



Zika, An Emerging Zoonosis, Vector-Borne and Sexual Transmission Disease, A Multifaceted Threat to Future Generations

Hoda Sarizadeh ^a and Hassan Vatandoost ^{a,b*}

^a *Department of Medical Entomology and Vector Control School of Public Health, Tehran University of Medical Sciences, Tehran, Iran.*

^b *Department of Chemical Pollutants and Pesticides, Institute for Environmental Research, Tehran University of Medical Sciences, Tehran, Iran.*

Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Zika, is considered as an zoonotic, emerging vector-borne and sexual transmission disease, a threat to the next generation. The objective is to collect all the current informations about zika for providing a guideline for disease control. An intensive search of scientific literature was done in "PubMed", "Web of Knowledge", "Scopus", "Google Scholar", "SID". Result showed that this vector-borne disease also transmitted by sexual transmission and mainly affect on the forthcoming generation. Due to novel method of transmission of disease to human, global collaboration about disease control is required.

Keywords: Zika; aedes; sexual transmission; control.

**Corresponding author: Email: hvatandoost1@yahoo.Com;*

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1. INTRODUCTION

In nuclear medicine, which helps to understand various physiological and functional events in the human body, the way to obtain images is provided by keeping the radioactive material in the target organ [1-3]. Zika disease is a Zoonotic disease. The vector is *Aedes* (family: culicidae). transmission by female *Aedes* mosquito between sunrise and sunset, lays eggs on surface of the stagnant water, the eggs can abide in unfavorable conditions for long time (months). Several species of mosquitoes belonging to the subgenus *Stegomyia* and *Diceromyia* of *Aedes* are probably enzootic vectors in Asia and Africa. *Ae.albopictus* & *Ae.aegypti* are the main vectors (Fig.1). *Stegomyia*, black and white pattern, tiger Mosquito, tropical and subtropical areas, feeds the blood meal during the day, prefer to live close to human habitations. The breeding place of larvea are: pottery jugs, water storage tanks, empty pots, broken bottles. *Aedes aegypti* has

high vectorial capacity, feeds frequently on human, bite multiple human in a single meal, has an imperceptible bite, lives in nearby humans habitation community, It has been the main vector of American ZIKV outbreak. "*Aedes albopictus* was founded in Asia at the first, a suitable vector for 22 arboviruses, despite the short flight it has spread well, spread throughout tropical and subtropical areas by commercial trades and can exist in more temperate areas than *Ae.aegypti*. Several *Aedes* spp. have been implicated, including *Ae. aegypti*, *Ae. africanus*, *Ae. hensilli*, and *Ae. Albopictus*" [4-7]. "*Aedes* mosquitoes are widely distributed globally, and native habitats of most species are warm tropical and subtropical regions" [8-10]. Other nonvector modes of Zika virus transmission include congenital [11], perinatal [12], and sexual [13,14]. Possible transmission by blood transfusion [15,16], animal bite and laboratory exposure has been described.



Fig. 1. Vectors of Zika: *Aedes aegypti*, *Ae. albopictus*

2. RESULTS

2.1 Life Cycle of Zika in Mosquito

Mosquitos bite the infected patient, and then take the combination of Zika virus, pass through the epithelial midgut cell, settlement in the salivary gland, incubation is 5-10 days, find in the saliva, and then can infect the human. Zika transmission routes is presented in Fig. 2.

The disease has sylvatic cycle which is Monkey-mosquito-monkey by *Aedes* mosquito. Urban cycle is human-mosquito-human by *Ae.aegypti*, *Ae.albopictus*, *Ae.hensillii* (Fig.3).

2.2 Life Cycle of Virus in Human

Feeding blood by infected mosquito and then inject the zika to skin, effect of derma and epidermal cell, pass through the lymphatic, get to blood stream and finally infect the organs and tissue.

The Agent is Flavivirus (family:flaviviridae). Flavivirus closely related to other flaviviruses, Dengue, Yellow fever, Japanese encephalitis. It is first detected was in 1947 in the zika forest(Uganda). The zika virus was isolated on several occasions from *Ae.africanus* in 1948 . By 2000 only 12 cases of human disease had been reported, which fortunately were declared safe.

2.3 Symptoms of Zika

20% of patients show the clinical symptoms, similar to other arboviruses (as Dengue or Chikungunya), it has low grade fever, rash, arthralgia, myalgia, conjunctivitis. Its can be effect on adult, fetus and children. Clinical symptoms are: fever, rash, myalgia. Clinical symptom in 18% of patients have been observed. First endemic transmission in Brazil 240000-1300000 suspected cases. Microcephaly (Figs.4,5). It could be infected the monkeys and others mammalian.

