BANGLADESH J CHILD HEALTH 2017; VOL 41 (1): 1-3

Leading Article

Chikungunya Fever: An Emerging Infection in Bangladesh

SYED SHAFI AHMED MUAZ

Introduction

Chikungunya fever is an emerging viral illness that is spread from human-to-human by the bite of virus-carrying Aedes mosquitoes.[1-3] The name is derived from the Mekonde word meaning 'that which contorts or bends up' in reference to the stopped posture developed as a result of the arthritic symptoms of the disease.[4] Chikungunya virus or CHIK virus is a Group IV (+) RNA virus belonging to family Togaviridae, Genus Alphavirus and species Cikungunya virus.[4-7] *Aedes aegypti* is the main vector of transmission of Chikungunya in Bangladesh. However, Aedes albopictus has also been found to be playing a part in some areas.[5] The *Aedes* mosquito breeds in domestic settings such as flower vases, water-storage containers, air coolers, etc and bites during day time.[6]

Epidemiology

Chikungunya fever occurs in both sporadic outbreaks and large epidemics. Sporadic cases are regularly reported from different countries in the affected regions, following the report from Tanzania in 1952. Globally Chikungunya fever epidemics have been reported from several countries in Africa, Asia, and other parts of the world. In Asia, epidemics have been documented in India, Sri Lanka, Myanmar, Thailand, Indonesia, the Philippines, Cambodia, Vietnam, Hong Kong and Malaysia. Since 2004, intense and widespread outbreaks have been reported in Africa, islands of the Indian ocean, and the Pacific region, including Australia and south-east Asia (India, Indonesia, Myanmar, Maldives, SriLanka, and Thailand). In 2007 the virus spread to the Emilia-Romagna region of Italy, where an outbreak was transmitted by *Aedes albopictus*.[3] In Bangladesh, the 1st outbreak was in Poba upozilla in Rajshahi district affecting 32 people in 2008. The 2nd outbreak was in Shathiya upazilla of Pabna in 2009. In 2011, the 3rd outbreak of Chikungunya fever has been discovered in Dhaka, Dohar & Nababganj of Dhaka district & also in Shibganj of Chapainababganj. According to the information of Prothom Alo on 24th November, this is the 3rd outbreak in Bangladesh.[4] The Institute of Epidemiology, Disease Control and Research (IEDCR) in Dhaka has reported the presence of Chikungunya in the capital city of Dhaka. IEDCR only confirmed the presence of Chikungunya in the capital after testing bloods from households of four different corners. The report notes that IEDCR team had collected blood samples in Aug and Sep 2013 from every 10th house, a total of 600 people, in the Sutrapur, Dhanmondhi, Motijheel and Mohakhali areas had found recent infections in 33 percent people among the tested blood in addition, three percent have been found with past infections.[5] Chikungunya is spreading in the capital with sporadic rains in the earlier part of 2017 but actual magnitude is much higher than the figure IEDCR got.[6,7] People affected with Chikungunya disease are believed to be more in some areas of Dhanmondi, Kalabagan, Green Road, Hatirpool, Lalmatia, Malibagh, Basabo, Gulshan, Uttara and Mirpur in the capital. There are also patients coming from different districts and upazilas outside Dhaka.[7]

There is an inter-epidemic period of 4-8 years (sometimes as long as 20 years). Outbreaks are most likely to occur in post-monsoon period when the vector density is very high. There is no significant sex predilection and the virus causes illness in almost all age groups. The incubation period (time from infection to illness) can be 2-12 days, but is usually 3-7 days.[8]

Clinical presentations

Most patients infected with CHIKV develop acute symptoms, usually 2 to 6 days after the infective mosquito bites. The first symptoms start abruptly and last for about a week before spontaneous improvement. The acute stage is defined as the first 10 days after disease onset. The most frequent symptoms are high fever and arthralgia or arthritis affecting multiple joints,

Correspondence: Prof. Syed Shafi Ahmed Muaz, Professor & Head, Pediatric Gastroenterology, Hepatology & Nutrition, Bangladesh Institute of Child Health, Dhaka Shishu (Children) Hospital. E-mail: ahmedmuaz@yahoo.com

back pain, and rashes. Fever is usually high (usually 102°-105°F) and is poorly responsive to antipyretics. The acute bilateral and symmetrical rheumatism is typically extensive and progressive within a few days. Peripheral joints are frequently very painful and swollen, especially interphalangeal joints, wrists, and ankles. A transient petechial or maculopapular rash of the trunk and occasionally the limbs can also develop in half of the patients. Other nonspecific symptoms can include headache, nausea, vomiting, conjunctivitis, slight photophobia and anorexia. Ocular inflammation from chikungunya may present as iridocyclitis. Retinal lesions may also occur. Pedal edema is observed in many patients. Prodromal symptoms are rarely reported. After a week of intense discomfort, pain, and incapacity, most CHIKV infected patients experience a significant improvement of their condition. The fever drops, and the asthenia and joint pain become more acceptable. This period usually lasts for 1 to 2 weeks before a very common relapse.[3] It is difficult to distinguish chikungunya and dengue based on clinical findings alone. Both the viruses transmitted by the same mosquitoes. Chikungunya virus more likely to cause high fever, severe polyarthralgia, arthritis, rash, and lymphopenia. On the other side, Dengue virus more likely to cause neutropenia, thrombocytopenia, hemorrhage, shock, and death.[8]

