RAPID RISK ASSESSMENT

Autochthonous cases of chikungunya fever on the Caribbean island, Saint Martin

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Main conclusions and recommendations

- This is the first documented autochthonous transmission of chikungunya virus in the Americas, on the Caribbean island Saint Martin.
- The cluster of cases has been detected during the ongoing dengue outbreak on the island.
- With the coming holiday season vigilance must be maintained regarding imported cases of chikungunya and dengue in the EU, including awareness among clinicians and travel clinics.
- Blood safety authorities need to be vigilant regarding the epidemiological situation on Saint Martin in line with measures taken for dengue.
- Exposure to infected mosquitoes is the principal risk for infection. Prevention of chikungunya is currently based on protection against mosquito bites and vector control; these are similar to the preventive measures to be taken against dengue.
- Onward transmission in the EU from imported cases during the winter season is not to be expected.

Source and date of request

ECDC Internal Decision, 6 December 2013.

Public health issue

Autochthonous transmission of chikungunya in the French part of the Caribbean island of Saint Martin.

Consulted experts

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Disease background information

Chikungunya is a mosquito-borne viral disease caused by an alphavirus from the *Togaviridae* family. It is transmitted by the bite of *Aedes* mosquitoes, primarily *Aedes aegypti* and *Aedes albopictus*, which are active during the day. The incubation period ranges from 1 to 12 days, with an average of 3 to 7 days. The typical clinical signs of the disease are fever and arthralgia, which may persist for weeks or months [1]. General complications include myocarditis, hepatitis, ocular and neurological disorders [2]. Some infected individuals are non-symptomatic or only mildly symptomatic, challenging the detection and diagnosis especially in tropical settings where dengue outbreaks are occurring simultaneously. In humans, the viral load in the blood can be very high at the beginning of the infection and lasts 5–6 days (up to 10 days) after onset of fever. A person who has recovered from chikungunya infection is likely to be immune against repeat infections [3]. Blood-borne transmission is possible [4, 5, 6]. Mother-to-child transmission has also been reported in women who developed the disease within the week prior to delivery [7, 8].

Chikungunya is endemic in parts of Africa, South-east Asia and on the Indian subcontinent. No autochthonous transmission of the virus has been detected in the Americas before. Globally, the most recent large outbreaks were reported in 2005–2006 from Réunion Island, Mauritius, Mayotte and various Indian states. The first autochthonous transmission within continental Europe was reported from Emilia Romagna, Italy in August 2007 [9] and in 2010 in Var, France [10].

Every year, imported cases among tourists are identified in several European countries. During the period 2008–2012, 475 imported chikungunya cases were reported in by EU/EEA countries. Most of the cases for which the country of infection is mentioned originated from Asia (one third from India, otherwise Thailand, Maldives, Sri Lanka, and Indonesia) and Africa (including islands in the Indian Ocean). In 2012, 55 cases of chikungunya fever were reported by 22 reporting EU and EEA countries. The country of infection was reported for 37 cases; mostly from India, the Philippines and Indonesia. In 2013, chikungunya fever outbreaks have been occurring in a variety of geographic locations within the Philippine archipelago, including Manila city, as well as Singapore, India (Gujarat, Tamil Nadu, Kerala, Odisha states), Micronesia (Yap), Indonesia (East Java, East Jakarta) Papua New Guinea and New Caledonia (sporadic cases in late April 2013).

Chikungunya virus is a single-strand, positive-sense RNA virus. The virus belongs to the Semliki forest complex, and is closely related to o'nyong'nyong, a virus circulating in Africa, and to a lesser extent to Mayaro virus. The latter is circulating in forests in the Caribbean (e.g. Trinidad) and South America in sylvatic mosquito vectors. Three different genotypes of chikungunya virus, Asian, West African and East/Central/South African (ECSA), have been identified. The acquisition of an A226V mutation in the envelope protein E1 of ECSA chikungunya virus, as observed in La Réunion in 2005, has increased the transmissibility of the virus through the widely distributed *Aedes albopictus* mosquitoes [11]. This mutated virus spread from the Indian Ocean to East Africa and Asia (e.g. India, Sri Lanka, Singapore, Malaysia and China) and caused the chikungunya outbreak in Italy. The chikungunya responsible for the two autochthonous cases in France belonged to the ECSA strain but without the mutation at position 226 [10].

In the EU, *Aedes albopictus* is established primarily around the Mediterranean [12] and has been confirmed as a competent vector of chikungunya virus [13].

Chikungunya virus can be identified using RT-PCR or viral isolation during the first week of illness. Serological diagnosis can be performed by detection of specific IgM antibodies in serum specimen from day 4–5 after the onset of symptoms, or a four-fold rise of specific chikungunya IgG antibody titre in a paired serum sample (acute and convalescent specimens). Specific IgM can persist for many months, in particular in patients with long-lasting arthralgia.

Event background information

Saint Martin is a small island in the Caribbean of approximately 88 km^2 with a population of around 71 000 inhabitants. It is divided into two parts between France and the Netherlands. The temperature averages between 26.6 and 29.4 degrees all year long with a low humidity. There is an intense rainy and hurricane season from July to November.

Two cases of autochthonous chikungunya were confirmed on 5 December 2013 in the French part of the island. The diagnosis relies on a positive RT-PCR performed by the French National Reference Centre for Arbovirus (Institut de Recherche Biomédicale des Armées, Marseille, France). Cases occurred during the outbreak of dengue that has been ongoing on the island since January 2013.