2.4 Global Distribution of Zika

Global distribution of Zika is shown in Fig.6.

2.5 The Strategy of Treatment

There is no Zika virus vaccine so far. Vaccine candidates could be: nucleic acid vaccines live attenuated vaccines, inactivated whole virus vaccines and using antivirus drug

2.6 Personal Protection

Avoidance mosquito bite, using impregnated bednets, using permethrin insecticide for clothes, using insect repellents, and using screens on windows and doors.

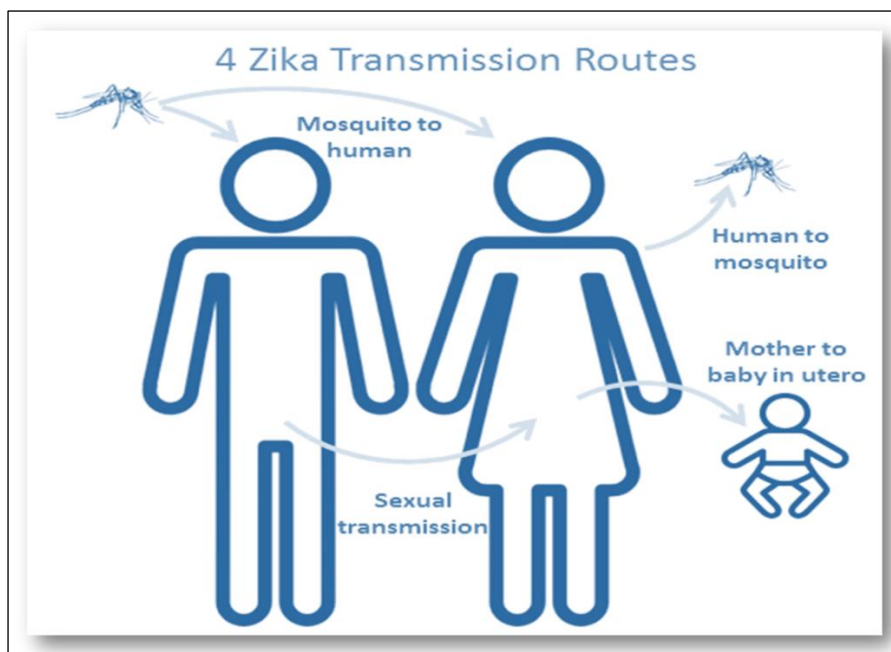


Fig. 2. Zika transmission routes

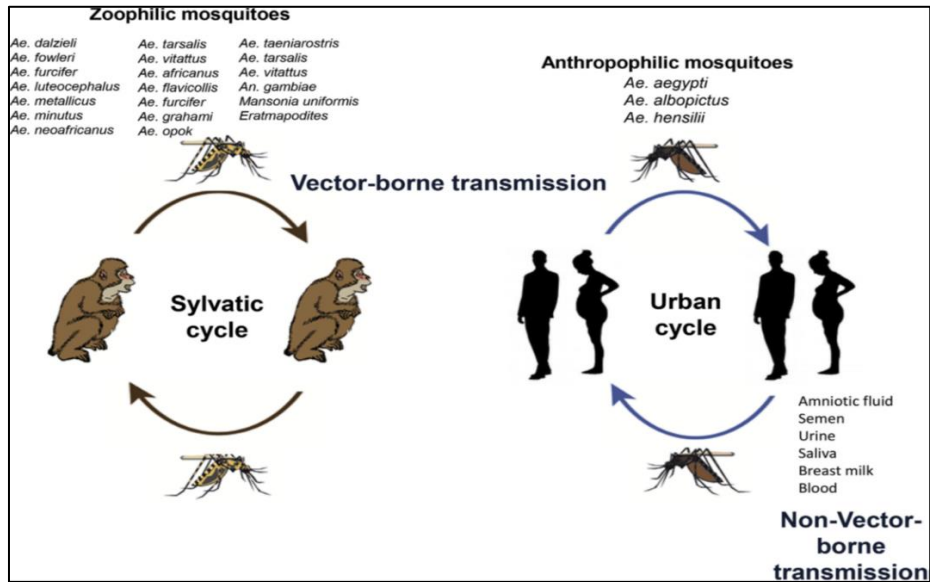


Fig. 3. Zika disease cycle





Fig. 4. Symptoms of Zika

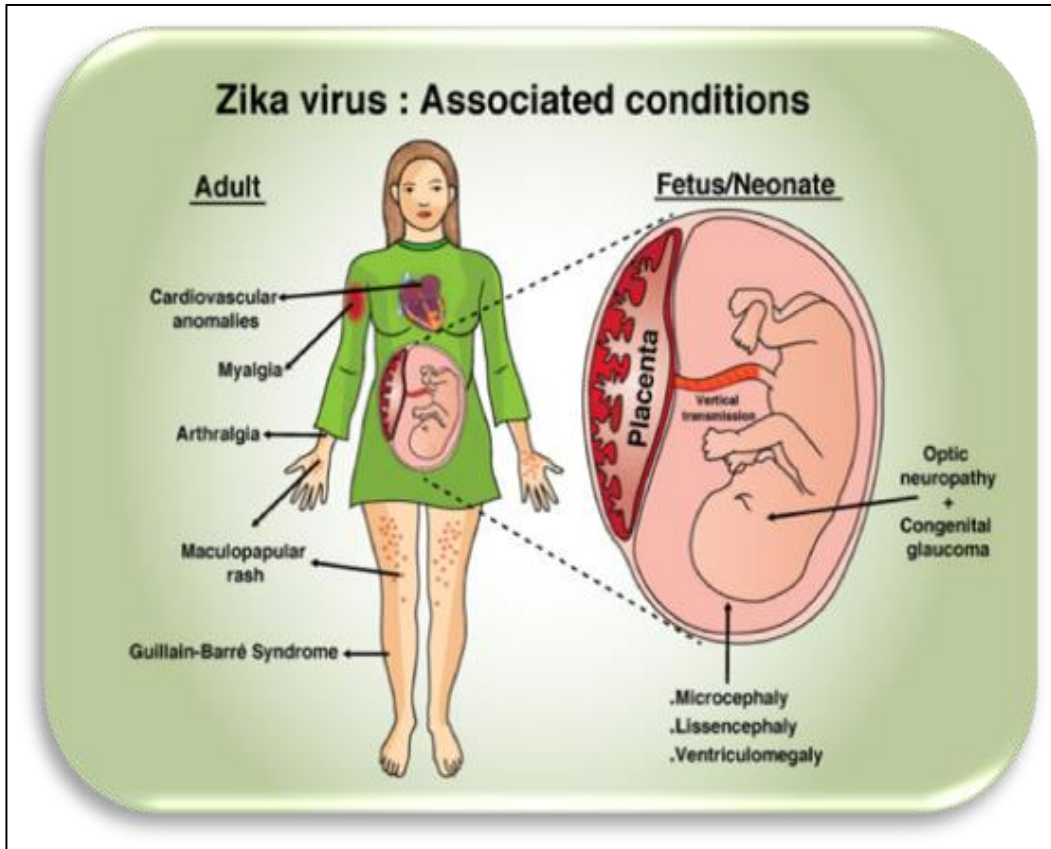


Fig. 5. Symptoms of Zik

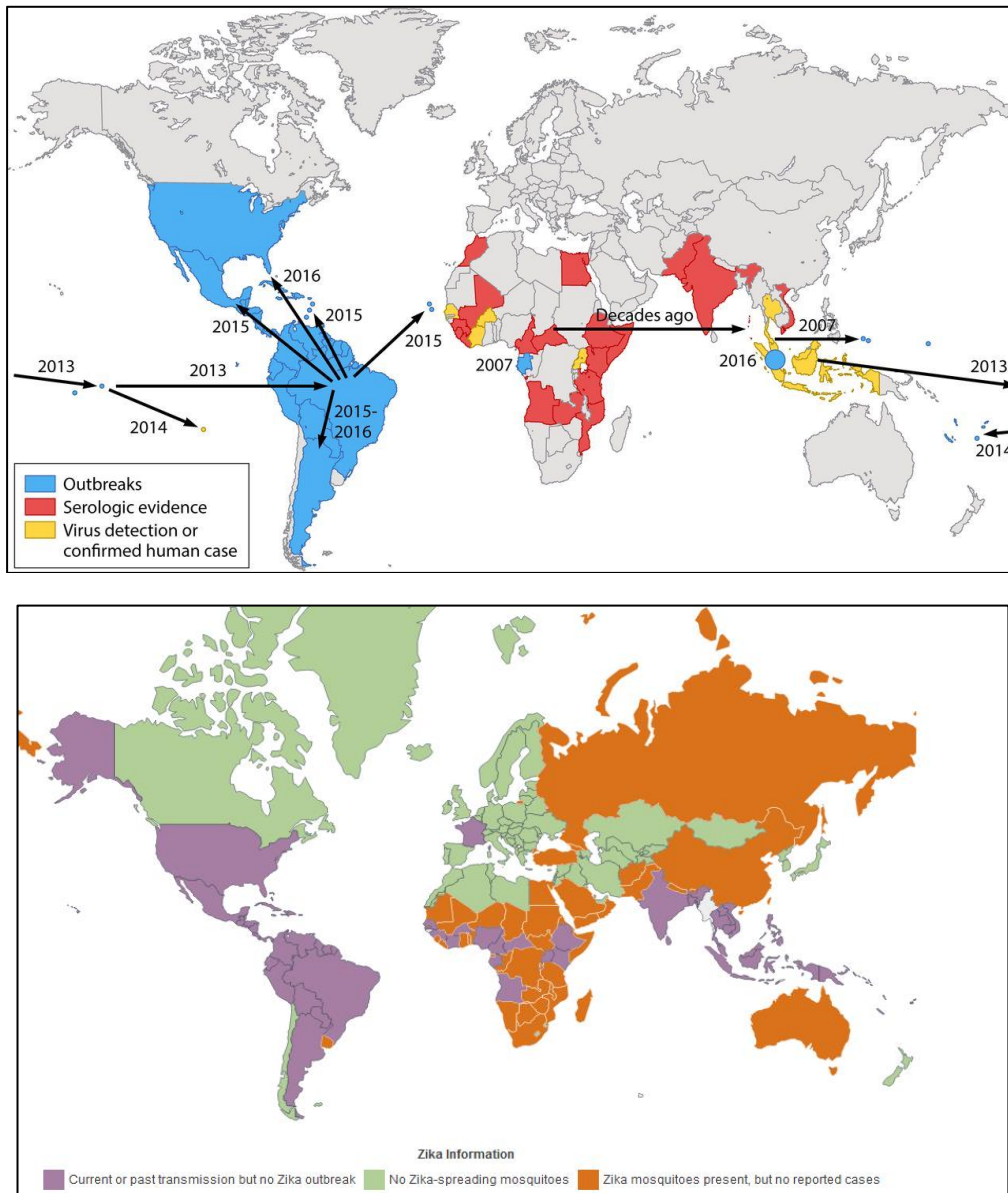


Fig. 6. Global distribution of Zika

3. DISCUSSION AND CONCLUSION

3.1 Global Strategy for Disease Control

