

Letter To Editor

Solving the Mystery of Dengue in Iran; Are We Close to an Answer?

Salehi-Vaziri M¹, Fazlalipour M¹, Baniasadi V^{1*}

Department of Arboviruses and Viral Hemorrhagic Fevers (National Ref Lab), Pasteur Institute of Iran, Tehran, Iran

Dear Editor:

Today around half of the world's population live in areas where there is a risk of dengue virus (DENV) infection. It is known that at least 100 countries in Asia, the Pacific, the Americas, Africa, and the Caribbean are endemic for DENV. It is estimated that approximately 400 million infections occur annually, including 2 million severe dengue disease cases and 21,000 deaths. However, no approved antiviral therapies or vaccines are available against DENV (1). There are 4 different serotypes DENV (DENV1-4), all classified within the family Flaviviridae, genus Flavivirus. Although the serotypes have cross reactivity in serological tests they do not produce cross immunity. The main route of virus transmission to humans is the bite of infected Aedes mosquitoes, however, there are other non-vector-borne modes of transmission, which include mothers to fetus transmission, transfusion-related transmission and laboratory mishandle of blood specimen. The incubation period is 5 to 7 days on average but could range from 3 to 12 days. The DENV infection is usually asymptomatic or causes mild dengue fever (DF); nevertheless, it may lead to a life threatening dengue hemorrhagic fever (DHF)

or dengue shock syndrome (DSS) which could be fatal (2).

First case of dengue fever was reported in Iran in July 2008 (3). A serum sample from a febrile patient returning from Malaysia was sent to laboratory of Arboviruses and viral hemorrhagic fevers, Pasteur institute of Iran and DENV infection was confirmed by molecular and serological tests. Considering the close proximity of Iran to dengue-endemic countries including Saudi Arabia and Pakistan, a retrospective study (4) was performed to evaluate the possibility of dengue virus infection in the country. In this study a total of 300 human sera from patients suspected to Crimean-Congo Hemorrhagic Fever (CCHF) which were negative for CCHF virus infection, were analyzed. In this study 15 samples were serologically positive in which 3 were both serologically and molecularly positive; among the positive cases 8 had history of travelling to dengue endemic countries and rest of them mostly resided in southeast province of Sistan & Baluchistan and did not have history of traveling to endemic countries (4). Another investigation studying 540 blood samples from blood donors of Sistan & Baluchistan province showed 41 dengue serologically positive cases (5). This two studies could indicate that DENV is endemic in southeast of Iran (next to Pakistan), however it should be mentioned that DENV positive cases with no history of travelling to known overseas endemic areas for DENV, were only serologically positive. Regarding the extensive cross reaction between flaviviruses and the possible false positive results of ELISA test, these findings should be interpreted cautiously.

*Corresponding author: Vahid Baniasadi, 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: baniasadi.vahid@gmail.com, baniasadi@pasteur.ac.ir

To detect the vectors of DENV in Iran, an active entomological surveillance of *Aedes aegypti* and *Ae. albopictus* was started after the documentation of the first case of dengue in Iran. The first published results of the surveillance indicated the occurrence of *Ae. albopictus* larvae and *Ae. Albopictus* adult mosquitoes in Sistan & Baluchistan province in 2009 and 2013, respectively (6). Although same result was not observed from 2103 onward, the detection of *Ae. albopictus* in southeast Iran suggests the possible establishment of this species in this region.

To determine the actual situation of dengue in Iran, the entomological surveillance should be expended through southeast Iran and the DENV infection should be specify in isolated dengue vectors. Given that Iran shares 800 km border with Pakistan where 14 dengue outbreaks have been documented up to date as well as every year an estimated of 1,500,000 Iranian pilgrims travel to Saudi Arabia, another dengue endemic country, Iran could be at serious threat of dengue. Therefore beside continuous entomological surveillance, appropriate vector control strategies and surveillance of imported Dengue should be considered as priorities.

Dr Salehi-Vaziri is director, Department of Arboviruses and Viral Hemorrhagic Fevers laboratory (National Ref Lab), Pasteur Institute of Iran. His research interests are the detection, prevention and control of Arboviral diseases and Viral Hemorrhagic fevers including Crimean-Congo Hemorrhagic Fever (CCHF), Denuge Fever, Rift Valley Fever, Hanta virus and West Nile Fever from all over the country.

As the director of National Reference Laboratory, his aim is a perfect surveillance for improving health system to control global infectious diseases.

References

1. Gubler DJ. The economic burden of dengue. *The American journal of tropical medicine and hygiene*. 2012 May;86(5):743-4. PubMed PMID: 22556068. Pubmed Central PMCID: 3335674.
2. Guzman MG, Gubler DJ, Izquierdo A, Martinez E, Halstead SB. Dengue infection. *Nature reviews Disease primers*. 2016 Aug 18;2:16055. PubMed PMID: 27534439.
3. Chinikar S, Ghiasi SM, Moradi A, Madihi SR. Laboratory Detection Facility of Dengue Fever (DF) in Iran: The First Imported Case. *the internet journal of infection diseases*. 2010;8(1):1-2.
4. Chinikar S, Ghiasi SM, Shah-Hosseini N, Mostafavi E, Moradi M, Khakifirouz S, et al. Preliminary study of dengue virus infection in Iran. *Travel medicine and infectious disease*. 2013 May-Jun;11(3):166-9. PubMed PMID: 23194952.
5. Aghaie A, Aaskov J, Chinikar S, Niedrig M, Banazadeh S, Mohammadpour HK. Frequency of dengue virus infection in blood donors in Sistan and Baluchestan province in Iran. *Transfusion and apheresis science : official journal of the World Apheresis Association : official journal of the European Society for Haemapheresis*. 2014 Feb;50(1):59-62. PubMed PMID: 24332363.
6. Doosti S, Yaghoobi-Ershadi MR, Schaffner F, Moosa-Kazemi SH, Akbarzadeh K, Gooya MM, et al. Mosquito Surveillance and the First Record of the Invasive Mosquito Species *Aedes* (*Stegomyia*) *albopictus* (Skuse)(Diptera: Culicidae) in Southern Iran. *Iranian Journal of Public Health*. 2016;45(8):1064-73.