

CHIKUNGUNYA - AN EMERGING THREAT FOR BANGLADESH

Chikungunya fever is an emerging viral disease transmitted to humans by mosquitoes. Chikungunya Virus (CHIKV) is an arbovirus of the alphavirus genus (Togaviridae family). The *Aedes aegypti* and *Aedes albopictus* mosquitoes are the main vectors responsible for transmission of Chikungunya. In 1952, a young man in Tanzania admitted to hospital with fever, rash and arthralgia. Eventually he was diagnosed as the first case of Chikungunya.¹ In 2005–2006, a severe outbreak occurred on Reunion Island in the southwestern part of the Indian Ocean. Other islands in this area were affected during the same period. Estimated 300,000 people was infected and 237 patients died. The factors favoring this epidemic included viremic travelers from Africa, to an immunologically naive population. Mutation of the Chikungunya virus that expanded the mosquito vector from the *Aedes aegypti* to the *Aedes albopictus* which was common on the island.²⁻⁴ Mutation (E1A226V) improves replication and transmission efficiency in *Aedes albopictus* as well as the original *Aedes aegypti*, outbreaks spread to the Indian subcontinent.³ India has been suffering from outbreaks of Chikungunya since 2005 with variable severity. India and Bangladesh are two neighboring countries which share some similar epidemiological pattern.

Since 2000, Bangladesh experiencing the Dengue epidemic with same Vector. In a survey by DGHS (Directorate General of Health Services) and WHO, ratio prevalence of *Aedes aegypti* : *Aedes albopictus* is 25:1 in our Dhaka city. In Africa, reservoir are Human during epidemic period but monkey, rodent, bats are reservoir in inter-epidemic period. Unfortunately, in south east Asia reservoir status not yet been documented. We have our small three outbreak in 2008 at Rajshahi (Northern part, near Indian border) in 2011 at Dohar near Dhaka city, Palpara in 2012 near Dhaka.^{8,9} In 2017, Bangladesh experienced a large outbreak of Chikungunya just in early-monsoon in March when there was unexpected rain fall. Urban areas are affected specially Dhaka city. The health care providers are not fully aware and prepared for chikungunya virus fever, epidemics, phylogenetics, clinics and management. Public are

also not aware of this viral disease. This is totally new for all concern. In the last 3 months period hundreds and thousands of patients suffered from CHIKV fever but surprisingly very insignificant number of Dengue patients were reported.

This brings some different idea in mind because for both the viruses are borne by the same vector. Epidemiological, virological and zoonotic characteristics should be assessed which may be responsible for decrease in the case number of dengue due to the outbreak of chikungunya. This demands research and to understand the character of the new disease CHIKV.

We have experience of Dengue since 2000 and is under control for last one decade with almost no casualty. As on reported April 2016, Chikungunya is presently prevalent in 85 countries of the world including United States. Our neighbour country India had very huge outbreak in 2006. In the ongoing Indian outbreak, in which *Aedes aegypti* is the presumed vector, 1 400 000 cases of chikungunya were reported during 2006. The reasons for the re-emergence of chikungunya on the Indian subcontinent, and for its unprecedented incidence rate in the Indian Ocean region, are unclear. Plausible explanations include increased tourism, chikungunya virus introduction into a naive population, and viral mutation.¹⁰

Upon onset of the acute phase, the viral load of CHIKV can rise to 10^8 viral particles per milliliter of blood⁵, which enhances the development of the human-mosquito-human transmission cycle.⁶ The virus following the mosquito bite replicates in skin fibroblasts and then spreads via the bloodstream to target the liver, muscle, brain, joints, and lymphoid tissue.⁷ Release of cytokine produces fever. Replication of virus within synovium leads to immune complex mediated attack on endostium and periosteum leads to nondestructive arthritis.

