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CLINICAL PROFILE AND INCIDENCE OF CHIKUNGUNYA IN PATIENTS OF ACUTE FEBRILE ILLNESS

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ABSTRACT

Background: Chikungunya is a major mosquito-borne viral illness in tropical countries, frequently presenting as acute febrile illness (AFI). Its severely debilitating musculoskeletal effects, poses a diagnostic and public health challenge. **Objective:** To study the clinical profile and incidence of chikungunya infection in patients presenting with acute febrile illness at a tertiary care hospital. **Methods:** A prospective observational study was conducted in patients admitted with AFI at a tertiary care teaching hospital. Serum samples were tested for Chikungunya-IgM antibodies using ELISA as per National Vector Borne Disease Control Programme (NVBDCP) guidelines and clinical and laboratory parameters were evaluated. **Results:** Of 1203 AFI patients, 51 (4.24%) tested Chikungunya-positive. Cases were nearly evenly distributed between males (25) and females (26). The 21–30-year age group accounted for the highest number of cases in both genders, with a marked decline in older age groups. Approximately 82% of cases occurred between August and November, peaking in September. The most common symptoms were fever (41%), headache/body ache (30%), myalgia/arthralgia (27 cases), and gastrointestinal symptoms. Retro-orbital pain was rare (2%). Mean values included Hb 11.8 g/dL, TLC 4.6×10^9/L, platelets 145×10^9/L, with variable elevations in liver enzymes and serum potassium. No comorbid conditions were observed in 68.6% patients. DM (11.8%), DM+HTN (11.8%), and HTN (7.8%) were among the main associated conditions. **Conclusion:** Chikungunya remains an important cause of AFI in endemic areas, with clinical presentations potentially influenced by comorbid or concurrent arboviral infections. Early recognition, enhanced diagnostic capacity, and tailored monitoring strategies are essential to improve outcomes in chikungunya-affected populations.

KEYWORDS : Chikungunya, Acute Febrile Illness, Aedes, Vector-borne disease

INTRODUCTION

Chikungunya fever is a mosquito-borne viral illness caused by the *Chikungunya virus* (CHIKV), an Alphavirus first isolated in Tanzania in 1953. The name, meaning "bent walker" in Swahili, reflects the stooped posture resulting from severe arthralgia, the hallmark of this generally non-fatal but debilitating disease.

Globally, chikungunya causes explosive outbreaks followed by long periods of quiescence. First identified in East Africa in 1952, the virus re-emerged in the Democratic Republic of Congo in 1999–2000 and spread widely after the emergence of the Indian Ocean Lineage (IOL) in 2004. Subsequent epidemics occurred across the Indian Ocean islands, South and Southeast Asia, Europe, and the Americas, including a major Caribbean outbreak in 2013. Transmission continues intermittently in Asia, Africa, and the Americas.

In India, CHIKV was first isolated in 1963, with frequent outbreaks in the 1960s and a major resurgence in 2006. In 2022, over 148,000 suspected cases were reported nationwide. Maharashtra remains a high-burden state, with Mumbai showing increased susceptibility due to dense population, urbanization, inadequate water storage, and environmental factors. Nationally, chikungunya follows a seasonal trend, peaking during the post-monsoon months (July–November).

CHIKV spreads through a human–mosquito–human cycle involving *Aedes aegypti* and *Aedes albopictus*, which breed in clean stagnant water and proliferate in warm, humid, post-monsoon conditions. After transmission, CHIKV infects musculoskeletal tissues and induces strong inflammatory responses involving monocytes, macrophages, NK cells, and T cells. While many patients recover, some develop chronic arthralgia due to persistent inflammation.

This study aimed to assess the clinical profile and incidence of chikungunya infection in hospitalized patients presenting with acute febrile illness at a tertiary care center

MATERIAL AND METHODS

Study Design And Setting

A prospective observational study was conducted in the Department of Microbiology in collaboration with the Departments of Medicine and Pediatrics at a tertiary care teaching hospital in Mumbai over 18-months period after IEC approval (IEC/PG/879/Sep/2022).

Study Population

Patients aged ≥5 years presenting with acute febrile illness (fever ≤7 days) were included. Exclusion criteria included patients with microbiologically confirmed infections (e.g., malaria, typhoid) or chronic comorbid conditions known to cause fever.

Sample Collection And Testing

Blood samples were collected under aseptic precautions. Serum was separated and tested for IgM antibodies using ELISA kits supplied by NIV, Pune as per NVBDCP guidelines. In-house retained positive samples were used as internal controls along with negative and positive controls supplied with the kits.

