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Epidemiology of Tsutsugamushi Disease and Japanese Spotted Fever in Kagoshima Prefecture, Japan

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Tsutsugamushi disease is caused by infection with *Orientia tsutsugamushi*, whose vector is a chigger. Japanese spotted fever is caused by *Rickettsia japonica*, whose vector is *Acarina*. Both infections are classified as Category Four infectious diseases under the Japanese Infectious Disease Law (1,2).

In 2004, Kagoshima Prefecture reported 54 cases of tsutsugamushi disease, the highest frequency in Japan, accounting for approximately 18% of the total 296 cases in Japan. Japanese spotted fever cases in Kagoshima Prefecture numbered 11 in the same year, accounting for 16% of the total 67 cases in Japan, and giving the third highest frequency of all the prefectures.

Our institute conducted serological investigations using the immunofluorescence (IF) method on 48 tsutsugamushi patients in 2004 and on 48 Japanese spotted fever patients from 2000 to 2004. The *O. tsutsugamushi* antigens used were the standard Kato, Karp and Gilliam strains as well as the Kawasaki and Kuroki strains that frequently occur in southwest Japan. For *R. japonica*, we used an antigen of the YH strain.

We found that tsutsugamushi disease occurred most frequently from October to April, while Japanese spotted fever arose most often from April to December. Tsutsugamushi cases were most frequently seen among people in their 60s, and the male to female ratio was 9:7. Japanese spotted fever was most prevalent among people in their 70s, and the male to female ratio was 3:5. For both infections, 90% of the suspected places of infection were mountainous (60%) and flat (30%) rural areas, and half of the cases were associated with agricultural activities.

The Kagoshima Prefecture government has been promoting the prevention of infection through its information services. Such activities are continuously needed because the risk of infection is associated not only with forestry activities but also with agricultural, leisure and other activities that take place in flatland areas and even in residential zones.

Tsutsugamushi disease has been found diffusely in Kagoshima Prefecture, while Japanese spotted fever is generally localized on the Osumi Peninsula in the eastern part of the

prefecture. Further analysis on the geographical distribution of the diseases, the active seasons of the insect vectors and their relation to infections in humans, etc., will be necessary in order to effectively plan preventive measures (3). While the two infections share similar symptoms, Japanese spotted fever sometime causes serious complications such as disseminated intravascular coagulation (4 cases among our 48 patients). Since fatal cases of Japanese spotted fever have been reported every year in other prefectures, early diagnosis and early medical treatment are critically important.

Intensified rickettsia control should include the isolation of rickettsiae in *Acarina* and other ticks parasitizing wild rodents and further investigation on pathogens involved in fevers whose origin is unknown using paired serum testing. Early diagnosis should include not only laboratory diagnosis such as immunological diagnosis using antigens of rickettsiae isolated in Kagoshima Prefecture but also polymerase chain reaction diagnosis.

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