

Epidemiology **B**ulletin

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Death Case Report of Scrub Typhus

On July 28, 1987 a 64-year-old female was admitted to Taipei Veterans General Hospital through emergency service due to acute renal failure. Physical examination during admission revealed a mild degree of hepatomegaly, ascites, anemia and jaundice; slight engorged jugular vein; second-degree systolic murmur over apex; moist rales over both lower lung fields; pitting edema on both lower legs. Vital signs were within the normal limit. Laboratory examinations showed abnormal liver and renal function, occult blood (+++) in stool, and E coli in urine; but negative findings in blood culture. Chest X-ray revealed slight cardiomegaly and lung congestion. Deminished electrical potential in pedal leads was also found in EKG.

Patient's response to the administration of diuretics and digitalis was generally good, but poor renal function still persisted. Penicillin was administered on July 30 due to a sudden onset of high fever. Doxycycline, 100 mg every 12 hours, was given after the consultation with the Division of Infectious Disease on July 31 for suspected scrub typhus. GI bleeding, hypotension, disturbed consciousness, respiratory and metabolic alkalosis were noticed in the early morning of August 1. Emergency gastroendoscopic examination revealed generalized blood oozing in the gastric mucosa. Blood pressure was stabilized by blood transfusion and cardiotonics. Unfortunately, one of the patient's family members insisted on giving up therapy and discharged the patient against advice the morning of August 1 when patient's condition deteriorated and she went into a coma. Patient died that afternoon at her home.

Patient had a past history of mild renal function impairment for six years with occasional pitting edema of her lower extremities. According to the statements of her close friends, patient had a 2-day-tour to Penghu County the middle of June and suffered from insect bites on her forehead and right breast. Poor healing of the wounds with eschar, lymphadenopathy of right axilla, oliguria and general malaise were noticed. Patient joined another tour to Central Taiwan in early July without

any special complaints. On July 16 patient complained of severe general malaise and sought medical attention. High fever, generalized edema, anorexia, nausea and oliguria were noted on July 17. Patient was admitted to a local hospital on July 27 due to suspected uremia, hepatic and heart failure. Patient had been attended by four different physicians before she was transferred to Taipei Veterans General Hospital. A scrub typhus IFA test on blood sample collected before patient expired revealed that the mixed titer (IgG, IgA and IgM) of both Karp and Kato strains were 1:1280, Gilliam strain was as high as 1:2560, and the IgM antibody titer of the above three strains was $1 \cdot \geq 640$. This confirmed the diagnosis of scrub typhus associated with acute failure of multiple organs.

The results of the scrub typhus IFA tests done in August on patient's eight family members were all negative. The specimens received in September from those accessible tour members of the two tour groups which victim had joined for travelling to Penghu County and central Taiwan (47 out of 50 and 45 out of 46 respectively) all showed negative results on the scrub typhus IFA test.

According to the above provided information, patient was newly infected with scrub typhus. The time and place of infection was most probably during the 2-day tour to Penghu County the middle of June. The exact and underlying causes of death are unknown ---- whether failure of the multiple organs was caused by the scrub typhus infection or the co-exist coincidental co-existence of the both complaints was unable to be solved since an autopsy was not performed.

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Editorial Notes: Scrub typhus, also known as Tsutsugamushi disease, is widely distributed in the Asian-Pacific area. The disease is spread by the bite of infected mites. Lan-Yu Island, Penghu and Hualien Counties are the areas in Taiwan where the infection is most common found. The disease is endemic and has been extensively studied on the Penghu (Pescadores) Islands¹⁻³. The patient usually does not notice the bite of an infected mite. The incubation period is normally 10 to 20 days. Initial symptoms include severe headache, fever, chills, conjunctivitis, anorexia, and painful lymphadenopathy. A 2-4 mm, dark, firmly adherent eschar forms around the initial site of the bite. These eschars are frequently overlooked except on careful physical examination. A maculopapular rash appears on the trunk and extremities after six or seven days. Without treatment, the fever lasts for about two weeks. Complications of severe cases include melena, coma, pneumonia, cardiac and renal failure. The diagnosis is confirmed by inoculating mice with the patient's blood and isolating the rickettsia organisms. The most commonly-used serologic tests are the Weil-Felix agglutination of Proteus OXK strain and IFA test. Although both tests have low sensitivity, the probability of a correct diagnosis in a patient with both an OXK titre of $> 1:320$ and an IFA titre of $> 1:400$ is 96%⁴. The treatment of choice is tetracycline. Response to therapy is prompt, usually within 24-48 hours. With adequate treatment, mortality is $< 1\%$. The latest report of a scrub typhus case resulting in death in the Taiwan Area was in Hualien County during 1970⁵. There are typical and atypical scrub typhus infections regarding the symptoms and signs⁶. It had been overlooked and treated by clinical physicians in non-endemic areas as common cold, rubella and pulmonary TB⁷. Differential diagnosis include rickettsia infection, typhus, typhoid fever, brucellosis, leptospirosis, toxoplasmosis, infectious mononucleosis and dengue fever. Physicians throughout the Taiwan Area, especially those who practise in non-endemic areas, should be aware of both typical and atypical types of scrub typhus and elicit appropriate travel histories from patients complaining of prolonged fever. Blood sampling for a Weil-felix or IFA test should be done on any suspected case. A 3-5

cc blood specimen of the acute stage accompanied with clinical history should be sent to the Division of Bacteria of the Taiwan Provincial Institute of Infectious Disease (Tel: (02) 785-6229) for free serologic confirmation. The following treatment of choice should be considered if patient has no condition of contra-indication:

- 1 Tetracycline 25mg/Kg of body weight per day, or
- 2 Chloramphenicol 50mg/Kg of body weight per day in 4 divided oral doses for 3 to 7 consecutive days.
3. Single dose of 200mg Doxycycline.

Response to therapy is prompt, usually within 24-48 hours. For prevention of recurrent, the administration of tetracycline for 7 days, single dose of doxycycline or two doses of doxycycline (5 days apart) are recommended.

For people who have to stay temporarily or transit through endemic areas, the following methods of prevention are recommended:

- 1 Avoid contact with infected mites by impregnating clothes and blankets with miticidal chemicals (benzyl benzoate) and an application of mite repellent (diethyltoluamide) to exposed skin surfaces
- 2 Single dose of Doxycycline 200mg orally if no contra-indication. One dose per week if the trip lasts longer than one week¹⁰.
3. Individuals who have just travelled or stayed temporarily in endemic areas (Penghu, Hwalien and Taitung Counties) should provide a detailed travel history to their attending doctor if they need medical consultation.

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