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Case Report

Chikunguniya

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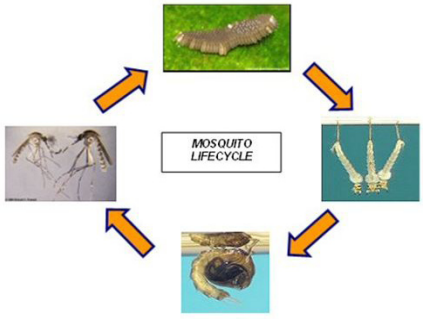
History

Chikunguniya is a mosquito- borne viral disease first described an outbreak in southern Tanzania in 1952. It is an RNA virus that belongs to the alpha virus genus of the family Togaviridae. The name "Chikunguniya" derives from a word in the kimakondae language, meaning "to become contorted", and describes the stooped appearance of sufferers with joint pain. . In India it was seen in Calcutta, in the year 1963.

Introduction

Chikungunya is a relatively rare viral fever that is caused by the bite of infected mosquitoes. The virus is spread between people by two types of mosquitoes: - 1. Aedes albopictus 2. Aedes aegypti. They mainly bite during the day. The virus may circulate within a number of animals including birds and rodents Outbreaks have taken place in many tropical countries. Recently it has resurfaced in many parts of India including Gujarat, Maharashtra, and Andhra Pradesh. Since, there is a lot of interstate movement; no area is free from Sporadic of Chikungunya.



Symptoms

- Most people infected with chikungunya virus will develop some symptoms.
- Symptoms usually begin 3-7 days after being bitten by an infected mosquito.
- The most common symptoms are fever and joint pain.
- The disease may be asymptomatic, but generally is not, as 72% to 97% of those doubt symptoms may include headache, muscle pain, joint swelling, or rash.
- Chikungunya disease does not often result in death, but the symptoms can be severe and disabling.
- Most patients feel better within a week. In some people, the joint pain may persist for months.
- People at risk for more severe disease include newborns infected around the time of birth, older adults (≥65 years), and people with medical conditions such as high blood pressure, diabetes, or heart disease.
- Chikunguniya is characterized by an abrupt onset of fever frequently accompanied by joint pain. The symptoms can be mistaken for those of dengue fever and zika fever.
- Often symptoms in infected individuals are mild and the infection may be going recognized, or be misdiagnosed in areas where dengue occurs.

Recognisation of Disease

Sometimes there is confusion in dengue and chikunguniya because both are the viral diseases with very similar symptoms. Both the patient has symptoms such as high fever, headache, eye pain, joint pain and rash. Both are viral infection spread by Aedes mosquito. However identifying the exact disease is critical since dengue is much more dangerous and may need emergency medical intervention. It is also possible for a patient to have dengue and chikunguniya at the same time. They are identified by only the duration of disease in chikunguniya the incubation period of 1 to 12 days and disease duration varies from one to two weeks while in dengue the incubation period of 3 to 7 days and disease duration varies from 4 to 7 weeks.

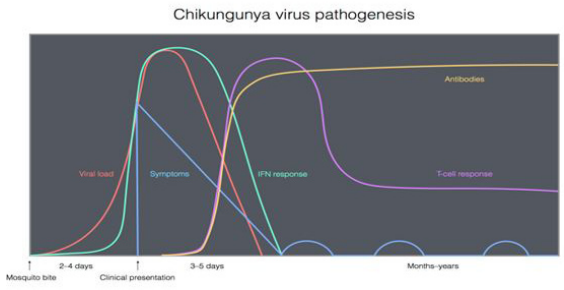
Pathophysiology

Chikunguniya has been identified in over 60 countries in

Asia, Africa, Europe and the America. It is generally transmitted from mosquitoes to humans. Less common mode of transmission include vertical transmission, which is transmission from mother to child during pregnancy or at the birth. Transmission via infected blood products and through organ donation is also theoretically possible during times of outbreak, through no cases have yet been documented. The chikunguniya virus is passed to human when a bite from an infected mosquito breaks the skin and introduces the virus into the body. The pathogenesis of chikunguniya infection in human is still poorly understood, despite recent outbreaks. It appears that in vitro, virus is able to replicate in human epithelial and endothelial cells, primary fibroblasts, and monocyte- derived macrophages. Viral replication is highly cytopathic, but susceptible to type-1 and type-2 interferon.

Figure: Aedes mosquitoes transmit chikungunya virus to people.

Chikungunya virus is primarily transmitted to humans through the bites of infected mosquitoes, predominantly Aedes aegypti and Aedes albopictus. Humans are the primary host of Chikungunya virus during epidemic periods. Blood-borne transmission is possible; cases have been documented among laboratory personnel handling infected blood and a health care worker drawing blood from an infected patient. Rare in utero transmission has been documented mostly during the second trimester. Intrapartum transmission has also been documented when the mother was viremic around the time of delivery. Studies have not found Chikungunya virus in breast milk. The risk of a person transmitting the virus to a biting mosquito or through blood is highest when the patient is viremic during the first week of illness.



