

## EDITORIAL

## AND YET ONE MORE ADDS TO THE SORROW

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Chikungunya is one of the vector borne diseases. It is caused by Chikungunya virus, an alpha virus, spread by the bite of female *Aedes* mosquito. Chikungunya is a non-fatal, self-limiting Dengue like illness which is characterized by high grade fever, headache, skin rash, and prolong debilitating arthralgia mostly affecting peripheral small joints. Treatment is usually supportive for the symptoms which includes antipyretic, analgesics and anti-inflammatory drugs. Current outbreak in Karachi is the first declared outbreak in Pakistan. To control the current outbreak, integrated vector management approach must be used to control *Aedes* not only to combat the current outbreak but also to reduce the endemicity and to prevent introduction of other *Aedes* borne diseases.

**Keywords:** Chikungunya; Vector Borne Disease; *Aedes*; Alpha virus

J Ayub Med Coll Abbottabad 2016;28(4):637-8

Vectors especially mosquitoes have been inhabitants of earth long before dawn of human race and probably will survive till the end of life. The mosquito has devastated the humans for very long and still contributes significantly to the global morbidity and mortality. Its ability to carry and spread pathogens unchecked to large population makes it one of the deadliest animals on the planet. Unlike revered predators, people misjudge the immense threat posed by a small bite of this arthropod. Historical estimates suggest that they have killed almost half of the humanity that has ever lived and currently around 1 million deaths annually are caused by mosquito borne diseases alone.<sup>1</sup>

Among the thousands of mosquito species on earth, very few are deadlier for humans than *Aedes* which is responsible for huge epidemics of Yellow Fever, Dengue Fever, Zika and Chikungunya.

Pakistan, with its population growth and unplanned urbanization, has allowed *Aedes* not only to thrive but wreak havoc with Dengue Fever and more recently with Chikungunya which has affected around 30,000 victims<sup>2</sup> in Karachi.

Chikungunya fever (CHIK) is caused by Chikungunya virus CHIKV which is a double stranded RNA alphavirus, belonging to family Togaviridae and spread by the bite of feeding female *Aedes* mosquito. The disease was first identified in Tanzania in 1952 (formerly Tanganyika) with the isolation of virus during outbreak of dengue like disease.<sup>4</sup> Since its discovery, outbreaks have been reported in 50 countries in Africa, South-East Asia, Indian subcontinent, Europe and America. CHIK exhibits interesting epidemiological profiles. The appearance of epidemics is usually cyclic with an inter-epidemic period of 7-8 years. The biggest outbreak till date has been reported from Indian Ocean islands and India between 2005-2007 affecting around 2 million people.<sup>5</sup> Historical review of cases suggest that the CHIKV epidemics have occurred

long before its discovery as early as in 1779 but were falsely reported as Dengue fever outbreaks because of its similarity with the later.<sup>6</sup> In Pakistan the CHIKV was first isolated in 1983<sup>7</sup> and more recently virus was isolated from 3 patients during Dengue outbreak in Lahore<sup>8</sup>.

CHIKV is maintained by sylvatic cycle involving non-human primates in Africa and due to endemicity and high concentration of virus in circulation in Asia, the virus is spread by humans-mosquitoes-humans transmission cycle. In addition to vector borne transmission, CHIKV can be transmitted vertically from mother to child or by transfusion of infected blood products and infected organs.

CHIK is a non-fatal, self-limiting Dengue like illness which is characterized by high grade fever, headache, skin rash, and prolong debilitating arthralgia mostly affecting peripheral small joints. The name of the disease is derived from local Makonde word meaning "that which bends up." This is reference to the stooped posture many patients develop consequent to the painful joints.<sup>9</sup>

After incubation period of 3-7 days, unlike Dengue fever, majority of the infected will develop symptoms of fever more than 102 °F and joint pains in viraemic stage. The joint pains can be attributed to the replication of CHIKV in fibroblasts and myofibers.<sup>8</sup> Loss of taste may be reported by some patients. This is due to the CHIKV attacking nerve endings of the tongue and desensitizing the taste buds in the process.

Convalescence usually follows which lasts for around 10 days. In some patients, the disease may take a more chronic turn with persistence of joint and muscular pain lasting months or even years.

Serious complications are rare and occasional cases of retinitis, hepatitis, Guillain-Barre syndrome, encephalitis, cranial nerve palsies, haemorrhagic manifestations etc. have been reported in larger outbreaks. Groups that are more prone to

complications are adults above 65 years, neonates exposed intrapartum and people with underlying metabolic, cardiovascular and renal disorders. Deaths from CHIK are rare and the few deaths that are attributed to it were in older patients with pre-existing medical conditions

Preliminary diagnosis is based on clinical features, case definition and travel history to CHIK endemic areas. Confirmation requires serological tests most commonly RT-PCR and ELISA. During the first week after the onset of symptoms when viraemia is high, RT-PCR is preferred tool for diagnosis. Antibodies (IgM) start appearing at the end of first week and achieve its peak concentration 3-5 week after the onset of symptoms and therefore ELISA is performed during convalescence phase to detect the antibodies against CHIKV. People with signs and symptoms suggestive of CHIK with negative labs early on must be re tested during convalescence for confirmation.

CHIK is usually self-limiting disease and treatment is usually supportive for the symptoms. With primary signs and symptoms including fever and joint and muscular pains, the treatment mostly centres on their management and includes antipyretic, analgesics and anti-inflammatory drugs. In addition to these drugs, bed rest and appropriate fluid intake is also recommended. Chloroquine Sulphate has shown promising results in chronic arthritis cases who are not responding to anti-inflammatory drugs or their prolong use poses threat of serious side effects,<sup>10</sup> More recently, antiviral drugs like ribavirin, Interferon- $\alpha$  etc. have been evaluated in treatment of CHIK associated arthritis and have shown potent antiviral activity, thus opening possibility of antiviral in the management of CHIK.<sup>11</sup>

Extensive work has been carried out on the development of vaccine against CHIKV. Although some of these vaccines have shown promising results in phase-I trial yet, no licensed vaccine is available so far which could be deemed safe for the masses.

Current CHIK outbreak in Karachi is the first declared outbreak in Pakistan and is one of the largest in the region. The magnitude of this outbreak has taken the Health Department and government by surprise, although the vector, *Aedes*, has been dwelling in this area for a long time with high vector density. Malir, Karachi which is the epicentre of CHIK outbreak, provides a perfect breeding place for *Aedes* with its temperate climate, stagnant water and

garbage dumps. The only way to prevent morbidity and in some cases mortality from CHIK is to prevent mosquito bite. It seems difficult to prevent the bite, as it has been evident from the endemicity of Dengue fever in the area, unless personal protective measures and reduction in vector density is achieved.

To control the current outbreak, the decision makers in government need to establish effective and operational collaboration between different departments. This will ensure optimal utilization of resources for elimination of the breeding places and will generate required awareness among people for adequate prevention against mosquito bite. In addition, integrated vector management approach must be used to control *Aedes* not only to combat the current CHIK outbreak but also to reduce the endemicity of Dengue fever and prevent introduction of other *Aedes* borne diseases like Yellow fever, West Nile fever, Equine encephalitis etc. in the future.

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