**Short Communication**

**Chikungunya Fever in Japan Imported from the Caribbean Islands**

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**SUMMARY:** A 53-year-old Japanese woman who was working as a volunteer in the Commonwealth of Dominica in the Caribbean islands presented with a high-grade fever and severe incapacitating generalized arthralgia. The Asian genotype of the chikungunya virus was confirmed using reverse transcription-PCR and serology, based on the presence of a specific neutralization titer and immunoglobulin M antibodies. She was diagnosed with post-chikungunya chronic arthritis based on persistence of her polyarthritis for 3 months and the presence of rheumatoid factor, immunoglobulin G-rheumatoid factor, and matrix metalloproteinase-3. Chikungunya virus should be considered as a causative pathogen in travelers returning from Caribbean islands. Clinicians should consider chikungunya fever in the differential diagnosis of patients who complain of chronic arthritis and have a history of travel to an endemic area.

Chikungunya fever (CHIKF) is a re-emerging infectious disease. The first isolation of the Chikungunya virus (CHIKV) in the Western Hemisphere, in the French West Indies, was reported in December 2013 (1). Since then, CHIKV has been found in other Caribbean islands and has spread to North and South America with just over 1,280,000 suspected cases in the region up until October 2014 (2). The Centers for Disease Control and Prevention and the European Centre for Disease Prevention and Control (ECDC) have reported numerous imported cases of CHIKF from the Caribbean islands to the United States and European countries, respectively (3,4). As globalization continues, CHIKV from the Caribbean islands has also become a threat to Asian countries.

A previously healthy 53-year-old Japanese woman who was working as a volunteer in the Commonwealth of Dominica in the Caribbean islands from early to mid-June 2014 suddenly developed a high-grade fever and severe incapacitating generalized arthralgia. She immediately returned to Japan. On arrival, she was tested at the Narita Airport Quarantine Station for malaria and dengue fever using rapid diagnostic tests, such as that targeting the dengue virus (DENV) NS1 antigen. Both tests yielded negative results. The patient was convalescing from her symptoms at home. CHIKV RNA by reverse transcription-PCR of her serum that had been extracted on the day she returned home (day 5 after returning to Japan) was detected at the quarantine station (5). With this confirmation of CHIKF, she was admitted to our hospital the same day following the instructions of the quarantine station. The sequence of the E1 surface glycoprotein gene of CHIKV derived from the patient’s peripheral blood was classified as an Asian genotype, which shares conserved sequences with endemic virus strains in the Caribbean islands.

Physical examination revealed fever and arthritis with swelling in the ankles, knees, elbows, wrists, and finger joints. From day 4 after her return to Japan, a generalized spotted rash developed over her entire body except her face (Fig. 1). Blood tests revealed the presence of leukopenia but no remarkable thrombocytopenia. Laboratory examinations revealed a white blood cell count of $3.5 \times 10^3/\mu L$, hemoglobin level of 13.6 g/dL, platelet count of $17.1 \times 10^4/\mu L$, lactate dehydrogenase level of 254 IU/L, and C-reactive protein level of 0.3 mg/dL. Virological examinations demonstrated the
Aedes albopictus has played an important role in CHIKV transmission in recent outbreaks, indicating that imported CHIKV can be transmitted by *Ae. albopictus*, which is indigenous in Japan (except in Hokkaido and Aomori Prefecture) (11). The potential risk for local vectorial transmission of CHIKV is a real one, particularly considering the recent local outbreak of DENV in Japan (August to October, 2014) (12), which demonstrates the transmission capacity of indigenous mosquitoes in causing infections among residents who did not travel to DENV-endemic countries.

Although CHIKV infection was previously described as a self-limiting infectious disease, severe arthralgia persists in more than 60% of patients (13). Chronic rheumatoid-like polyarthritis known as PCCA that sometimes leads to destructive arthropathy occurs in around 5.6% of patients after acute CHIKV infection (14). PCCA was previously reported after an East/Central/South African (ECSA) genotype infection, but a case of PCCA caused by the Asian genotype, as well as our case, was also reported in Saint Martin in the Caribbean islands in 2013 (15). Therefore, it is important to consider that the epidemic Asian genotypes could be a causative pathogen for PCCA. Based on the observation of the outbreak of the ECSA genotype in La Reunion Islands in 2005 to 2006, RF and anti-CCP antibodies could be detected in 12.5–57.1% and 28.6–56.5% of patients with PCCA, respectively (14,16,17). In our case, not only RF but also IgG-RF could be detected in the early chronic phase, within 2 weeks of the onset of clinical symptoms. Additionally, we confirmed the elevation of MMP-3, which is a specific marker related to the activity of RA. We should consider CHIKF when a patient with a history of travel to CHIKV-endemic areas, including the Caribbean islands, complains of generalized arthralgia accompanied by elevation of these markers.

As the number of international travelers increases with globalization, imported CHIKV cases could increase in non-endemic countries. Moreover, the emerging cases of DENV in Japan indicate the need for all possible preventive measures against CHIKV spreading domestically. Travelers who visit endemic regions should be alerted to the risk of CHIKF and advised to protect themselves against mosquito bites. In addition, early detection of imported cases is critical to prevent local transmission in non-endemic countries.
detection and management of infected patients would obviously reduce the risk of local transmission caused by imported CHIKV. Not only the ECSA genotype but also the Asian genotype causes PCCA associated with autoantibodies in RA. CHIKV infection should be considered in patients who have rheumatoid-like symptoms returning from CHIKV-endemic countries including those in the Western Hemisphere.

Acknowledgments We thank Dr. Tomohiko Takasaki of National Institute of Infectious Diseases for technical support and helpful advice in this study.

Conflict of interest None to declare.

REFERENCES