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Detection of Dengue Virus-Infected Patients among Passengers at the Quarantine Station of the New Tokyo International Airport

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Japan experienced dengue outbreaks in Nagasaki, Hiroshima, Kobe, and Osaka Cities between 1942 and 1945 (1), but not thereafter. Imported dengue cases have been frequent in Japan (2-4), however. Given that all present dengue cases are imported, we attempted to detect dengue cases at the quarantine station of the New Tokyo International Airport, Narita, Chiba Prefecture, from 2000 to 2002. We collected blood specimens from 233 passengers who declared health problems and had been diagnosed by doctors with suspected dengue infection. Thirty-one (13%) of them were confirmed by laboratory diagnosis to have dengue virus infections (see below).

Laboratory diagnosis was performed at the quarantine station and repeated at the Department of Virology 1, National Institute of Infectious Diseases, Tokyo, for confirmation. The laboratory diagnosis consisted of reverse transcriptase-polymerase chain reaction (RT-PCR), IgM-capture enzyme-linked immunosorbent assay (ELISA) (FOCUS technologies, Cypress, Calif., USA), IgG-ELISA (FOCUS technologies), rapid immunochromatographic test (PanBio, Brisbane, Australia), and hemagglutination inhibition (HI) (5-7). The primer sequences used for RT-PCR were previously reported (6,7).

One (4%) in 26 suspected cases in 2000, 8 (12%) in 69 suspected cases in 2001, and 22 (16%) in 138 suspected cases were confirmed as true dengue infections (Table 1). The number of infected passengers was high in August and September (Table 2). Thirty of 31 cases were Japanese and the thirty-first was Laotian. Most infected passengers had traveled in Southeast Asia or South Asia. One had been to Africa, one to Central America, one to Central and South America, and one to South America (Table 3).

Dengue virus infections are a serious cause of morbidity and mortality in most of the tropical and subtropical countries (8,9). It is estimated that up to 100 million cases of dengue fever (DF) and 250,000 cases of dengue hemorrhagic fever (DHF) occur annually (10), and the epidemic appears to be expanding. Nearly 5 million Japanese visit tropical and subtropical areas annually, and 2 million people visit Japan from these areas. Our data suggest a need for closer surveillance of DF and DHF in Japan, particularly at quarantine stations.

Table 1 Number of passengers who were confirmed to be infected with dengue viruses

Year	Number of passengers	
	Examined	Dengue virus-infected (%)
2000	26	1 (4)
2001	69	8 (12)
2002	138	22 (16)
Total	233	31 (13)

Table 2 Number of passengers confirmed to be infected with dengue viruses in each month during 2000-2002

Month	Number of confirmed cases
January	1
February	2
March	3
April	2
May	1
June	0
July	3
August	8
September	6
October	2
November	2
December	1
Total	31

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Table 3. The countries visited by passengers infected with dengue

Year	Case no.	Age, Sex			Visited countries		
2000							
	N00-23	31, M	Cambodia				
2001							
	N01-09	29, M	Thailand	Malaysia	Thailand		
	N01-10	39, M	El Salvador				
	N01-26	31, M	Indonesia				
	N01-38	22, F	Philippines				
	N01-41	24, F	Indonesia	Malaysia	Thailand	Cambodia	Viet Nam
	N01-42	24, F	Malaysia	Thailand	Cambodia	Viet Nam	
	N01-47	54, M	Thailand	Cambodia	Thailand		
	N01-66	30, F	Indonesia				
2002							
	N02-01	32, F	Nepal	India	Thailand		
	N02-03	25, M	Guinea	Mali	Burkina Faso	Mali	
	N02-07	20, F	Indonesia				
	N02-12	37, M	Brazil				
	N02-19	20, M	Venezuela	Brazil	French Guiana	Surinam	Trinidad and Tobago
	N02-23	28, M	Thailand				
	N02-39	26, F	Thailand				
	N02-40	49, M	Thailand				
	N02-44	33, F	Myanmar				
	N02-49	18, F	Philippines				
	N02-58	33, M	Philippines				
	N02-59*	8, F	Thailand				
	N02-62	22, M	Thailand				
	N02-65	9, M	Malaysia				
	N02-80	22, M	Thailand				
	N02-81	21, M	Singapore	Indonesia			
	N02-86	23, M	Thailand				
	N02-91	19, F	China	Nepal	India		
	N02-93	28, F	India				
	N02-127	26, M	Sri Lanka				
	N02-128	25, M	Thailand	Cambodia	Viet Nam		
	N02-135	32, F	Nepal	India	Nepal	Thailand	

* Laotian

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