ORIGINAL ARTICLE

Disaster in the making chikungunya epidemics in Karachi: A fight worth fighting

Muhammad Rasheed Khan Durrani, Iram Ashraf, Anam Shaikh

Received:
1st January 2017

Accepted:
13th October 2017

Abstract

Objective: The aim and objective of this study was to document a Chikungunya outbreak in the city of Karachi, Pakistan. Patients who presented to our ward (described below) during this outbreak were included in the study.

Setting: Medical Unit-II, Ward 6, Jinnah Postgraduate Medical Centre, Karachi. From 1st September, 2016 to 31st July, 2017.

Background: It has come to show that the people of Karachi, which is one of the largest metropolitan cities in the world, are facing out-breaks of Chikungunya virus. Chikungunya, a vector borne alpha virus infection, is not uncommon. It is a devastating disease which generally occurs as an outbreak and cripples a startlingly large number of patients, which has been discussed in detail in this study. Although self limiting, this disease has both short term and long term complications. However, mortality is found to be rare. Chikungunya is associated with epidemics and it is closely linked with dengue fever. Both of these viral infections have common geographical distribution, vectors and presentation. Outcome is also similar.

Result: A total of 78 patients were enrolled in this study according to their clinical presentation. All 78 patients classically presentend with fever (100%), 70 patients presented with polyarthralgias and fatigue (90%),70 patients primarily complained of headache (90%), 43 patients presented with a pruritic rash, while 42 patients presented with only nausea and vomiting (54%). 14(17.9%) patients were admitted in Medical Unit II, Ward 6, JPMC, and showed significant improvement within 4 to 5 days. There was no mortality.

Conclusion: With the help of this study, we have documented an out break which appears to be a developing epidemic and, if studied further in depth, may prove to be just the tip of the iceberg, impending threat

Keywords: Chikungunya, dengue fever, polyarthralgias and fatigue, headache, pruritic rash, mosquito Aedes Aegpti

Jinnah Post Graduate Medical Centre, Karachi
MR Durrani
I Ashraf
A Shaikh

Correspondence:
Dr M Raasheed Durrani, Associate Professor, Department of Medicne, Medical Unit-II, Jinnah Post Graduate Medical Centre, Karachi
Cell: + 92-
Email: drrasheeddurrani@gmail.com

Introduction:

Chikungunya is a viral disease caused by the bite of the mosquito Aedes Aegpti (or sometimes aedes albopictus).[1] The same mosquito also causes the spread of yellow fever, dengue fever and Zika Chikungunya fever (CHIK).[2] Chikungunya virus (CHIKV) is a double stranded RNA alpha virus, belonging to the family to gaviridae and spreads by the bite of feeding female Aedes mosquito. Patients classically present with fever and severe joint pain.[3] Other features include headache, severe muscular pain, and nausea, vomiting and in capacitating fatigue. Skin rash is not uncommon. The presentation closely mimics that of dengue fever but, here complaints are mostly restricted to joints, especially small joints which are unusual for dengue fever. Both infections are common in the same geographical locations.[4] Upton 66.5% cases are seem to present for more than 1 years in Italy but in our part of world it 4-25% at 1 years time.

The virus exists in three forms, mostly restricted to Sub-Saharan Africa, South East Asia and the

Pacific respectively. All three forms are responsible for huge epidemics in their respective areas. There is, however, considerable variability regarding transmission, presentation and mortality.[5] Recently, the African type Chikungunya virus has been reported in South East Asia. This type is reported to be the most resistant as well as virulent, and this can also be transmitted through sylvatic mode.[6] The incidence of Chikungunya virus is high in pregnant ladies and there is vertical transmission if mother having uremia at the time of delivery. These child are provoke for neuro-cognitive disorders.[7]

It is known that dengue fever has caused havoc in Pakistan in recent years but now a new threat of Chikungunya is in the works.[7] Several theories have surmised that the gradual climate change in the form of milder winters and more brutal summers contributed to this threat. Such climate change has shown to increase the frequency of vector associated viral infections. This is all happening under milieu of over crowding, illiteracy and very poor sanitary condition.[8] It will not be incorrect to state that the aedes mosquito finds the climate shift, rapidly expanding populationn, unplanned urbanization and devastating sanitary conditions prevalent in many parts of Pakistan, ideal for its survival.

