multiple organ failure on October 4.

Antibody titers against *Leptospira copenhageni*, *L. autumnalis*, *L. hebdomadis*, and *L. australis* were measured by the microscopic agglutination test (1-3). The leptospira microorganisms were cultured in modified Korthof's medium at 30°C for 5 days, and leptospira suspensions adjusted to 10⁸ live microorganisms per ml were used for the agglutination test. Agglutinated leptospira microorganisms were detected by PCR amplification of the leptospira gene (5).

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In the blood specimens of October 4, a leptospira agent was detected by microscopy. In the blood and cerebrospinal fluid of October 4, the leptospira genome was detected by PCR. The difference in antibody titers against *L. copenhageni* between the October 2 and October 4 specimens was fourfold. The causative agent was thus conclusively diagnosed as *L. copenhageni*.

Leptospirosis was endemic until the 1970s in the northern region of Miyagi Prefecture; 822 patients (35 died) were reported in 1959, 407 patients in 1961, and 17 patients in 1975 (3). The cases decreased dramatically, and most recent patient was recorded in 1987 (the last decreased case was in 1983). This decrease was probably brought about by vaccination and wider use of farm machinery. It should be noted that the leptospira infection rate in captured wild rats in the 1960s was similar to that in the 1990s in Miyagi Prefecture (3). In addition, since the revision of vaccination law in 1995, fewer and fewer farmers have been receiving the leptospira vaccination. Issuing warnings about persistent leptospira in wild rats and encouraging leptospira vaccination among moderate to high risk groups should be recommended.

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