

Epidemiology & Public Health Bulletin

155 Murine (Endemic Flea-Borne) Typhus Fever — A Case Report
159 Cases of Notifiable and Reportable Diseases, Taiwan-Fukien Area

Murine (Endemic Flea-Borne) Typhus Fever — A Case Report

The patient, a 73-year-old retired serviceman, currently unemployed, had been under regular medication for 17 years for *Diabetes mellitus*. Eighteen months prior to admission, he had developed cortical aphasia from temporal area cerebrovascular accident. Several months later, his neurological functions recovered and was without significant sequelae. Then, two weeks before admission he developed a dry cough for which he received treatment as an outpatient. Though a chest X-ray showed mild infiltration of the lower parts of both lungs, the dry cough stopped after several days of medication.

Six days before admission, the patient had had appetite loss, and postprandial vomiting. The following day, sporadic pain occurred in the left upper abdomen. Two days later, unbearable and incessant abdominal pain developed. Two days before admission, the patient visited the Emergency Department for treatment. Examination showed with a clear consciousness, but in acute illness; body temperature, 39.5°C; blood pressure, 169/105 mmHg; pulse, 81/minute; respiration, 18/minute; no anemia, jaundice or lymphadenopathy; clear breathing sounds; no cardiac murmur; soft abdomen; no hepatosplenomegaly, but with distinct pressure pain of the left upper abdomen. Bowel sounds were normal, as all other systems as well. Blood tests showed white cells, 6,720/cumm; neutrophil, 60%; lymphocyte, 29%; monocyte, 10%; hemoglobin, 14.5 gm%; hematocrit, 39.6%; platelet, 113,000/cumm. Urinalysis showed normal, with blood sugar of 212 mg/dL. Liver function showed moderately abnormal, GOT, 66 U/L (normal value: 5-45); GPT, 40 U/L (0-40); Alp 71 U/L (10-95); LDH 197 U/L (95-205). His renal function was normal, K 4.5 mmol/L and Na 126 mmol/L (Later testing of blood and urine for sodium concentration and osmolarity confirmed the syndrome of inappropriate ADH secretion (SIADH); amylase was 5 U/L. Gastroscopic findings showed both gastric and duodenal ulcers. Abdominal sonography and CT scan were normal. At admission on 13 January 1995, the patient's principal complaints were incessant fever and left abdominal pain., the latter having been suffered over a five-day period. A pinkish rash then erupted over his body. Judged to be a typhoid fever case, the patient was given ceftriaxone intravenously. Serum specimens were sent to the Department of Health (DOH) National Institute of Preventive Medicine for testing. It should be noted that this resident of the Fengshan area never traveled abroad, had had no contacts with animals and reported that he had never been bitten by insects.

Later, bone marrow biopsy, Gallium scan for inflammation study and Barium enema study were all normal. Blood culture was negative for bacteria; *Legionella pneumophila* and *Mycoplasma pneumoniae* were negative. Disseminated Intravascular Coagulation (DIC) testing was positive. The rash disappeared on the second day, but the patient's general condition had not improved six days after admission. Clinical diagnosis could not exclude the possibility of rickettsial infection. Tetracycline was administered orally 500 mg every six hours. The fever disappeared and abdominal pain improved after the second dose. Three days later, with the exception lethargy and anorexia, the patient was in relatively good condition. He was discharged 13 days after admission, on 25 January, though tetracycline was continued for 18 more days. On 27 January, the National Institute of Preventive Medicine was able to confirm the case as typhus fever: (IFA Testing)

Results of paired serology study by indirect fluorescent antibody testing

Blood collected on:	Louse-Borne		Flea-Borne	
	IgG	IgM	IgG	IgM
14 Jan 1995	40	40	160	40
19 Jan 1995	640	40	1,280	40
25 Jan 1995	2,560	40	5,120	40

Discussion

Typhus fever is one of the rickettsial diseases, exhibiting as two types: louse-borne and flea-borne⁽¹⁻⁴⁾. Epidemic, or louse-borne, typhus is notifiable in Taiwan. The pathogen, *Rickettsia prowazekii*, is transmitted from person to person by the body louse, *Pediculus humanus corporis*. The louse feeds on an infected, rickettsemic patient. The organism in the louse infects its alimentary tract and results in large numbers of organisms in its feces within about 1 week. When the louse takes a blood meal, it defecates. The irritation causes the host to scratch the site, thereby contaminating the bite wound with louse feces. Inhalation of dried louse feces in dust may also induce infection. Infection occurs more often in winter, in time of war or disaster, and under any crowded conditions in which lice are apt to thrive. The incubation period is about one week. Clinical symptoms including abrupt onset with intense headache, chills, fever and myalgia are characteristic. There is no eschar. A rash begins in the axillary folds and upper part of the trunk on the fifth day of illness and spread centrifugally to the entire body but spares the face, palms and soles. However, 10% of the patients with the disease may not have eruptions. Other rare symptoms include a dry cough and pulmonary infiltration, deafness or delirium. In untreated, uncomplicated louse-borne typhus, the fever lyses after 2 weeks of illness, but recovery of strength usually required a prolonged convalescence (two to three months). Overall mortality rate is around 10 to 60%. Weil-Felix reaction with *Proteus* OX-19 is often used in the clinical diagnosis.

though indirect fluorescent antibody-(IFA) is the most sensitive and differentiating diagnostic method currently available. *R. prowazekii* and *R. typhi* share a common antigen, and IFA cannot differentiate between them. Recommended treatment is tetracycline 25 mg/kg/day or chloramphenicol 50 mg/kg/day, continued for two to three days after the fever has disappeared. When antibiotic treatment begins very early after onset (within 48 hours), an occasional patient will relapse. The recurrent illness responds to a second course of therapy.

The etiologic agents of the murine or endemic (flea-borne) typhus, *R. typhi*, is transmitted by means of rat fleas, *Xenopsylla cheopis*, which defecate rickettsiae when sucking blood, contaminating the bite site or other fresh skin wounds. Infection occurs more often in summer or early autumn, around April and June. The clinical course resembles that of epidemic (louse-borne) typhus but tends to be milder. Fatality is around 1 to 4%. Only 18 to 50% of patients will have eruptions. Other clinical manifestations may include neurologic symptoms in some patients. Clinical diagnosis and treatment are similar to those of the louse-borne typhus.

This case initially presented with atypical symptoms: a dry cough, vomiting and severe abdominal pain, followed by the more typical high fever, eruption, low platelet count, low blood sodium and mild abnormal liver function. Clinical differential diagnoses could have included typhoid fever, dengue fever, secondary syphilis, scrub typhus, rubella, infectious mononucleosis, Legionellosis, drug rashes, meningococcal meningitis and *Spirochaeta gracilis* infection. There has never been louse-borne typhus infection in Taiwan. Flea-borne typhus occurred in Taiwan during wartime and soon thereafter but, with improvements in environmental sanitation, few subsequent cases have been reported. In the last five years, one case was reported in Taipei City in 1991⁽⁵⁾ and another, in Kaohsiung County in 1992⁽⁶⁾. The serum of this present case was sent to the National Institute of Preventive Medicine for Q fever and scrub typhus testing. An additional, and accidental, test for typhus fever confirmed that diagnosis. Tainan's National Chengkung University Hospital, however, through the screening of the sera of 113 out-patients in southern Taiwan, found that the flea-borne typhus antibody positive rate was 23.9%⁽⁷⁾. It seems this infection is under-reported in Taiwan. Medical practitioners should be more alert to the possibility of these diseases in order to improve the rate of early diagnosis, thus promoting early, effective treatment.

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