To investigate this disease in suspected patients, Chikungunya virus reverse transcriptase (RT)-PCR assay is done within the initial days following onset of symptom. This is because CHIKV RNA is detected only during the acute phase of illness (≤8 days after onset of symptoms). Viral DNA is usually undetectable a week after onset of symptoms. Thus, this test is not of much use later. The laboratory tests generally act by detecting serum or plasma virus, viral nucleic acid or virus related specific antibody test IgM or neutralizing antibody.[9] They generally take 7-10 days to give results and require great technical expertise, which is mostly not available. However, diagnosis based solely on these tests is not commonly practiced. The reason being that such tests are available in very few laboratories while number of patients is very large. In addition, extreme precautions and standardised safety measures are needed for laboratory personnel as laboratory related accidents and spreads are not uncommon. Serological diagnosis of Chikungunya is done by detection of anti-chikungunya antibodies (IgM and IgG) by using enzyme linked immunosorbent assay (ELISA). This test is so far the most reliable investigation currently available because these IgM antibodies peak between 3-5 weeks after the disease onset and remain active almost for two months.[10]

Unfortunately, there is yet no cure, specific treatment or licensed vaccination for the disease.[11] Treatment is mainly focused toward relieving symptoms which have a waxing and waning character. There are gross differences in conservative management of CHIK and dengue fever, for example, the use of different non steroidal anti-inflammatory drugs (NSAIDS) is possible in Chikungunya whereas in dengue fever only acetaminophen can be used. No licensed vaccine is available yet, but once disease occurs there is no relapse and interestingly enough, a single infection incurs life time immunity. The only prophylaxis is avoidness of vectors. It is not uncommon to find patients suffering from Chikungunya descent to chronic pain and depression there is recent enthusiasm about chloroquine role in chronic arthragia associated with Chikungunyag Virus.[12]

Although unlikely to be associated with mortality, high risk patients such as the aged, or patients with co-morbid like hypertension, diabetes mellitus or ischemic heart disease (IHD) especially tend to have severe presentation.[13]

Karachi is located in the belt of Arabian Sea.[14] The largest tertiary care hospital in the city, JPMC, was burdened with a constant flow of Chikungunya patients before, during and after this study. All patients underwent IgM serological testing. Most patients were treated as outpatients. Our study only included patient aged 16 years or above who presented with acute Chikungunya infection. These patients fulfilled the criteria for fever with or without active infection, poly-arthralagia with active infection including a minimum of 5 days history.

Table-1: Demographic clinical data in the patients (n=78)

Mean Age	46.2 years	70%
Male / Female	46/31 (ratio: 3/2)	24%
Reporting Time	1.8 days	04%
Acute phase settles	5 days	02%
Chronicity > 3 weeks of presentation	15 (20%)	
Relapse of signs & symptoms	8 (11%)	
Mortality	Nil	
Co morbid:		
Hypertension	20	25.6%
Diabetes mellitus	15	19.2%
COPD	5	6.4%
Ischemic heart disease	4	5.12%
Chronic renal failure	1	1.2%

Table-2: Presentation of Chikungunya fever in this study (n=78)

No.	Signs & Symptoms	No. of Patient	Percentage
1	Fever	78	100%
2	Fatigue	74	95%
3	Arthralgia	70	90%
4	Buccal ulcer	65	84%
5	Rash	43	56%
6	G.I. Symptoms: Nausea, vomiting, abdominal pain	42	54%

Table-3: Pattern of joint involvement

Ankle	65	84%
Knee	49	63%
Wrist	40	52%
Small joints of hand	26	34%

**This is predominant involvement; otherwise patients have generalized joint pain, with involvement of both small and large joints along with axial joints.*

There have been official reports positive of more than 1,000 patients with Chikungunya Virus (CV) infection in Karachi between December, 2016 and April, 2017 (National Health Services, Pakistan Ministry of National Health Services). According to another estimate, there have been more than 30,000 patients of Chikungunya Virus in Karachi. No CHIKV associated death has been reported so far.[15]