“Most precarious threats for ZIKV infection are mosquitoes including their reproducing localities. Their encounter with humans must be reduced in order to control and prevent their outbreak. This can be employed by using mosquito repellents, mosquito nettings and closing the entrances and openings. Insect killing sprays, recommended by the WHO Pesticide Evaluation Scheme should be used as larvicides” [17, 18]. “Insect repellents should not be used for babies under two months, mosquito nets should be used to protect babies

from insect bite. Centre of disease control recommends mosquito repellents with active ingredients picaridin, DEET, eucalyptus oil, IR3535, oil of lemon and para-menthane-diol. These are safe for pregnant and lactating mothers” [19]. “Repellants containing eucalyptus oil, lemon oil and paramenthane- diol should be avoided for children below 3 years of age. Mosquitoes should be killed using indoor mosquito killing sprays which contain active ingredient Imidacloprid and β -Cyfluthrin available in market” [20]. “Flying insect fogger can also be used against the mosquitoes containing active ingredients Tetramethrin and Cypermethrin. Tests against ZIKV infection should be

performed before blood transfusions to prevent transfusion related transmission. Pregnancy must be avoided in the high risk ZIKV infection prone areas before complete eradication or extra care must be exercised as microcephaly is associated with ZIKV infection"[21]. "Other strategies include the use of intracellular bacteria *Wolbachia*, which acts as a biopesticide to control mosquito population"[22]. Rapid suppression of new populations, expansion and amplification of monitoring of these mosquitoes, establishment of quarantine system, regular and more accurate inspection of entry from native of such disease [23-32].

CONSENT

It is not applicable.

ETHICAL APPROVAL

Its not applicable.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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