Iranian Journal of Virology 2016;10(1): 31-34

Case Report

An Imported Case of Dengue Fever in Iran, 2015

Baniasadi V[1], Salehi-Vaziri M[1], Jalali T[2,1], Azad-Manjiri S[1], Mohammadi T[1], Khakifirouz S[1], Fazlalipour M[1*]

1. Department of Arboviruses and Viral Hemorrhagic Fevers (National Ref Lab), Pasteur Institute of Iran, Tehran, Iran
2. Shahed University, Department of Biology, Tehran, Iran

Abstract

Background: Dengue fever is a mosquito-borne disease which is not known to be endemic in Iran.

Case Report: In October 2015, a 32-year-old Iranian woman was admitted with acute unexplained high-grade fever, headache, pain, rash, diarrhea, leukopenia and elevated liver enzymes after returning from India. Serological and molecular analysis for Dengue virus (DENV) infection revealed positive IgM, negative IgG and positive reverse transcriptase-PCR (RT-PCR)

Results: PCR product was sequenced and the phylogenetic analysis showed a DENV 2, genotype 4 strain with high similarity to other isolates reported from India.

Conclusion: Considering that DENV is one of the most common infections among travelers, an integrated surveillance system is strictly recommended in dengue non endemic countries.

Keywords: Dengue virus, Imported Infections, India, Iran.

Introduction

Dengue virus (DENV) is a positive-stranded RNA virus which is classified in Flaviviridae family and has four serotypes DENV-1, DENV-2, DENV -3 and DENV-4 (1). The Aedes aegypti and Aedes albopictus mosquitoes are vectors of DENV and the virus is transmitted to humans via infected female mosquito bites. The disease is endemic in the tropics and the subtropics within Caribbean Basin, Central and South America, the Pacific Islands, Asia and Africa (2).

About 2.5 billion people live in dengue-endemic areas and every year, 390 million new cases reported in the world (3). International tourists traveling to endemic countries are one of the groups who are at risk of DENV infection (4). India is one of the endemic countries for DENV and during the last 50 years, dengue in India has been described (5).

Iran is the second-largest nation in the Middle East and the 18th-largest in the world with approximately 80 million populations. Each year, thousands of Iranian people travel to India as tourists, business managers and students. In the current report, we describe a DENV positive Iranian woman after returning from India.

***Corresponding author:** Mehdi Fazlalipour, Department of Arboviruses and Viral Hemorrhagic Fevers (National Ref Lab), Pasteur Institute of Iran, Tehran, Iran /Address: Pasteur Institute of Iran, 69 Pasteur Ave., Tehran, Iran/ Postcode: 1316943551/ Tel/Fax: +98- 21- 64112821/
Email: MfP.virology@gmail.com
M_fazlalipour@pasteur.ac.ir

Case Report

A serum sample from a 32-year-old woman with a history of recent travelling to India was referred to the department of Arboviruses and viral hemorrhagic fevers (National Reference Laboratory), Pasteur Institute of Iran in