Data Collection

Demographic data, clinical features, and laboratory parameters (hematocrit, platelet count, liver and renal function tests) were recorded after taking written informed consent.

Statistical Analysis

Data was analyzed using descriptive statistics in Microsoft Excel. Continuous variables were expressed as mean ± SD, and categorical variables as percentages.

RESULTS

Incidence Of Chikungunya

Out of 1203 patients presenting with acute febrile illness (AFI) during the study period, 51 (4.24%) were confirmed to have chikungunya infection by IgM antibody ELISA.

Demographic Distribution

Table 1: Age And Gender Profile

Chikungunya		
Age Group	**Gender**	
	Male	**Female**
0-6	1	4
7-12	2	1
13-20	1	0
21-30	7	8
31-40	3	4
41-50	3	5
51-60	3	2
61-70	5	1
>70	1	0
Total (N=51)	25	26

Table 1 displays the distribution of Chikungunya patients by age group and gender. Among males, the highest number of cases occurs in the 21-30 age group (7 cases), followed by the 31-40 and 41-50 age groups with 3 cases each. In females, the largest number of cases is also in the 21-30 age group (8 cases), followed by the 41-50 age group with 5 cases. Notably, there are fewer cases in older age groups, with only 1 case each in the 61-70 age group for males and females, and no cases reported in the >70 age group for females. Overall, there are slightly more female cases (26) than male cases (25), indicating a relatively balanced distribution by gender.

Seasonal Distribution:

Most cases (approximately 82%) were recorded between August and November, coinciding with the monsoon and immediate post-monsoon period when vector breeding peaks. A sharp rise in incidence was noted in September, followed by a gradual decline after November.

Clinical Profile

Table 1: Clinical Manifestations In Chikungunya (n=51)

Chikungunya	
Clinical Symptoms	**Frequency**
Fever	41
Restlessness	20
Sore throat	26
Abdominal pain	26
Diarrhoea	27
Anorexia	25
Nausea/Vomiting	28
Rashes	25
Myalgia/Arthralgia	27
Retroorbital pain	2
Headache/Bodyache	30

Table 1 depicts the clinical symptoms and their respective frequencies associated with Chikungunya. Fever is the most prevalent symptom, occurring in 41% of cases, followed by headache/ body ache at 30%. Retroorbital pain is the least common symptom, reported in only 2% of cases. Overall, Chikungunya symptoms exhibit a lower frequency compared to dengue, with fever and headache/body ache being the most notable symptoms.

Laboratory Parameters

Table 2: Descriptive Statistics For Laboratory Parameters In Chikungunya (n=51)

Chikungunya-IgM											
Descriptives	**Hb**	**TLC**	**PLT**	**PCV**	**Urea**	**Creat**	**SGOT**	**SGPT**	**ALP**	**Na**	**K**
N	51	51	51	51	51	51	51	51	51	51	51
Mean	11.8	4.61	145	44.7	7.65	0.973	141	200	99.6	131	5.35
Standard deviation	1.1	1.2	36	5.11	6.57	0.1	49.5	80.7	31.7	2.91	1.15
Median	12	4	146	46	5	1	145	199	97	130	5
25th percentile	11	4	126	44	4	1	104	140	73.5	128	4.5
75th percentile	13	6	171	48	6	1	182	269	115	133	6
Minimum	9	2	72	31	4	0.7	41	61	58	127	3
Maximum	14	6	202	50	28	1.1	232	333	194	139	7

Table 2 outlines descriptive statistics for various blood parameters in 51 patients testing C-IgM positive. It reveals significant variations across parameters, such as Hemoglobin levels averaging at 11.8 g/dL with a standard deviation of 1.1 g/dL, while Platelet Count averages 145 x10^9/L with a wider spread indicated by a standard deviation of 36 x10^9/L. Notably, Serum Potassium levels show a mean of 5.35 mmol/L with a relatively high standard deviation of 1.15 mmol/L, suggesting considerable variability in this parameter among C-IgM positive patients. These statistics provide valuable insights into the physiological profiles of individuals with C-IgM positivity, aiding in clinical assessments and treatment strategies.

