ZIKA VIRUS: A BRIEF REVIEW

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ABSTRACT

This review highlights the Zika virus which is considered a global concern due to its rapid pandemic potential and effect on humans, and according to its pandemic status, the World Health Organization declared on February 2016 it as a “Public Health Emergency of International Concern.” Therefore, we define the epidemiology of Zika virus in addition to its pathogenesis, diagnostic techniques, and treatment.

Keywords: Zika virus, Aedes genus, Transmission, Antiviral drugs, Pathogenesis.

INTRODUCTION

Zika virus was isolated for the 1st time in 1947 from the blood of a rhesus monkey in the Zika Forest, Uganda. Zika virus was isolated from many of mosquito species collected during the study of arboviruses in Africa and of fever in Asia. The first outbreak of Zika disease was reported in 2007 in the Western Pacific Island of Yap, followed by a larger outbreak in Polynesia – France in 2013 and 2014, with an estimated 30,000 symptomatic infections [1-6]. According to Zika epidemiology update from the WHO, the infection of virus distributed in 87 countries and territories in these regions: Africa, the Americas, Southeast Asia, and Western Pacific region.

In 2016, Zika infection has peaked in the Americas and reduced during 2017–2018 while in 2018, Ethiopia was the only new country that was added to the infected countries with Zika virus that was transmitted by mosquitos [7].

The WHO has defined and mapped a Zika virus affected countries into four major categories according to country or territory or subnational areas as follows (Fig. 1):

• Countries and territories with current or previous Zika virus transmission (dark blue)
• Countries and territories with established competent vector, but no known cases of Zika virus infection (light blue)
• Countries and territories with no known cases of Zika virus infection and no established competent vector (dark grey)
• Not applicable (light grey).

ZIKA TRANSMISSION

Mosquito bites
Zika virus transmits by the bite of mosquito species from the Aedes genus (such as Aedes aegypti and Aedes albopictus) which live in tropical and subtropical regions (Fig. 6). The first symptoms develop in a period of 3–12 days depending on the immunity and resistance of the human [2,6,20,28-31].

From mother to child
A pregnant woman can transmit the virus to her fetus during pregnancy through the placenta or at the time of birth causing fetal brain defects which may finally develop into miscarriage. Furthermore, Zika virus was found in the breast milk but without evidence of its transmission through breast milk and until now there is no information about the long-term effects of the virus on young infants infected after their birth [2,6,20,28-31,33].

Sexual contact
It can be passed through sex from a person with Zika to his/her partner, even if the symptoms did not appear in the infected person, many
studies showed the presence of Zika in the semen and vaginal fluids of patients, and it can remain in semen longer than in other body fluids such as vaginal fluids, urine, saliva, and blood (ZIKV was more detected in saliva than in blood) [2,6,20,27-31,33-35].

Organ transplantation and transfusion of blood
Transmission can be accrued through blood donation from an infected person without testing it [28,23]. According to a study carried out by Musso and Gubler [29,36], they found that 42 of 1505 of those donors were asymptomatic, but using polymerase chain reaction, they found Zika virus in their bodies [2,6,28-31].
DNA explained the ability of several drug candidates have been identified based on their effects on suppressing viral replication or improving its consequences on NPCs.

The early studies identified niclosamide as an effective antiviral drug according to its ability in the inhibition of ZIKV replication [48]. Other studies showed that the Hippocastrum hydrobromide cleared infection from NPCs in culture, whereas using amodiaquine dihydrochloride dihydrate with Hippocastrum hydrobromide can reverse transcriptional dysregulation [13,49].

Control and recommendations
It’s recommended to follow the prevention strategies combined with early detection of infection. Vector controlling plays an important role in limiting the disease including avoiding mosquito bites using mosquito repellent and the removal of identified breeding grounds and the use of bed nets, reducing sexual transmission using male and female condoms, in addition to avoiding travel to infected areas and many recommendations confirm testing the blood which is donated from an infected person [2,24,27,32,50].

CONCLUSION
Studies on ZIKV biology and its pathogenesis role showed the ability of the virus to cause severe complications including placental and congenital infection and nerve damaging. There are many unknown data about that such as ways of host restriction and immune evasion, the neurodevelopmental implications of congenital infection in humans.

It is believed that future of Zika virus is unpredictable but according to its spread which is similar to the spread of chikungunya virus and dengue virus, we suggest that this virus will become a serious global public health problem.

AUTHORS’ CONTRIBUTIONS
Both authors have contributed to the preparation of this review and editing of the manuscript.

CONFLICTS OF INTEREST
There are no conflicts of interest.

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