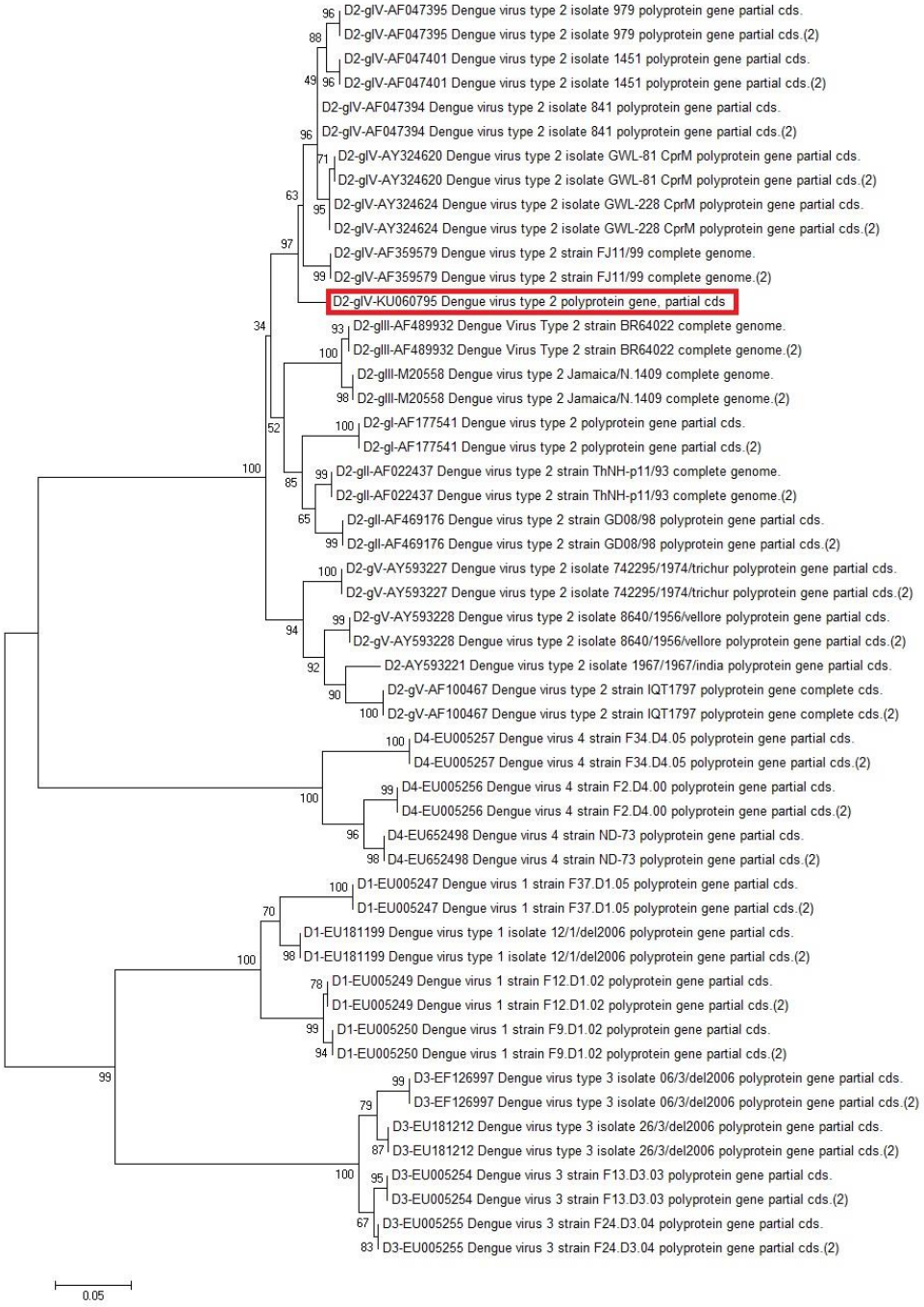

Fig. 1. Maximum-Likelihood phylogenetic tree (Bootstrap 10,000) using Kimura 2-parameter substitution model.

Tehran. The patient was admitted with fever, headache, myalgia, and diarrhea. After hospitalization, she manifested skin rashes and laboratory analyzed showed leukopenia (WBC=2500/mm3), mild increase in AST (63 IU/L) and ALT (82 IU/L). Other laboratory parameters were normal (Table 1).

The sample was tested for DENV infection using serological and molecular assays. Anti-Dengue virus IgM and IgG was performed using ELISA (Dengue Virus IgM/IgG Capture DxSelect™, Focus Diagnostics, USA). The ELISA test revealed positive IgM and negative IgG antibodies results.

For viral genome detection, viral RNA was extracted by QIAamp® Viral RNA Mini Kit (QIAGEN GmbH, Hilden, Germany) based on manufacturer's instruction. Reverse transcriptase-PCR (RT-PCR) was carried out by QIAGEN One-Step RT-PCR kit (QIAGEN

Table 1: Laboratory findings of the DENV positive case.

Parameters	Results
WBC (×103 /µl)	2.5
RBC (×106 /µl)	4.35
Platelets (×103 /µl)	176
Hb (g/dL)	13.1
Total Bilirubin (mg/dL)	0.2
Direct Bilirubin (mg/dL)	0.1
ALP (U/L)	194
AST (U/L)	63
ALT(U/L)	82

GmbH, Hilden, Germany) according to manufacturer's protocol. RT-PCR mix consisted of 10 µl 5x QIAGEN One-Step RT-PCR Buffer, 2 µl dNTP Mix (containing 10 mM of each dNTP), 0.6 µM of each primer (Forward: 5'-TCAATATGCTAAAACGCGCGAGAAACCG-3', Reverse: 5'-TTGCACCAACAGTCAATGTCTTCAGGTTC-3'), 2 µl QIAGEN OneStep RT-PCR Enzyme Mix, 500 ng of extracted RNA in a 50 µl total reaction volume (6). The RT-PCR was strongly positive for DENV.