Cellular Tropism

Following transmission through bites by infected mosquito (Aedes aegypti or Aedes albopictus), Chikungunya Virus (CHIKV) replicates in the skin and fibroblasts, enters the bloodstream, and disseminates to the liver, muscle, joints, lymphoid tissues, and brain. After an incubation period of two to four days, affected individuals typically experience an abrupt onset of symptoms including high fever, rigors, headache, photophobia, incapacitating arthralgia, and rash characterized by petechiae and/or maculopapular lesions. Unlike other members of arthritogenic alpha virus, Chikungunya virus may also cause symptoms of meningoencephalitis and hemorrhagic disease. Cellular tropism in infected humans correlates with the results from tissue culture experiments which showed replication of CHIKV in various cell lines including epithelial cells, endothelial cells, fibroblasts, muscle satellite cells, and monocyte-derived macrophages [1,2].

Innate Immunity

In parallel with the development of acute symptoms, the upsurge of viral load triggers the activation of the innate immune response, hallmarked by the robust release of type Interferon's and other proinflammatory cytokines and chemokines, which may be crucial to the control of CHIKV replication. Production of type I Interferon's (IFNs) is initiated by the detection of pathogen-associated molecular patterns such as surface glycoprotein's, single-stranded or double-stranded RNA, and unmethylated CpG-containing DNA. Toll-like Receptor 3 (TLR3), TLR7, TLR8, Retinoic acid-inducible gene I-like receptors (RLRs), Melanoma Differentiation-Associated Protein 5 (MDA5), and other pattern recognition receptors (PRRs) have been suggested to engage the signalling cascade that leads to the activation of type I IFNs, which in turn triggers the transcription of interferon-stimulated genes that confer resistance to cells against CHIKV replication [3,4]. Transient lymphopenia during acute infection may also be explained by the effects of type I Interferon's rather than direct cytotoxicity of CHIKV, since B lymphocytes and T lymphocytes are not susceptible to CHIKV infection.

Adaptive Immunity

In addition to the innate arm of the immune response, T cells and antibody-mediated responses may also be involved in the rapid viral clearance that occurs approximately a week after infection. Relapsing rheumatic symptoms including polyarthritis and tenosynovitis have been reported in infected patients and may be related to the induction of autoimmunity caused by molecular mimicry between viral and host antigens.

Diagnosis

Chikunguniya is diagnosed on the basis of clinical, epidemiological and laboratory criteria. Clinically, acute onset of high fever and severe joint pain would lead to suspicion of chikunguniya. Epidemiological criteria consist of whether the individual has travelled to or spent time in an area in which chikunguniya is present within the last 12 days. Laboratory criteria include a decreased lymphocyte count consistent with viremia.

- There is a no specific antiviral drug treatment for chikunguniya.
- Supportive care and rest
- There has been no effective vaccine developed to prevent Chikungunya.
- To relieve symptoms of fever and joint pain the drug commonly used is paracetamol.
- Rest is indicated during acute joint symptoms. Movement and mild exercise may improve stiffness and morning joint pains.
- In unresolved arthritis that does not respond to aspirin and non-steroidal anti-inflammatory drugs, Chloroquine Phosphate (250 mg/day) has given some promising results.
- Aspirin should be avoided.
- The best treatment for Chikungunya is drinking 6 - 8 glasses of distilled water each day with a pinch of sea There is a no specific antiviral drug treatment for chikunguniya. Salt. This will hydrate and mineralize the body giving it the best ability to flush toxins and relieve body aches. Also take mega doses of Vitamin C.

Prevention

Prevention and control relies heavily on reducing the number of natural and artificial water- filled container habitats that support breeding of the mosquitoes. This requires mobilization of affected communities. During outbreaks, insecticides may be sprayed to kill flying mosquitoes, applied to surface in and around the container where the mosquitoes land. Repellents can be applied to exposed skin or to clothing in strict accordance with product label instructions. For those who sleep during the daytime particularly young children or sickor older people insecticide- treatment mosquito nets afford good protection. Mosquito coils or other insecticides vaporizers may also reduce indoor biting.

Chikunguniya Prognosis

Most patients recover fully from Chikungunya virus infection. They get better after a few days, however sometimes joint pain can persist for a longer period after the other symptoms have disappeared. Some deaths have been reported in a few countries but this may have been due to the inappropriate use of antibiotics and anti inflammatory drugs. As this virus can cause decreased platelets and result in bleeding one has to be careful that the drugs that are used do not further drop the platelets or cause bleeding due to gastric inflammation and erosions or ulcers (e.g. effect of Aspirin)

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