

Dengue type 3 virus infections in European travellers returning from the Comoros and Zanzibar, February-April 2010

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In late February-early April 2010, five cases of dengue fever were diagnosed in returning travellers in Europe in EurotravNet sites in Sweden and France in patients with travel history to the Comoros and/or Zanzibar, Tanzania. Four cases were non-complicated dengue fever and one case dengue hemorrhagic fever. Three patients were viraemic at the time of diagnosis and infected with Dengue type 3 virus.

An estimated 100 million cases of dengue fever and 250,000 cases of dengue haemorrhagic fever occur annually worldwide [1]. The past 20 years have seen a dramatic geographic expansion of epidemic dengue fever from Southeast Asia to the South Pacific Islands, the Caribbean, and the Americas. An increasing number of reports of dengue fever and associated illness among travellers to dengue virus-infected areas paralleled the changing epidemiology of dengue in local populations [1].

In 2010 (until 14 April), five cases of dengue fever including one case of dengue haemorrhagic fever, have been reported from EurotravNet sites in France and Sweden, in four travellers returning from the Comoros and one traveller returning from Zanzibar, Tanzania. EurotravNet, the Network for travel medicine and tropical diseases of the European Centre for Disease Control consists of 14 core sites in nine European countries and participants monitor travel related infectious diseases in Europe (www.eurotravnet.eu).

Case reports

Cases were diagnosed in Paris (1 case) and Marseille (3 cases), France and Stockholm, Sweden (1 case). The age of cases ranged from 41 to 69 years, three were females, two males. All travellers to the Comoros had visited friends and relatives where they had stayed between 15 and 93 days in the period from December to March. The case returning from Zanzibar who had

travelled as a tourist, had stayed for two days in Stone Town and seven days in Nungwy. All cases were non-complicated dengue except for one case of dengue hemorrhagic fever. Detailed clinical presentations and onset of symptoms after return and laboratory findings are displayed in table 1.

Cases were confirmed by serology and four were positive for IgM and IgG and once case positive for IgM only. Three cases were confirmed as dengue type 3 virus (DENV-3) by PCR.

Discussion and conclusion

Six autochthonous cases of dengue fever were recently identified in the Comoros (March 2010). Additional cases were identified in individuals with travel history from the Comoros, in Madagascar (1 case), Mayotte (3 cases) and Reunion Island (1 case) [1,2]. In addition, two cases were potentially imported from Tanzania to Japan [2,3]. DENV-3 was identified in the cases in Madagascar and Japan. These results indicate that DENV-3 is currently circulating in the Comoros and Zanzibar, and given that the last outbreak in the Comoros took place in 1993 and involved DENV-1,[4] we may face a situation with the possibility for the emergence of a new outbreak including possible severe cases, similarly to what was recently observed in Sri-Lanka, East Africa and Latin America [5].

In order to protect themselves, travellers to areas where vector-borne diseases such as dengue fever and malaria are present should be advised to adopt some protective measures to avoid mosquito bites. Moreover, physicians should be prepared to diagnose and manage imported cases of dengue fever in travellers returning from the Comoros and East Africa early. Viraemic patients may spread the infection to regions where competent vectors are present, including the Mediterranean area and the south of Europe.

In metropolitan France, dengue fever is a mandatory notifiable disease since *Aedes albopictus* has become established in the Mediterranean French littoral in 2004 and in Corsica in 2006 [6].

A. albopictus were found in August 2009, in the centre of Marseille [7]. Given the intensity of population flows between the Comoros and Marseille, especially during summer, early detection of viraemic travellers and entomological surveillance are critical. The establishment of *A. albopictus*, the vector for dengue and chikungunya viruses, in the south of Europe and the presence of viraemic imported cases of dengue fever in these regions could lead to autochthonous transmission [8]. In 2007, a viraemic patient infected with chikungunya virus was the source of an outbreak of chikungunya in Emilia-Romagna, Italy, with 205 cases occurring between 4 July and 27 September 2007 [9]. So far no sustained outbreaks from imported dengue fever or chikungunya have occurred but vigilance is needed.

Our report confirms that returning travelers may serve as sentinels for local outbreaks of dengue fever in endemic areas [10]. Finally, the case presenting exclusively with fever and without additional symptoms commonly associated with dengue fever, illustrates that dengue fever should be included early in the differential diagnosis in febrile travellers particularly

when returning from areas with potential transmission of the disease [11].

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TABLE

Clinical characteristics dengue fever in travellers returning from the Comoros and Zanzibar (Tanzania), February-April 2010 (n=5)

	Case 1	Case 2	Case 3	Case 4	Case 5
Clinical symptoms	Fever, shivering, myalgias	Fever, arthralgias, myalgias, diarrhoea, headache, seizures, bleeding (haematemesis, ulorrhagia, metrorrhagia)	Fever	Fever, shivering, arthralgias, myalgias, headaches, diffused non-petechial rash	Fever, shivering, anorexia, cough, diarrhoea
Onset after return (in days)	7	4 (before return)	1	0	0
Leucocyte count/ μ L	5,280	2,300	3,200	4,900	7,500
Platelet count/ μ L	83,000	34,000	15,500	13,000	56,000
SGOT (U/L)	214 (norm 4.6)	257 (norm 6.5)	Not available	506 (norm 10.1)	214 (norm 4.6)
SGPT (U/L)	125 (norm 1.9)	183 (norm 4.5)	Not available	191 (norm 3.2)	101 (norm 1.5)
GGT (U/L)	54 (norm 1.5)	70 (norm 2.3)	Not available	278 (norm 4.6)	47 (norm 1.3)
LDH (U/L)	785 (norm 1.6)	1,221 (norm 3.2)	Not available	2,199 (norm 3.5)	765 (norm 1.6)
Serology	IgM + IgG ^a	IgM + IgG ^b	IgM + IgG ^c	IgM ^d	IgM + IgG ^a
PCR	Negative	DENV-3 ^e	Not available	DENV-3 ^e	DENV-3 ^e

DENV-3: Dengue virus type 3; GGT: Gamma-glutamyl transpeptidase; LDH: Lactate dehydrogenase; norm: normal upper value; SGOT: Serum glutamic oxaloacetic transaminase; SGPT: Serum glutamic pyruvic transaminase.

^a Detected by in house enzyme-linked immunosorbent assay (Associated National Reference Center for arboviruses IRBA-IMTSSA, Marseille).

^b Panbio ELISA IgM and IgG (rapid test dengue duo Ig M and Ig G Panbio negative); EIA Biotrin Ig M (1.7; N< 1.5) and Ig G (3.6; N< 1.5).

^c Dengue IgM specific for dengue virus was detected (54 PBU; ≥ 11 PBU positive) by ELISA (Dengue IgM PanBio) and high levels of dengue IgG was detected with IFI.

^d Detected by indirect immunofluorescence (IFI) test (Standard Diagnostics Dengue Duo) and confirmed by ELISA (Panbio Dengue DUO Test).

^e DENV-3 RNA was demonstrated in serum using 4 real time reverse-transcription-PCR (Taqman RT-PCR)-based assays [12].

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