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A Review Zika Virus-Old Wine in a New Bottle

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Abstract

Zika virus is a vector-borne flavivirus that serves a public health emergency is a still ongoing epidemic in the under developing countries, mostly Latin America. This uncertain virus was limited to sporadic cases in Africa and Asia until the emergence of Zika virus in Brazil in 2015 when it rapidly spread everywhere the Americas. Most of the Zika virus infections found to be subclinical or characterised by mild hot disease. However, neurological difficulties, including Guillain-Barré syndrome in adults, and congenital aberrations, including microcephaly in infants born to infected mothers, raised a serious concern. Currently, there is no specific antiviral medication or vaccine ready for Zika virus infection. Thus, global public health response is primarily focused on countering infection, alone in pregnant women, and on implementing up-to-date support to reduce the risk of non-vector transmission of Zika virus

Keywords: Zikavirus; Host-parsiteinteraction

Introduction

ZIKV was identified in the year 1947 from a Rhesus monkey in the Zika Forest of Uganda Prior to 2007, seroprevalence studies in Asia and Africa suggested ZIKV infections occurred regularly without a sign of severe infection. Outbreaks of ZIKV arose in 2007 on Yap Island in the Federated States of Micronesia followed by an epidemic in French Polynesia in 2013. Historically, Zika virus (ZIKV) infection caused a mild, self-limiting febrile illness that was associated with conjunctivitis, rash, headache, myalgia, and arthralgia [1-6]. However, during the recent epidemics in Asia and the Americas, more severe and unusual clinical consequences have been observed. Infection of fetuses during pregnancy, particularly during the first trimester, has been associated with placental insufficiency and congenital malformations including cerebral calcifications, microcephaly, and miscarriage [2,3,4-6]. In adults, ZIKV ranks as the most frequent disease among women and men with age 0-28 years of age infection is linked to an increased incidence of Guillain- –Barre´ syndrome (GBS), an autoimmune disease characterized by ascending paralysis and polyneuropathy [7-12] that occurs during the acute phase of ZIKV infection or shortly afterward [8–10]. We have seen in increase in the publication of research paper day by day exponentially and numerous open access journal came to existence to provide more information and precaution to overcome the diseases, literally to say nearly about 250 research paper published in one day from different geographical arena.

CDC has updated its guidance for world health organisation providers caring for women of reproductive age with possible Zika virus susceptibility to include guidance on counselling women and men with possible Zika virus susceptibility who is

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interested in superfetation [13-18]. European-Society-of-Clinical-Microbiology-&-Infectious-Disease based in Switzerland founding in 1983, ESCMID has evolved to become Europe's leading society in clinical microbiology and infectious diseases with members of all European countries and complete continents around the globe. This guidance is based on limited accessible data on the constancy of Zika virus RNA in blood and semen. Women who have Zika virus infection should wait at least 8 weeks after symptom start to attempt apprehension, and men with Zika virus disease should wait at least 6 months after symptom onset to attempt conception. Saint-Petersburg-State-University comprises of the study of parasitic systems – which can be defined as a complex of species populations of the hosts united by the parasite population into a general supra-system in the parasite system for understanding the locally condition with temperature[19-25].

Zika virus can be spread from infected men and women through vaginal, oral or anal intercourse. Olger Calderon-Arguedas, is a professor in Parasitology University of Costa Rica with the research interest agents of vector borne disease, study of arthropod, study of the ecology of Rickettsia and present research interest on the zika. Zika virus RNA has been detected in blood, semen, cervical mucus and vaginal fluid. Currently, the CDC advises that infected men's need to wait up to six months, and infected women two months approx., prior to attempting pregnancy. Reproductive tissue donors should wait 6 months before giving a specimen [26-32]. Lalitha Gupta is working as Professor of Biological Sciences Laboratory of Molecular Parasitology and Vector Biology at Birla Institute of Technology & Science, India with research interest understanding the dengue and Plasmodium development [33-35].

