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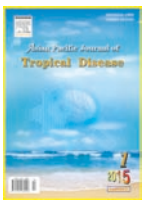

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New human pathogenic dengue like virus infections (Zika, Alkhumraand Mayaro viruses): a short review

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ABSTRACT

Dengue is an important pathogenic arbovirus that causes acute febrile illness with hemorrhagic complication. This disease is an important tropical disease that is the present public health threat. To diagnose dengue, it is usually based on clinical diagnosis. However, there are many dengues like infections that can be easily missed diagnosed. In the past decades, there are many new emerging dengues like infections that should be mentioned. Here, the authors briefly review on 2 important new human pathogenic dengue like virus infections (Zika, Alkhumra and Mayaro viruses).

1. Introduction

Dengue is an important pathogenic arbovirus that causes acute febrile illness with hemorrhagic complication. This disease is an important tropical disease that is the present public health threat[1]. To diagnose dengue, it is usually based on clinical diagnosis[1]. Basically, the dengue patient usually has acute high fever and develops hemorrhagic problem. The tourniquet test can show positive result[2] and routine laboratory can show hemoconcentration, atypical lymphocytosis and thrombocytopenia[1]. With observation of the described clinical features, the patients, in the dengue endemic area, are usually diagnosed for the illness[1,3]. However, there are many dengue like infections that can be easily missed diagnosed. The good example is Chikungunya virus which has similar clinical features to dengue but more predominant arthralgia[1]. In the past decades, there are many new emerging dengue like infections that should be mentioned. Here, the authors briefly review on important new human pathogenic dengue like virus infections (Zika, Alkhumra and Mayaro viruses).

2. Zika virus infection

Zika virus infection is a new emerging arthropod borne viral infection[4]. Virologically, Zika virus is a flavivirus[4,5]. Zika virus has a lot similarity to other arboviral infections[4,5]. Clinically, the manifestation of Zika virus infection is a feature of acute viral illness. However, this feature shares a lot similar to dengue and also other common arboviral infections in the tropical world. Due to the common clinical presentation, the problem in diagnosis can be expected. The main problems are missed and underdiagnosis of Zika virus infection. This problem can be expected in the endemic area of dengue.

Since the simple clinical signs and symptoms as well as basic laboratory investigation, such as complete blood count, cannot be used for differentiation, specific test is needed. The most simple way is to use basic dengue serological test. However, it should be noted that that basic serological test that is widely used for confirmation of dengue can have some problems in diagnosis of Zika virus infection. Dengue IgM serology test can be false positive in Zika virus infection and this can be the problem in individual diagnosis as well as epidemiological record.

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Generally, Zika virus infection has its primary endemic area in Africa[4], Pacific and Southeast Asia[5]. However, some publications on imported case of Zika virus infection have been published for a few years[6-8]. The disease was believed to be carried from endemic area in Asia[6,7]. To diagnose Zika virus infection, the standard diagnosis depends on PCR test[9]. The diagnosis should be considered in cases of dengue like infection that lack for serological confirmation or present atypical dengue serological result. However, the cost effectiveness of diagnosis has to be further evaluated since the clinical management of the case is not different from classical dengue infection.

In fact, Zika virus is not a newly discovered virus[8]. The virus was firstly identified in Uganda in 1947 and continuously reported in some human cases[9]. However, Zika virus becomes a new concern when there was a big outbreak in Pacific, Yap, Micronesia[10].

In this outbreak, "illness characterized by rash, conjunctivitis, and arthralgia" are reported[11]. The patients also showed atypical dengue falsely seropositive[11]. However, the cases were not severe and there were no death case[11]. *Aedes* species mosquito is confirmed as vector of the virus[12,13]. The new concern on atypical modes of transmission, blood transfusion[14] and sexual contact[15] is also mentioned.

3. Alkhumra virus infection

Alkhumra virus infection is a new emerging arthropod borne viral infection[16]. Virologically, Alkhumra virus is a flavivirus[16]. Unlike Zika virus, this is an actual new virus that was firstly isolated "in 1995 from 6 patients with dengue-like hemorrhagic fever from Alkhumra district, south of Jeddah, Saudi Arabia[16]". This virus is closely related to the tick-borne Kyasanur forest virus. The main clinical manifestation of this viral infection is acute febrile illness. The hemorrhagic complication is common and there are also other atypical clinical presentations such as hepatitis and encephalitis[16]. Alkhumra virus infection is believed to be a kind of zoonosis. Madani *et al.* concluded that "the virus seemed to be transmitted from livestock animals to humans by direct contact with these animals and likely by mosquito bites[17]" and "ticks did not seem to be involved in the transmission of infection from animals to humans[17]." Luckily, this disease is presently confined in Saudi Arabia.

4. Mayaro virus infection

Mayaro virus infection is another important arthropod borne viral infection[18]. Virologically, Mayaro virus is a rarely but important South American Alphavirus responsible for dengue-like clinical features. The patients usually present with persisting arthralgias, which is resemble to Chikungunya virus and the serological test also shows cross reactivity to Chikungunya virus[18-20]. In fact, to diagnose Mayaro virus infection, the specific serological test can be used and there is an important observation on clinical problem of "severe and long-lasting polyarthralgia" that can be helpful for differentiating from dengue. The difficulty in diagnosis should be between Mayaro virus infection and Chikungunya virus infection.

Conflict of interest statement

We declare that we have no conflict of interest.

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