

Epidemiology Bulletin

REPUBLIC OF CHINA

– Contents –

93 Preliminary Report of Outbreak Investigation on Dengue Fever in South Taiwan

International Notes:

98 International Case Number of AIDS – Data as at 30 September 1987

99 General Announcement

Preliminary Report of Outbreak Investigation on Dengue Fever in South Taiwan

On November 19, Bureau of Disease Control received a report from the Taipei City Health Department that a suspected case of dengue fever was hospitalized since November 5 due to prolonged fever, general rash, pruritus, swelling and erythema of extremities. Patient had spent a week of reunion holiday in her home town (Tungkang of Pingtung County) in southern part of Taiwan. Serum specimen had been sent to Taiwan Provincial Institute of Infectious Disease (TPIID) for confirmation. All units of health and environmental protection in Taiwan Area had started measures of prevention and control on dengue fever since November 20. Kaohsiung City Health Department also reported a clustering of suspected cases in the area next to Tungkang on November 21.

100 randomly selected households in both Tungkang of Pingtung County and Sammin District of Kaohsiung City were investigated by Department of Health. A total number of 812 inhabitants were interviewed. Person was suspected suffering from the disease under the case definition of any patient with fever, headache and any one or more of the following symptoms: rash, myalgia, arthralgia, generalized pruritus. The attack rate was 13.5% (110/812). Clinical symptoms include fever (100%), headache (83%), myalgia (71%), rash (54%), arthralgia (49%) and generalized pruritus (45%). Sex ratio of attack rate was M.F=1:0.75 and all age groups were affected. The median of age by sex were 21 years old in male and 31 years old in female. The attack rates of female whose age ranged from 30 to 59 (majority are housewife) were comparatively higher than the rest of the other age group (Figure 1). No clustering phenomenon of infecting sites were observed. Earliest date of infection could be traced back to the middle of October and was first seen in Tungkang

of Pingtung County. It spread to the Kaohsiung City four weeks later (Figure 2). Suspected cases from other cities or counties were also reported and all these sporadic cases had a common history of mosquito bites while they stayed or traveled in southern Taiwan especially in Kaohsiung City or Pingtung County. No specific high risk factor that associated with this outbreak was identified. TPIID had already isolated the dengue virus (antigen serotype 1) from captured *Aedes*. The antigen serotype of human patient is still under identification. In order to expedite the data collection and response in the prevention and control of this outbreak, all medical and health units were instructed to report all cases through telephone daily instead of normal formality.

Reported by: Drs. Kuo-Tung Chen, Mon-Yin Chau, Michael Malison, Field Epidemiology Training Program, Department of Health; Taipei City Health Department; Taiwan Provincial Institute of Infectious Disease, Taiwan Provincial Health Department, Sammin District Health Center, Kaohsiung City Health Department; Tungkang District Health Center, Pingtung County Health Department; Southern Mobile surveillance Team, Bureau of Disease Control, Department of Health.

Editorial Notes: Dengue fever, also known as breakbone fever, is caused by the infection of dengue virus which belongs to Flaviviruses of Arboviruses. *Aedes aegypti* and *albopictus* are the main vectors. Human beings are the main reservoir of dengue virus but will not infect others through close contact. *Aedes aegyptis* and *albopictus* become infectious after 8-11 days of being infected and the infectious ability will last for their whole life. The incubation period of human lasts 3-15 days (normally 5 to 6 days). Symptoms and signs include acute attack of high fever, chilliness, headache, myalgia, post-orbital soreness, arthralgia and rash. High fever may last for 5-7 days, and maculopapular or scalatiniform rash will present the third or fourth day of fever. It is highly infectious one day before and 5 days after the fever started. There is still no vaccine or special drug available for prevention and treatment. Though the symptoms and signs of the disease quite severe, patient will recover within a week by only supportive treatment. Mortality rate is quite low unless complications or hemorrhagic dengue fever are present. Dengue virus have four immunological types (1, 2, 3, 4). Homologous immunity is of long duration, but heterologous immunity, though present, is brief and may permit mild or undiagnosed febrile disease¹. It may cause adverse immunological reaction (hemorrhagic shock syndrome) due to antibody-antigen complexes, or even worse, it will end up to hemorrhagic dengue fever due to immune enhancement².

