

Laboratory and Epidemiology Communications

Annual Incidence of Tsutsugamushi Disease Caused by Different Serotypes of *Orientia tsutsugamushi* in Miyazaki Prefecture in 1991-1999

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There was a rapid increase of *Orientia tsutsugamushi* infection in various parts of Japan in the latter half of the 1970's (1). Also in Miyazaki Prefecture, the incidence of infection started to increase around 1980, and, in 1985, 189 cases were reported. We report here the annual incidence of *O. tsutsugamushi* in 1991-1999 in Miyazaki Prefecture.

IgM and IgG antibodies were assayed by indirect immunofluorescent antibody technique (2) by using the standard strains (Gilliam, Karp and Kato strains) and clinical isolates of Kawasaki and Kuroki strains as antigens. All strains were grown in L929 cells. Kawasaki and Kuroki strains were isolated in 1981 in Miyazaki Prefecture (3-4). An increase in antibody titers during disease progression or a single acute phase serum, whose IgM titer was higher than 1:40 and also higher than the IgG titer, were both used as criteria for confirmed cases. If a serum sample produced a titer to a particular antigen that was double that of other antigens, the serum was considered to be specific to the antigen.

Cases fulfilling the following criteria were considered to be clinical Tsutsugamushi disease, even if the serum was antibody-negative, i.e., if fever and rash and/or a lesion from a mite bite were observed, and if the onset of disease was from October to February, and if the serum was obtained within 10 days after the onset of disease.

A total of 679 cases were reported in the period between April of 1991 to March of 1999. Among them, 576 cases were confirmed by serodiagnosis (Fig. 1A). Three hundred

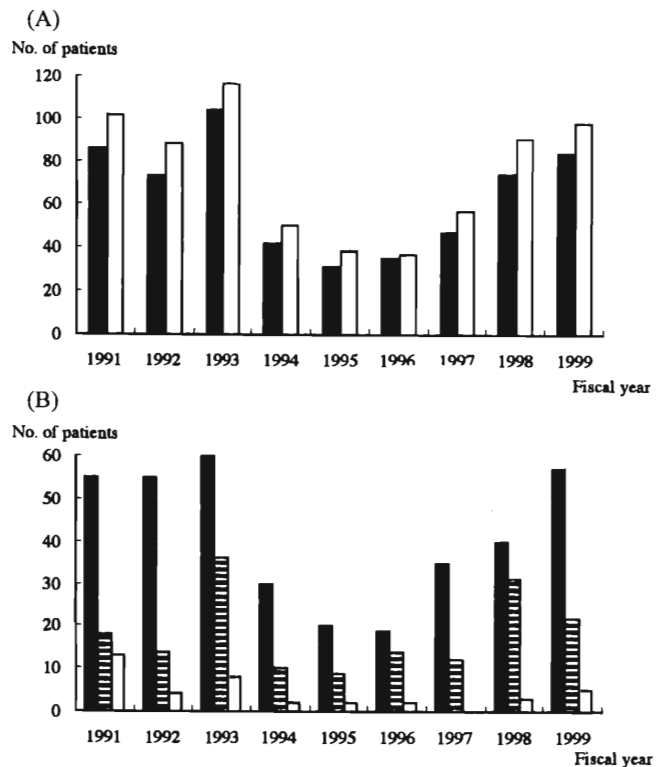


Fig. 1. Annual incidence of Tsutsugamushi disease in Miyazaki Prefecture. (A) Sum total of clinical and confirmed cases (open bars) and confirmed cases (closed bars). (B) The incidence according to serotypes; sera reacting with Kawasaki type (closed bars), sera reacting with Kuroki type (shaded bars) and sera reacting with multiple antigens (open bars).

Table. Monthly fluctuation of Tsutsugamushi disease in Miyazaki Prefecture in 1991-1999

Antigenic Type	Kawasaki	Kuroki	Multiple Reactive
September	0	1	0
October	27	13	2
November	219	89	19
December	114	48	12
January	10	7	1
February	1	6	2
March	0	1	3
April	0	1	0
Total	371	166	39

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seventy-one (64%) people were infected with Kawasaki type and 166 (29%) with Kuroki type; infections in the remaining 39 patients were difficult to classify because the sera reacted with multiple antigens (for the classification of this last group, genomic analysis of isolates was necessary) (Table). In 1985-1988, 74% of the patients were infected by Kawasaki type and 22% by Kuroki type (2). Therefore, the overall pattern of infection has remained unchanged in the past 15 years. The fluctuation of the total incidence was largely influenced by that of Kawasaki type. Kuroki type was less common in

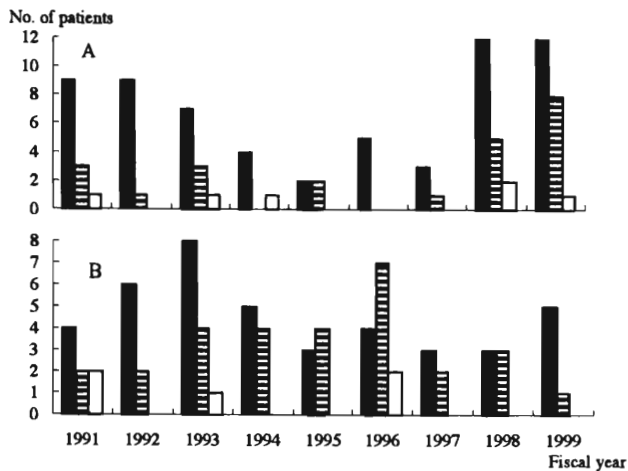


Fig. 2. Annual incidence of Tsutsugamushi disease in two endemic areas in Miyazaki Prefecture, the areas of Kobayashi (A) and Miyakonojo (B). Closed bars: sera reacting with Kawasaki type; shaded bars: sera reacting with Kuroki type; open bars: sera reacting with multiple antigens.

general, but was relatively frequent in 1993, 1998, and 1999 (Fig. 1B).

There are two regions, Kobayashi and Miyakonojo, endemic for Tsutsugamushi disease. However, the annual fluctuation was not identical in the two regions (Fig. 2). It is probable that the distribution and/or propagation of *Leptotrombidium scutellare*, a known vector of Kawasaki and Kuroki types of *O. tsutsugamushi* (5), differed in these two regions. The patients were diagnosed in a cluster in November

and December (Table). Seventy-three percent of the patients were more than fifty years of age, reflecting the average age of the population in the endemic region.

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Acute Hepatitis Outbreak in Tokyo Caused by Hepatitis A Virus of Common Origin Transmitted through Oral and Sexual Routes

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Hepatitis A virus (HAV) is transmitted by fecal-oral routes. Outbreaks can occur in families (1) and among homosexuals (2). Infection acquired by ingestion of infected clams or oysters is frequent (3). Japan experienced large outbreaks in 1990 and 1991. One hundred and eighty-seven cases were reported at

national hospitals in 1990 and 115 cases were reported in 1991. The number of HAV cases gradually declined after 1991 and in 1995-1998, only 20-50 cases were reported annually.

In 1999, an unusually large number of HAV-infected patients visited our clinic: three patients were seen in January-March, four patients in May-June, five patients in July-September, and two patients in October-December. Patients' clinical

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