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Zika Virus – An Overview

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S. Gopi Krishnan*[1], J. John Wesley[1], K. Brindha

Department of Pharmacology [1],
S. A. Raja Pharmacy College, Vadakkangulam,
Tirunelveli Dist, Tamilnadu, India-625020.

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ABSTRACT

Zika virus is a mosquito-borne Flavivirus that is the focus of an ongoing pandemic and public health emergency. It was first isolated in 1947 from the febrile rhesus macaque monkey in the Zika forest of Uganda and later identified in *Aedes africanus* mosquitoes from the same forest(1). Historically symptomatic Zika virus infections were limited to sporadic cases or small clusters of patients. The first major outbreak of Zika virus infection occurred in yap (federation state of micronesia) where 73% of the population are infected and symptomatic disease developed in 18% of infected patients(2). This review article describes the new information about Zika virus and we studied a literature review to summarize the Zika virus and the review contextualize the ongoing Zika virus epidemic in worldwide.

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INTRODUCTION

Zika virus is a flavivirus, belongs to the family flaviviridae. Zika virus disease is caused by a virus transmitted primarily by *Aedes* mosquitoes. It was first identified in Uganda in 1947 in monkeys through a network of yellow fever. Later it was identified in humans in 1952 in Uganda and rest part of the world[3]. It mainly occurs in tropical climates. The infection, Known as Zika Virus, often causes no (or) only mild symptoms, similar to a very mild form of dengue fever. Like other flaviviruses, Zika virus enveloped and icosahedral and has a non-segmented, single strainted RNA genome. A positive sense RNA genome can be directly translated into viral proteins, RNA genome encodes seven nonstructural proteins and three structural proteins [4, 5, 6, 7, 8]. There is scientific consensus that Zika virus is a cause of microcephaly and Guillain-Barre syndrome. Hence the review article reveals about the Zika virus about who's most affect and why, symptoms and treatment and how to protect against Zika.

Sign and symptoms:

Initially, there are no symptoms in incubation period (or) will only have mild problems, the most common are fever rash, joint pain (or) red eyes, malaise other symptoms include muscle pain and headache, symptoms can last for several days to a week.

Transmission:

Zika virus is primarily transmitted to people through the bite of an infected mosquito from the *Aedes* genus; mainly *Aedes aegypti* in tropical regions. *Aedes* mosquitoes usually bite during the day, peaking in early morning and late afternoon/ evening. *Aedes* mosquito also transmits dengue, chikungunya and yellow fever. Other common modes of transmission such as blood transfusion are being considered.

Clinical manifestation:

In human, the incubation period from mosquito bite to symptom onset is 3 -12 days, where the infection is likely asymptomatic in 80% of cases and also all ages are susceptible (4 days to 76 years) mainly microcephaly have marked increased in many cases[9]. The baseline rate of microencephaly is unknown, but the substantial proportional of infants reported. A neuropathologic link between Zika virus and CNS anomalies is supported by research showing viral neurotropism in Intradermal infected Mice and progression of disease

indirectly infected mouse brain. Zika virus plays a role in CNS malformations in viral replication and also some cellular proteins have a dual role in autophagy and centrosomes stability; a normal number of centrosomes are important for brain development. In case of zika affected patients, there is an increased number of centrosomes results microcephaly.

Therefore Zika virus interference in autophagy has been hypothesized to lead to an increase in centrosome number and microcephaly and also severe neurologic conditions like meningitis, meningoencephalitis, Guillain – Barre syndrome, where non-neurologic conditions include transient hearing loss, hypotension, genitor-urinary symptoms and hematospermia[10,11].

Laboratory findings:

Finding for Zika virus is limited, complete blood count is often normal, even if blood is abnormal, changes may be non-specific like mild lymphopenia, mild neutropenia, mild to moderate thrombocytopenia, mild elevation in inflammatory markers.(C- reactive protein, fibrinogen and ferritin) serum lactate dehydrogenase (or) liver enzymes. These findings are observed in many other viral infections, like DENV and CHIKV.

Diagnosis:

Clinical evaluation alone is unreliable for a diagnosis of Zika virus infection. Evaluation for Zika virus, CHIKV and DENV should be undertaken. Concurrently for all patients, who have an acute fever, rash and myalgia or arthralgia after recent travel to an area of ongoing Zika virus transmission.

Commercial assays have been developed, including a PCR- based assay that has been approved by the communaute europeenne and a serologic assay that has been approved by the US food and drug administration for the restricted use in emergency situations. Appropriate test is selected by the laboratory on the basis of clinical information provided by the requesting healthcare provider. Molecular amplification (e.g. RT-PCR) on serum samples remains the most specific diagnostic approach and is the preferred testing method for the zika virus during the acute phase of illness.

Serologic testing has limitations, Zika virus IgM and IgG are notoriously cross-reactive with those against other flaviviruses [12]. The type of sample can also affect the probability of detection. Although diagnostic testing is performed primarily on serum or cerebrospinal fluid,

the diagnostic utility of other specimen types (e.g. - urine, saliva, amniotic fluid and tissues) is being evaluated.

Management and prevention:

No specific treatment or vaccines are available for Zika virus infection, management is supportive and includes rest, fluids, antipyretics and analgesics, aspirin and other NSAID drugs should be avoided until the dengue is excluded. Because of the risk of hemorrhage among dengue patients.

Other general measures focus on prevention of mosquito bites, including individual protection; particularly during known *Aedes aegypti* peak biting times (early morning and late afternoon), community level strategies target mosquito breeding through elimination of potential egg laying sites (e.x: potted saucer, water storage units and used tyres) by drying wet environmental of using insecticide treatment.

RESULTS AND DISCUSSION

Zika virus has been declared a public health emergency; as many as 1.3 million persons have been affected in worldwide. Because of the ease of air travel and international trade, further spread into regions, where the virus is not endemic is likely and transmission is probably in location with competent mosquito vectors. A robust multifaceted response is underway that involves public health authorities, government agencies, the biomedical industry, medical practitioners and researchers. As the epidemic unfolds evaluating incoming data critically will be necessary to separate fact from speculation. Commercial tests for zika virus are limited in number and available more are in development including prototype. Multiplex molecular assays that concurrently test for Zika virus, CHIKV and DENV aspects of Zika virus, pathogenesis remains unclear.

Zika virus association with neurologic sequence including the potential neuropathophysiological mechanism is being actively investigated. Continued epidemiologic study combined with research involving animal models will often increase insights.

Which could spur novel prevention strategies. Given reports of possible transfusion-transmitted Zika virus, the pandemic also has implicated for the blood supply with Zika virus endemic and non-endemic regions. The endemic has serious medical, ethical, and economical

ramification, particularly in many countries. Where the resource for early diagnosis are lacking and potential intervention measures.

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