Dengue virus are endemic in most of the countries of the tropical Asia (India, Burma, Thailand, Laos, Cambodia, Singapore, Vietnam, Malaysia, Indonesia, New Guinea, Bangladesh, Sri Lanka and the Philippines), Northern part of Australia and West Africa. Outbreaks of dengue fever in Penghu Islands (1902)³, Tainan (1931)⁴, whole Taiwan Island (1942)⁵ and Liochyou Island (1981)⁶ of the Taiwan Area were well documented. Southern part of Taiwan had gone through several outbreaks of dengue fever in the years of 1902, 1915, 1922, 1924, 1927 and 1931⁵. Fishermen, sailors, soldiers and foreign-trade merchants were thought to be the origin of infection. They were infected in other endemic areas and brought it back and spread widely in the southern part of Taiwan. Four groups of totally 71 fishermen were proved responsible for the origin of the outbreak in Liochyou Island of 1981⁷. They were infected while they were detained in Philippines for trespass and brought the disease back after they were released. Hence, no dengue fever was noticed in Taiwan until November 1987. According to the local practitioners, the original cases of suspected dengue fever were found in the middle September. Up to the date of December 9, a total number of 1,232 suspected cases were reported to Department of Health through the emergency surveillance system. Table 1 illustrated the cumulative number of suspected cases from 2 to 9 of December by administrative areas.

Dengue fever is always endemic in the tropical or subtropical areas within 40° latitudes where live the *Aedes*, especially *Aedes aegypti*. *Aedes* can survive as long as 4 months in the laboratory fly around at a range of 50 meters and breed during the day time. They laid eggs in empty containers where they can endure drought for several months. It will take only 10-15 days for those eggs to hatch and become *Aedes* when the environmental conditions are favorable.

An outbreak of dengue fever will take place due to the following critical conditions: 1) presence of dengue virus, 2) susceptible populations, 3) enough *Aedes* to be infected and spread the virus. It is impossible to control both the first and second conditions. The third one can be controlled by routine surveillance of the density of *Aedes* so as to warn and let the health authorities have enough time to implement control measures. For control of an existing outbreak, immediate massive operation to eliminate *Aedes* and their breeding sites are imperative. The experience of Thailand applying ultra-low-volume malathion aerially showed a satisfactory elimination of *Aedes* even inside the market places and houses^{8 9}. Malathion is an insecticide composed of organic phosphate and quite hazardous. Its hazards to human and environment could be limited to the minimum when used properly¹⁰.

The health authorities had already done their immediate control measures for this outbreak. unless all citizens support and cooperate in eradicating *Aedes* and their possible breeding sites inside or around their inhabitancy, termination of this outbreak will not be assured since the second generation of *Aedes* will soon be hatched and infectious in next spring. All medical personnel and general population are here reminded to consolidate the active surveillance system and eliminate the *Aedes* or its possible breeding sites. Complete eradication of dengue fever by implementation of the following prevention and control measures are recommended:

1. Active control of existing outbreak:
 - (a) Out door environmental fumigation or air spray insecticide (95% active Malathion 0.438 liter per hectare) during early morning or late afternoon. Spray less hazardous Pyrethroid in house or working place and destroy and possible breeding sites especially the water containers around the living or working compartments.
 - (b) Use insect repellent if you have to expose yourself to mosquito bites.
 - (c) For prevention as a reservoir, patient should avoid possible bites by mosquitoes and stay inside a well protected house at least 5 days after onset of symptoms and signs.
 - (d) Clinical physicians should report all suspected cases to their local health authorities.
2. Control on patients, potential patents and surrounding area:
 - (a) All medical personnel should report all patients or potential patients to local health authorities even though dengue fever is not a notifiable or reportable disease in Taiwan Area.
 - (b) Put patient under protective isolation from further bites by mosquitoes at least 5 days.
 - (c) Keep track of potential cases who had stayed or worked in the same place where a suspected or confirmed patient had been two weeks before the onset of illness.
- 3 Preventive Measures:
 - (a) Active surveillance of the density of *Aedes* in high risk areas. Routine or selective disinfection of high risk areas to eradicate or keep the density of *Aedes* within a safe level.
 - (b) Enforce health education through mass media or any possible channel.