Challenges behind the ZIKV vaccine

This disease is attributed in part to ADE, whereby cross-reactive antibodies from the first DENV infection bind but fail to neutralize the second DENV serotype, and instead augment infection in myeloid cells expressing Gamma receptors [43]. This phenomenon could be relevant to ZIKV vaccination because DENV and ZIKV are related closely to one another, the two viruses co-circulate, and their infections produce cross-reactive antibodies targeting the highly conserved DII-FL epitope of the E protein. Indeed, studies in cell culture have confirmed that ADE can occur reciprocally, with DENV and ZIKV antibodies augmenting infection of ZIKV and DENV, respectively [30, 46-50]. Moreover, anti-ZIKV human monoclonal antibodies can enhance DENV infection and disease in mice [51-52] and reciprocally, anti-DENV and anti-WNV polyclonal antibodies enhanced ZIKV infection and disease in mice [53-57]. If ZIKV antibody responses are shown to augment DENV infection and disease in humans, vaccine strategies that minimize the generation of cross-reactive antibodies may be required to avoid sensitizing ZIKV vaccine recipients to severe DENV infections. In this case, soluble E protein or virus-like particle (prM-E) antigens that abrogate the DII-FL epitope but retain other protective epitopes may be useful [44,54,58-63]. (b) Guillain–Barre´ syndrome. Zika virus vaccine development Fernandez and Diamond. Currently, there is an epidemiological association between ZIKV infection and GBS, although a causal link has not yet been established. The pathogenesis of GBS might be due to direct ZIKV infection of neurons and glial cells in the spinal cord or to autoimmune-mediated targeting, possibly due to antibodies or T cells that cross react between viral and host antigens [10,64-69].

Beyond the generation of an immunogenic vaccine that elicits protective humoral and cell-mediated immunity, there are unique challenges to developing a ZIKV vaccine: (a) Immune enhancement of heterologous DENV infection [36-40]. The DENV complex is comprised of four genetically related serotypes. Olger Calderón-Arguedas publishes his review article with a title "*Zika Virus (ZIKA: New Emerging Pathogen Transmitted by Aedes Mosquitoes (Diptera: Culicidae) in the Latin American Subcontinent*" whereas primary infection with DENV generates a protective antibody response that protects durably against the homologous serotype, secondary infection with a heterologous DENV serotype can result in a severe

capillary permeability shock syndrome. *Entomological Impact and Current Perceptions of Novaluron and Temephos against the Aedes Aegypti (Skuse) Vector of Dengue, Chikungunya and Zika Arboviruses in a Coastal Town in Ecuador* deals with the were compared in a field trial in Colonche, Ecuador against Aedes aegypti (Skuse). Community perceptions of dengue fever along with acceptance of new methods were evaluated [41-45].

Prior to deployment of a ZIKV vaccine, it will be important to confirm that the elicited humoral or cellular anti-ZIKV responses in humans do not promote the development of GBS. (c) Pregnancy. Many vaccines are avoided during pregnancy due to the possible risks of infection or inflammation to the developing fetus. Indeed, vaccination prior to pregnancy remains the desired approach. Notwithstanding this, retrospective analysis of administered live-attenuated or inactivated vaccines has failed to establish conclusively adverse outcomes in fetuses of vaccinated mothers [70-75].

The current recommendation is to administer vaccines if the disease risk outweighs the potential of vaccine related effects [76-80]. Several recent studies suggest a relatively high frequency of adverse neurodevelopmental effects of fetuses of symptomatic and asymptomatic pregnant women following ZIKV infection [6, 81-84]. With current information, it remains difficult to determine whether the risk of exposure to ZIKV in utero surpasses that associated with immunization with certain classes of vaccines.

Conclusion

While optimism remains high for generating protective vaccines against ZIKV across multiple platforms, questions remain about their safety because of the unique clinical manifestations of ZIKV and its genetic and serological relatedness to DENV. Parallel discovery and epidemiological efforts are needed to address these issues prior to widespread implementation of a ZIKV vaccine [85-90].

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