Laboratory Detection Facility of Dengue Fever (DF) in Iran: The First Imported Case.

S Chinikar, S Ghiasi, M Moradi, S Madihi

Citation

S Chinikar, S Ghiasi, M Moradi, S Madihi. *Laboratory Detection Facility of Dengue Fever (DF) in Iran: The First Imported Case.*. The Internet Journal of Infectious Diseases. 2009 Volume 8 Number 1.

Abstract

In 11/07/2008, with recommendation of a physician, a patient' serum sample was sent to laboratory of Arboviruses and Viral Hemorrhagic Fevers Laboratory (National Reference Laboratory), Pasteur Institute of Iran for Dengue Fever diagnosis. He was a 61 years old man with travel background to Malaysia (Kuala Lumpur) in 26 June 2008 with a history of going to forest in this journey. Serological (ELISA) and molecular tests (RT-PCR) have been used for the diagnosis. The serological assay result showed IgM positive in the first and second serum samples, but the IgG in the second one has been started to raise .Also, the molecular results demonstrated the presence of virus genome in the first sample. It is the first documented report of imported DF in Iran.

INTRODUCTION

Dengue (DEN) virus belongs to the genus Flaviviruses, and consists of four serotypes (DEN-1, 2, 3, 4).These serotypes have cross reactivity in immunological tests and interestingly no cross immunity (1, 2). Dengue virus infections may be asymptomatic or may lead to undifferentiated fever, dengue fever (DF) or dengue hemorrhagic fever (DHF) that may lead to dengue shock syndrome (DSS) (2).

Currently, the incidence proportion of the disease has been estimated to 50–100 million cases, 25,000 deaths and 450,000 cases of DHF/DSS that reported over the world. The incidence of epidemic and endemic dengue has increased substantially. The increased epidemic activity, which is caused by all four virus serotypes, is associated with the geographic expansion of both the mosquito vectors and the viruses (3).

The dengue viruses are transmitted to humans by the bite of infected female mosquitoes of the Aedes species. (e.g. Ae. aegypti, Ae. albopictus, Ae. polynesienses). The incubation period in humans ranges from 3 to12 days, and is most commonly 5 to 7 days (1, 2).

Serological (ELISA) and molecular tests (RT-PCR) have been used for the diagnosis of dengue infection.(4) The control of DF involves combating the vector, implementing surveillance systems, and developing effective vaccines (2).

CASE DEFINITION

In 11/07/2008, with recommendation of a physician, a patient' serum sample was sent to laboratory of Arboviruses and Viral Hemorrhagic Fevers Laboratory (National Reference Laboratory), Pasteur Institute of Iran for Dengue Fever diagnosis. He was a 61 years old man with travel background to Malaysia (Kuala Lumpur) in 26 June 2008 with a history of going to forest in this journey. A few days after returning to Iran, he was suffered by a fever (38.5º C) and visited by mentioned physician. He administrated by Gentamycin 80 mg (IM) three days but this treatment was not effective and consulted by his physician again. Then the physician changed the treatment protocol (serum therapy, Dexamethazon (IV), CEFTRAX (IV), Ciprofloxacin) but his fever continued to a week and then stopped. In addition, the other clinical manifestations were fatigue and rash on hands. Gums' bleeding has been appeared after next few days. The serum samples were sent to the Lab with one week period. The sera were checked by ELISA for anti-DF virus IgM & IgG antibodies through two different commercial diagnostic kits (IBL Co & Vircell Co) and our domesticated protocol by Native Antigen (5). Moreover, viral RNA was extracted from the sera by QIAamp Viral RNA Kit (Qiagen). The samples were analyzed subsequently by RT-PCR through one step RT-PCR kit (QIAgen) using specific primers which could detect all subtypes of DEN (6). Besides, his blood samples had been analyzed for Hematology and Biochemistry analysis.

RESULT AND DISCUSSION

The serological assay result showed IgM positive in both samples, but the IgG in the second one has been started to raise .Also, the molecular results demonstrated the presence of virus genome in the first sample. Results of general blood test such as CBC and chemical parameters had not changed significantly but SGPT enzyme has been given raised.

It is the first documented report of imported DF in Iran (Although according to the national surveillance, we are working on the all received sera and also retrospectively in our lab bank sera for DF detection). Many Iranians, travel to countries especially south East Asia and Saudi Arabia. In this way , Saudi Arabia is more critical because DF is endemic in this region and should not be forgotten that hundreds of Iranian people do pilgrims annually and so it may increase the probability of DF infection in that moment (7). Recent studies demonstrated that DF was the second most common cause of fever in returning travelers. Therefore, travelers might introduce more virulent virus subtypes into areas where only mild disease has been observed before (3). Some Aedes species have been reported from Iran (8) but Aedes responsible for dengue virus transmission has not been reported in Iran yet , on the other hands, in Pakistan these species has been reported.

References

1. Ligon BL. Dengue fever and dengue hemorrhagic fever: a review of the history, transmission, treatment, and prevention. Semin Pediatr Infect Dis. 2005 Jan;16(1):60-5.
2. Fields BN, Knipe DM, Howley PM. Fields virology. 5th ed. Philadelphia ; London: Wolters Kluwer Health / Lippincott Williams & Wilkins; 2007.
3. Wichmann O, Jelinek T. Dengue in travelers: a review. J Travel Med. 2004 May-Jun;11(3):161-70.
4. De Paula SO, Fonseca BA. Dengue: a review of the laboratory tests a clinician must know to achieve a correct diagnosis. Braz J Infect Dis. 2004 Dec;8(6):390-8.
5. Yamada K, Nawa M, Takasaki T, Yabe S, Kurane I. Laboratory diagnosis of dengue virus infection by reverse transcriptase polymerase chain reaction (RT-PCR) and IgM-capture enzyme-linked immunosorbent assay (ELISA). Jpn J Infect Dis. 1999 Aug;52(4):150-5.
6. Grobusch MP, Niedrig M, Gobels K, Klipstein-Grobusch K, Teichmann D. Evaluation of the use of RT-PCR for the early diagnosis of dengue fever. Clin Microbiol Infect. 2006 Apr;12(4):395-7.
7. Fakeeh M, Zaki AM. Virologic and serologic surveillance for dengue fever in Jeddah, Saudi Arabia, 1994-1999. Am J Trop Med Hyg. 2001 Dec;65(6):764-7.
8. Zaim M. Mosquito fauna of Iran. XVII Inter Cong Entomol, Hamburg, FG Germany. 1984.

Author Information

Sadegh Chinikar
Arboviruses and Viral Hemorrhagic Fevers Laboratory (National Reference Laboratory), Pasteur Institute of Iran

Seyed Mojtaba Ghiasi
Arboviruses and Viral Hemorrhagic Fevers Laboratory (National Reference Laboratory), Pasteur Institute of Iran

Maryam Moradi
Arboviruses and Viral Hemorrhagic Fevers Laboratory (National Reference Laboratory), Pasteur Institute of Iran

Saeed Reza Madihi
Ghadir Clinic, Tehran, Iran