To perform phylogenetic analysis, the PCR product was sequenced by Macrogen Company (Macrogen Inc., Seoul. Republic of Korea). The raw sequencing data was trimmed using CLC Main Workbench 5.0 software package (CLC Bio, Aarhus, Denmark) and then verified by BLAST (http://blast.ncbi.nlm.nih.gov/Blast.cgi).

Phylogenetic analysis was performed by the use of MEGA V6.02 as previously described (7) and the isolate clustered in DENV 2, genotype 4 with a high similarity to other strains reported from India (Figure 1).

The sequence of the isolate was submitted to GenBank with the accession number of KU060795.

Discussion

DENV is the most common arboviruses causing more than 390 million dengue infections per year across over 100 countries (3). The risk of DENV infection has been increased because of poor vector control, climate change and urbanization. Traveling to endemic countries also poses the risk of DENV infection and a multinational study indicated dengue as the second most prevalent etiological agents of febrile disease among travelers (8).

India is a dengue-endemic region where account about 34% of global dengue infections (approximately 33 million cases) (5).Every year thousands of Iranian tourists travel to India and other dengue-endemic countries and are at risk of DENV infection. To reduce the possibility of infection, travellers should be informed about the risk of being infected with DENV and the preventive measures avoiding mosquito bites. On the other hand a sensitive surveillance system to identify and confirm suspected travellers in the shortest possible time is very important; in this regard clinicians should have knowledge of dengue symptoms, clinical management and its potential complications (9). The outcome of infection with DENV varies from asymptomatic to dengue fever, dengue hemorrhagic fever (DHF), and dengue shock syndrome (DSS). Given the variability in clinical disease, all suspected cases with the history of travelling to endemic areas should be confirmed by laboratory tests and reliable laboratory tests should be employed for this purpose. Considering the possible cross-reaction between DENV and other falaviruses in IgM/IgG ELISA tests the positive results should be confirmed with neutralization assays and detection of viral RNA with RT-PCR which is more specific should be included in diagnostic strategies as well.

References

1. Diamond MS, Pierson TC. Molecular Insight into Dengue Virus Pathogenesis and Its

Implications for Disease Control. Cell. 2015;162(3):488-92.
2. Daep CA, Munoz-Jordan JL, Eugenin EA. Flaviviruses, an expanding threat in public health: focus on dengue, West Nile, and Japanese encephalitis virus. J Neurovirol. 2014;20(6):539-60.
3. Bhatt S, Gething PW, Brady OJ, Messina JP, Farlow AW, Moyes CL, et al. The global distribution and burden of dengue. Nature. 2013;496(7446):504-7.
4. Jelinek T. Dengue fever in international travelers. Clin Infect Dis. 2000;31(1):144-7.
5. Vikram K, Nagpal BN, Pande V, Srivastava A, Saxena R, Anvikar A, et al. An epidemiological study of dengue in Delhi, India. Acta tropica. 2016;153:21-7.
6. Saxena P, Dash PK, Santhosh SR, Shrivastava A, Parida M, Rao PL. Development and evaluation of one step single tube multiplex RT-PCR for rapid detection and typing of dengue viruses. Virol J. 2008;5:20.
7. Salehi-Vaziri M, Baniasadi V, Jalali T, Mirghiasi SM, Azad-Manjiri S, Zarandi R, et al. The First Fatal Case of Crimean-Congo Hemorrhagic Fever Caused by the AP92-Like Strain of the Crimean-Congo Hemorrhagic Fever Virus. Japanese journal of infectious diseases. 2016;69(4):344-6.
8. Wilson ME, Weld LH, Boggild A, Keystone JS, Kain KC, von Sonnenburg F, et al. Fever in returned travelers: results from the GeoSentinel Surveillance Network. Clin Infect Dis. 2007;44(12):1560-8.
9. Duber HC, Kelly SM. Febrile illness in a young traveler: dengue fever and its complications. The Journal of emergency medicine. 2013;45(4):526-9.