Case Definition

Clinical criteria are acute onset of fever >38.5°C with severe arthralgia/arthritis not explained by other medical conditions. **Epidemiological criteria** are residing or having visited epidemic areas with having reported transmission within 15 days prior to the onset of symptoms. **Laboratory Criteria** are at least one of the following tests positive in the acute phase: Virus isolation by Cell Culture, presence of viral RNA by Real Time PCR (RT-PCR), presence of viral specific IgM antibody in single serum sample collected within 5 to 28 days of onset fever or four-fold Rise of IgG antibody in samples collected at least three weeks apart (1st sample after 7 days). **Possible case means** a patient meeting clinical criteria, **Probable case means** a patient meeting both the clinical and epidemiological criteria. **Confirmed case means** a patient meeting the laboratory criteria, irrespective of the clinical presentation.[8,9]

Laboratory & differential diagnosis

Routine investigation includes CBC (Leucopenia with lymphocyte predominance, thrombocytopenia rare), ESR (elevated) and CRP (elevated). The confirmation of Chikungunya fever is through any of the one: Isolation of virus, PCR, detection of IgM antibody or demonstration of rising titre of IgG antibody. IgM antibodies demonstrable by ELISA may appear within two weeks. It may not be advisable to do the antibody test in the first week. In some persons it may take six to twelve weeks for the IgM antibodies to appear in sufficient concentration to be picked up in ELISA. Chikungunya fever may not have the typical manifestations or it may co-exist with other infectious diseases like dengue fever or non infectious diseases like rheumatoid arthritis. Dengue fever, reactive arthritis, serum sickness illness, rickettshial disease, rheumatic fever, malaria and leptospirosis are considered as a differentials.[8,9,11]

Management

Patients with suspected Chikungunya should be managed as dengue until dengue has been ruled out. There is no specific antiviral drug treatment for Chikungunya. It is a self limiting disease, treatment is symptomatic and supportive. Treatment is directed primarily at relieving the symptoms; including the joint pain using paracetamol, NSAIDs such as naproxen and ensuring adequate fluid intake. Aspirin should be avoided due to its effect on platelets. Some clinicians have used hydroxychloroquine/chloroquine for treating the viral arthropathy of Chikungunya fever. Published evidence does not support the use of corticosteroids, antibiotics or antiviral drugs in the management of Chikungunya fever and indiscriminate use of these agents can be hazardous. Electrolyte imbalance, prerenal acute renal failure, bleeding manifestations should be watched carefully and managed accordingly.[3]

Prognosis, prevention & control

Acute symptoms typically resolve within 7-10 days. Some patients might have relapse of rheumatologic symptoms (e.g., polyarthralgia, polyarthritis, tenosynovitis) in months following acute illness. In variable proportions of patients, joint pain may persist for months to years.[8] There is no vaccine or specific medication available against Chikungunya infection. Vector control is thus very important in controlling or preventing Chikungunya transmission. Elimination of breeding sites or source reduction is an effective method of control. Aedes aegypti is typically a

container habitat species & breeds primarily in artificial container & receptacles. The best way is to encourage people to eliminate the mosquito habitats by emptying water containers once a week & keeping the permanent water containers covered with a tight fitting lid. Adoption of these methods can be encouraged through community based programmes. Legislation, strong public advocacy & community involvement can also help in vector control. Personal protection like long sleeve clothes, covering oneself fully, use of repellents, window nets play limited but useful role.[4]

Conclusions

The burden of Chikungunya virus infection is increasing day by day. This fever is highly symptomatic. The disease is self-limiting but a part of the patients suffers from a long-lasting arthritis similar to rheumatoid arthritis. The disease should be preventable and it would require a planned approach with increase awareness of people. Integrated vector management through the elimination of breeding sites, use of anti-adult and anti-larval measures and personal protection will contribute to preventing an outbreak.

References

1. Bhowmik D, Chiranjib, Kumar KPS. Chikungunya Epidemic in India- A Major Public Health Disaster. RJPBCS. 2010; 1: 63-73.
2. Hasan R, Rahmen M, Moniruzzaman M, Rahim A, Barua S, Biswas R et al. Chukungunya-an emereging infection in Bangladesh: a case series. J Med Case Reports. 2014; 8: 1-3.
3. Hoque S, Ahmed N. Chikungunya fever and Bangladesh: Review and updates. DS (Child) H J. 2012; 28: 115-22.
4. Chowdhury FI, Kabir A, Das A, Mukerrama SM, Masud S. Chikungunya fever: An emerging threat to Bangladesh. J Medicine. 2012; 13: 60-64.
5. Hasib NI. Chikungunya spreads in Dhaka. Published: 2014-04-30. Available at: http://bdnews24.com/health/2014/04/30.
6. Hasib NI. Chikungunya viral disease spreads fast in Dhaka. http://bdnews24.com/health/2017.
7. Mobarok F. Chikungunya spreading fast.Asian Age Online. Available at: http://dailyasianage.com/news/62036/chikungunya-spreading-first.
8. Disease control division, Directorate general of health services, Ministry of health & family welfare, Bangladesh. National guideline on clinical management of Chikungunya fever. 2017: 1-24.
9. World Health Organization. Regional office for South-East Asia. Guidelines on clinical management of Chikungunya fever. 2008; 1-26.
10. World Health Organization. Regional office for South-East Asia. Guidelines for prevention & control of Chikungunya fever. 2009; 1-28.
11. Directorate general of health services, Ministry of health & family welfare, Govt. of India. National guideline for clinical management of Chikungunya. 2016; 1-28.