Symptoms of CHIKV infection start abruptly with fever (temperature, usually $\geq 38.9^{\circ}\text{C}$). The fever typically last from several days up to 2 weeks and can be biphasic in nature. Shortly after the onset of fever, the majority of infected persons develop severe, often

debilitating polyarthralgia. Published reports suggest that rash is another common symptom. When it occurs, the rash appears after fever onset and is typically maculopapular involving the trunk and extremities but can also involve palms, soles, and the face. Additional symptoms that can occur during the acute illness include headache, fatigue, nausea, vomiting, and conjunctivitis; myalgia, although not specific for febrile illnesses, occur very commonly. Cervical lymphadenopathy can also occur in the acute illness; however, it is not seen as frequently as with o'nyong nyong fever, another alphavirus infection also associated with fever and arthralgias.^{11,12}

Following the acute phase of the illness, some patients develop prolonged symptoms, lasting several weeks to months, including fatigue, incapacitating joint pain, and tenosynovitis or edematous polyarthritides of their digits.¹¹ CHIKV infections are often confused with dengue viral infection, because both diseases can present with high temperature and myalgia in people living in or returning from tropical areas. In addition, both viruses are transmitted by the same species of mosquitoes and may co-circulate, leading to dual infections and concurrent epidemics. Although these diseases share similar clinical features, prominent and prolonged arthralgia affecting multiple joints are more consistent with CHIKV, and hemorrhage is more common in cases of dengue virus infection.^{13,14}

Incubation period of Chikungunya fever is 3 to 7 days but presentation is variable. Presentation of symptom may start with fever or arthralgia or simultaneously. Febrile period usually persists for 5 days. Rash may appear any time of the febrile phase or post febrile period. Muscle pain, fatigability, headache, backache, chill, nausea, vomiting and tender cervical and post auricular lymphadenopathy may present. In a resource poor country like Bangladesh can't afford laboratory confirmation of all the cases. So when a patient met the clinical and epidemiological criteria of Chikungunya infection he/she should get treatment. As Dengue fever and Chikungunya fever shares common manifestation, careful history, examination and investigations may give a clue to the diagnosis. Fever, arthralgia, arthritis, rash are more mark in Chikungunya than Dengue. Myalgia, Hemorrhage are more remarkable in Dengue fever. Lymphopenia and high CRP value present in Chikungunya but thrombocytopenia and high PCV in case of Dengue fever. Despite all these facts, rule out of Dengue infection by NS1 antigen or antibody test will be helpful for confident diagnosis of Chikungunya infection. Clinical presentation of Chikungunya

usually follows 3 phases a) Acute phase: Less than 3 weeks, b) Sub-acute phase > 3 weeks to 3 months, c) Chronic phase > 3 months. Acute symptoms typically resolve within 7–10 days. More than 90% of the symptoms resolve completely but some patient may have symptom like episodic stiffness and pain, persistent stiffness without pain, persistent painful restriction of joint movement. Rare complications include uveitis, retinitis, myocarditis, hepatitis, nephritis, bullous skin lesions, hemorrhage, meningoencephalitis, myelitis, Guillain-Barré syndrome, and cranial nerve palsies may develop. Some patients might have relapse of rheumatologic symptoms (e.g, polyarthralgia, polyarthritides, tenosynovitis) in the months following acute illness and leads to Chronic Chikungunya related arthritis or Chikungunya Rheumatism. For specific cases, confirmation can be done within 5 days by RT-PCR and after one week by MAC ELISA (Either IgM) or IgG for paired sample (First sample after 7 days of illness and second sample after 14 days of first sample). ICT based diagnosis is non-rewarding as the sensitivity and specificity is low. Treatment is entirely symptomatic. Paracetamol is the drug of choice with use of other analgesics if paracetamol does not provide relief. During the acute stage of the disease, steroids are not usually indicated because of the adverse effects. Controlling the spread of Chikungunya requires rapid diagnosis and education of clinicians and laboratory workers. Public awareness is the cornerstone of controlling spread as the vector *Aedes aegypti*: *Aedes albopictus* are day bite mosquito and grows in fresh water.

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