These two cases were detected through active case finding, implemented following the notification on 18 November 2013 of a cluster of five cases of arthralgia and fever, for which a diagnosis of dengue was excluded (negative NS1 and IgM). The onset of symptoms of the five notified cases occurred between 12 October and 15 November 2013. They all were residents of the Oyster Pond neighbourhood, located on the border with the Dutch part of the island.

As of 6 December, 12 suspected cases have been reported by active case finding: the two cases that were confirmed by RT-PCR, four probable cases based on a positive IgM/IgG chikungunya serology and six clinically suspected cases.

The definition for an autochthonous case used by the active case finding is as follows: a patient without a history of travel in the 15 days before onset of symptoms, with a rapid onset of fever >38.5°C and distal, incapacitating arthralgia.

ECDC threat assessment

The event suggests that autochthonous transmission of chikungunya is ongoing in the French part of the island. Given the size of the island, it cannot be excluded that a similar epidemiological situation might be ongoing in the Dutch part of the island.

Risk for continental EU

Saint Martin is a popular travel destination for EU residents and increased travel can be expected during the Christmas holidays. Therefore, travel-related cases of chikungunya, as well as of dengue, returning from the island Saint Martin can be expected. Viraemic asymptomatic returning travellers could contribute to transmission of the disease if giving blood.

The EU has the laboratory capacity to detect chikungunya, and imported cases would be detected through surveillance systems.

The invasive mosquito species *Aedes albopictus* is well established in many parts of the EU, primarily around the Mediterranean. It is a vector of chikungunya and highly capable of transmitting the ECSA chikungunya virus. As the chikungunya virus strain circulating in Saint Martin is not yet known, the capacity of *Aedes albopictus* present in the EU to transmit this strain may need to be re-assessed.

The risk of onward autochthonous transmission of chikungunya virus during the mosquito season can thus not be excluded given the fact that the competent vector is present and the environmental requirements are met [14], as was shown during the previous outbreaks in the EU. However, onward transmission from chikungunya cases imported from Saint Martin to the EU is not expected during the winter season because of the low activity of the vector.

Risk for EU overseas countries and outermost regions

An outbreak of dengue has been ongoing in the Caribbean region since the beginning of 2013, transmitted by *Aedes aegypti*. This mosquito species is also the primary vector for chikungunya and is widespread on all the islands in the Caribbean.

This is the first known outbreak of chikungunya virus with autochthonous transmission in the Americas and the majority of the population is presumably naïve to the infection. To date, the extent of the outbreak is difficult to assess and might have remained undetected in other locations of Saint Martin and on other islands.

The risk of spread of the disease from Saint Martin to other islands in the Caribbean region is high. The spread would most likely occur through travel of infected people, as the tourist season has just started, with high travel frequencies between the different islands. Therefore, awareness among clinicians is essential for early detection of cases.

As the disease is new to the Caribbean, the laboratory capacity to confirm suspected cases is limited and should be strengthened in the region. As per the preparedness plans for the introduction of chikungunya virus to the Americas, regional reference laboratories can provide support to confirm suspect cases. Selected national laboratories do have the capacity to perform adequate testing in the Caribbean.

Local authorities on Saint Martin Island are working together in close coordination with public health authorities in France and the Netherlands to implement actions in response to this outbreak. These activities include:

- epidemiological surveillance including syndromic surveillance and surveillance of severe cases;
- vector control activities have been implemented in the affected area and will rapidly be extended to the entire island, including around airports, schools, day nurseries, hospitals;
- communication and social mobilisation: information is being disseminated to health professionals, to the public (on individual protection, how to eliminate the larvae breeding ground) and to travellers by specific information in the airports.

Blood safety procedures are already in place regarding the ongoing outbreak of dengue on Saint Martin; it might be necessary to evaluate whether the chikungunya outbreak requires additional measures.

Conclusions and recommendations

This is the first documented autochthonous transmission of chikungunya virus in the Americas, on the Caribbean island of Saint Martin. The cluster of suspected cases was detected during the ongoing dengue outbreak on the island.

The following conclusions and recommendations are made:

- With the coming holiday season vigilance must be maintained towards imported cases of chikungunya and dengue in the EU.
- Clinicians and travel medicine clinics should be aware of the situation in Saint Martin and include chikungunya in their differential diagnosis.
- Blood safety authorities need to be vigilant regarding the epidemiological situation in Saint Martin and should consider deferral for donation in line with measures taken for dengue.
- Persons who are not immune to chikungunya may become infected with the virus. Exposure to infected mosquitoes is the principal risk for infection. Prevention of chikungunya is currently based on protection against mosquito bites and vector control and is similar to the preventive measures to be taken against dengue.
- A preparedness and response plan for the introduction of the chikungunya virus to the Americas is available from the WHO Pan-American Health Organization and the US Centers for Disease Control and Prevention [15];
- WHO does not advise special screening at points of entry with regard to this event nor does it currently recommend the application of any travel or trade restrictions [16].
- Onward transmission in the EU from imported cases during the winter season is not to be expected, but vigilance during the mosquito season is required, as the possibility of autochthonous transmission of tropical mosquito-transmitted viruses in continental Europe does exist.

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