As discussed above, the factors contributing for this developing epidemic are increasingly warm and prolonged summers and delayed winters, poor sanitation with open sewage and collection of stagnant water. Over-crowding adds to the problem. This situation is ideal to the breeding and spread of mosquitos. In Karachi, the most affected areas were found to be Ibrahim Hyderi, Keamari, Malir and Lyari.[16]

Material and Methods:

Patient's aged16 years and above were recruited based on signs and symptoms during the days of the out break. Serological tests were done in all patients and reports were chased within a few days. Both in patients and outpatients were enrolled in this study. All demographic data was collected at admission and in out patient department.

Patients who were found to be positive for Plasmodium species and Dengue were not included in this study.

Result:

The most common presentation was found to be fever (100%), poly-arthralgias and fatigue (90%). Other symptoms included nausea and vomiting (54%), rash and headache (90%).

Patients were treated with Acetaminophen, Ibuprofen and Froben in oral formulations. Diclofenac, Disprin and corticosteroid were generally avoided.

The mean age of patients was found to be 46.2 years (table-1). Older patients and those with co-morbids were found to be more susceptible to this illness and also presented with severe disease. Hypertension was seen in a total of 20 patients (25.6%), diabetes mellitus in 15 patients (19.2%), IHD in 4 patients (5.1%), Chronic Obstructive Pulmonary Disease (COPD) in 5 patients (6.4%) and Chronic Renal Failure (CRF) was present in 1 patient (1.2%) out of a total of 78 patients. (table-1). These patients had rare severe disease and were admitted in the ward for treatment.

Poly-arthralgias tended to involve mostly the ankle (65, 84%) while 49 patients had knee involvement (63%), 40 patients had wrist involvement (52%) and 26 patients were found to have

small joints of the hand involvement (34%). However, almost every joint in the body was involved. The details are shown in table-2.

Discussion:

Chikungunya virus is traditionally known for abrupt onset of high fever associated with severe weakness, poly-arthralgias involving small and large joints of the body. It is such a crippling disease that it restricts activities, and patients may be literally confined to bed.[15]

This is basically a clinical presentation based study which clearly reveals that Chikungunya classically presents with high grade fever and lethargy. It is mostly seen in elderly and most patients with severe disease, are those who are suffering from comorbids like hypertension, diabetes, Ischemic heart disease, COPD etc. such patients constitute the bulk of suffering in affected patients.[16]

The pain is usually so severe that most patients have been reported to call it 'the worst pain of their life'.[17] Chikungunya closely mimics Dengue fever in several aspects but generally joint pain in isolation is never a feature of dengue fever.[18]

Frequency of skin rash is over 50%.[19] It mainly involves the upper torso, is photo-sensitive and very pruritic. It generally occurs during the first few days of disease. In this study we observed a rash in 43% of cases, which is in accordance with contemporary studies.[20]

Gastrointestinal sign and symptoms like abdominal pain, vomiting etc are also not uncommon.[21]

Conclusion:

We conclude that we have documented an out break which appears to be a developing epidemic and, if studied further in depth, may prove to be just the tip of the iceberg, impending threat.

In a country like Pakistan we need to prepare ourself to fight against the our break of chikungunya virus.

Conflict of interest: None

Funding source: None

Role and contribution of authors:

Dr. M. Rasheed Durrani, concept, data collection, and main writing

Dr. Iram Ashraf, Data interpretation, review of article

Dr. Anam Shaikh, critique review

References:

1. Rajapakse, S,Rodrigo C, Rajapakse et al. Atypical manifestations of chikungunya infection. Trans R Soc Trop Med Hyg. 2010; 104: 89-96.
2. Ross RW. The Newala epidemic: III. The virus: isolation, pathogenic properties and relationship to the epidemic. J Hyg (Lond) 1956; 54(2):177–91.
3. Kennedy AC, Fleming J, Solomon L. Chikungunya viral arthropathy: a clinical description. The Journal of rheumatology. 1979 Dec; 7(2):231-6.
4. Lee MS, Hwang KP, Chen TC et al. Clinical characteristics of dengue and dengue hemorrhagic fever in a medical center of southern Taiwan during the 2002 epidemic. Journal of microbiology, immunology, and infection= Wei mianyu gan ran zazhi. 2006 Apr; 39(2):121-9.
5. Brighton SW, Prozesky OW, De La Harpe AL. Chikungunya virus infection. A retrospective study of 107 cases. South African medical journal= Suid-Afrikaansetydskrifvirgeneeskunde. 1983 Feb; 63(9):313-5.
6. Thaikruea L, Charoensook O, ReanphumkamkitS, et al. Chikungunya in Thailand: a re-emerging disease? Southeast Asian Journal of Tropical Medicine and Public Health. 1997 Jun 1; 28:359-64.
7. Gérardin P, Sampériz S, Ramful D etal. Neurocognitive outcome of children exposed to perinatal mother-to-child Chikungunya virus infection: the CHIMERE cohort study on Reunion Island. PLoS neglected tropical diseases. 2014 Jul 17;8(7):e2996.
8. Raff M, Manzoor S, Mehmood A et al. Outbreak of chikungunya in Pakistan. The Lancet Infectious Diseases. 2017 Mar 1; 17(3):258.
9. Ross RW. The Newalla epidemic: III. The virus: isolation, pathogenic properties and relationship to the epidemic. J Hyg (Lond) 1956; 54(2):177–91.
10. De Carli G, Abiteboul D, Puro V et al . The importance of implementing safe sharps practices in the laboratory setting in Europe. Biochemiamedica. 2014 Feb 15; 24(1):45-56.
11. Haroon MZ, Wazir MS. and yet one more adds to the sorrow. Journal of Ayub Medical College Abbottabad. 2016 Dec 1; 28(4):637-8.
12. Javelle E, Ribera A, Degasne I et al Specific management of post-chikungunya rheumatic disorders: a retrospective study of 159 cases in Reunion Island from 2006-2012. PLoS neglected tropical diseases. 2015 Mar 11; 9(3):e0003603.
13. Hoke CH, Pace-Templeton J, Pittman P et al. US Military contributions to the global response to pandemic chikungunya. Vaccine. 2012 Oct 19;30(47):6713-2
14. Kariuki Njenga M, Nderitu L, Ledermann JP et al. Tracking epidemic Chikungunya virus into the Indian Ocean from East

Africa. J GenVirol 2008; 89(11):2754–60.
15. Rahman, A, Lee, H, and Khan, MA. Domestic water contamination in rapidly growing megacities of Asia: case of Karachi, Pakistan. EnviornMonit Assess. 1997; 44: 339-360.
16. Naqvi S, Bashir S, Rupareliya C et al. Clinical Spectrum of Chikungunya in Pakistan. Cureus. 2017 Jul 6; 9(7).
17. Paul, BJ, Pannarkady, G, Mori, SP et al. Clinical profile and long term sequelae of chikungynya fever. Indian J Rheumatol 2011; 6: 12-9.
18. Lee MS, Hwang KP, Chen TC, et al Clinical characteristics of dengue and dengue hemorrhagic fever in a medical center of southern Taiwan during the 2002 epidemic. Journal of microbiology, immunology, and infection= Wei mianyu gan ran zazhi. 2006 Apr;39(2):121-9
19. Aamir UB, Badar N, Salman M et al. Outbreaks of chikungunya in Pakistan. The Lancet Infectious Diseases. 2017 May 1; 17(5):483.
20. Nek NS, Joshi N, Shergill GS et al. Acute Chikungunya Fever Presenting as Migratory Polyarthritis. Health Sciences. 2017 Jan 1; 6(1):66-70.
21. Handler MZ, Handler NS, Stephany MP et al. Chikungunya fever: an et al emerging viral infection threatening North America and Europe. International journal of dermatology. 2017 Feb 1; 56(2).
22. Epstein PR. Chikungunya fever resurgence and global warming. The American journal of tropical medicine and hygiene. 2007 Mar 1;76(3):403-4.