Non-communicable Diseases

Table 3: Association With NCD (n=51)

Chikungunya		
Medical History	**Number Of Cases**	**% of Total**
DM	6	11.8 %
DM+HTN	6	11.8 %
HTN	4	7.8 %
None	35	68.6 %
Total	51	100%

Table 3 illustrates the medical history of 51 Chikungunya positive individuals. Medical conditions include Diabetes Mellitus (DM), a combination of Diabetes Mellitus and Hypertension (DM+HTN), Hypertension (HTN), and None. The majority of individuals have no reported NCD (68.6%). However, Diabetes Mellitus and a combination of Diabetes Mellitus and Hypertension are both present in 11.8% of cases. Additionally, Hypertension alone is reported in 7.8% of cases.

DISCUSSION

The demographic distribution of Chikungunya in our study reveals a balanced gender distribution, which is consistent with previous studies showing it often affects younger adults, likely due to higher exposure rates through outdoor activities and occupational hazards. A study by Mourad O et al. (2022) found that Chikungunya outbreaks tend to have a higher impact on young adults, who are more active and have increased chances of mosquito contact [1]. The relatively even gender distribution in our study contrasts with some studies that have reported a higher incidence of Chikungunya in females, which is often attributed to increased indoor exposure to mosquito vectors. However, the slight female predominance observed here aligns with findings from studies by Halstead SB (2015), which suggested that while males are more likely to be exposed due to outdoor activities, females may be more susceptible to infection due to prolonged indoor exposure where Aedes aegypti is prevalent [2].

The symptomatic profile of Chikungunya patients in our study highlights fever as the most prevalent symptom, occurring in 41% of cases, which is consistent with existing literature that identifies fever as a hallmark of Chikungunya infection. According to Weaver SC et al. (2015), fever is almost universally present in Chikungunya patients, often accompanied by a sudden onset and high temperature [3]. Headache and body ache, occurring in 30% of cases, are also well-documented in literature as being highly characteristic of

Chikungunya, often described as severe and debilitating. Suhrbier et al. (2012) noted that myalgia and arthralgia, in particular, are not only common but can persist for months or even years after the acute phase of the infection, significantly impacting the quality of life [4]. Retroorbital pain, the least common symptom in our study, was reported in only 2% of cases. This is relatively uncommon in Chikungunya compared to other arboviral infections like dengue, where retroorbital pain is more frequent. This observation is supported by Simon F et al. (2007), who found that while retroorbital pain is a typical symptom of dengue, it is less common in Chikungunya [5]. The low frequency of retroorbital pain in our cohort aligns with this distinction between the two diseases.

Gastrointestinal symptoms, including nausea/vomiting (28%), diarrhea (27%), and abdominal pain (26%), were also relatively common among the Chikungunya patients in our study. These symptoms are consistent with findings by Soumahoro MK et al. (2009), who reported that gastrointestinal disturbances are frequently observed in the acute phase of Chikungunya infection [6]. The presence of these symptoms highlights the systemic nature of CHIKV and its ability to affect multiple organ systems. Rashes were reported in 25% of cases, which is a typical manifestation of Chikungunya. According to Pialoux G et al. (2007), skin rashes are a common feature of the disease, often appearing alongside fever and joint pain [7].

The laboratory parameters in Chikungunya patients provide important insights into the hematological and biochemical changes. The mean hemoglobin level of 11.8g/dL, with SD of 1.1g/dL, suggests mild anemia, which is a common finding in Chikungunya patients. This is consistent with studies by Kelvin AA et al. (2011), which reported that Chikungunya infection can lead to mild anemia due to hemoconcentration and occasional hemolysis [8]. The mean platelet counts of 145x10 ^ 9/L, with a wide range indicated by SD of 36x10 ^ 9/L, reflects thrombocytopenia is frequently observed in Chikungunya infections. This is in line with research by Chow A et al. (2011), who noted that thrombocytopenia is a characteristic feature of Chikungunya, though generally less severe than in dengue fever [9]. Serum creatinine levels in our study averaged 0.973mg/dL, indicating that most patients maintained normal renal function. This is consistent with the typical clinical course of Chikungunya, which rarely involves significant renal impairment. However, in severe cases, especially those with dehydration or comorbid conditions, renal dysfunction can occur, as noted in studies by Economopoulou A et al. (2009), who highlighted that while renal involvement in Chikungunya is rare, it can be a complication in severe cases [10]. The mean serum potassium level of 5.35mmol/L, with a relatively high SD of 1.15mmol/L, suggests that there is considerable variability in potassium levels among Chikungunya patients. This finding is particularly important as electrolyte imbalances, including hyperkalemia, can occur, particularly in patients with severe disease or those with comorbidities. This is supported by studies by Mardekian and Roberts (2015), who emphasized the need for careful monitoring of electrolytes in patients with Chikungunya [11].

In terms of medical history, the majority of Chikungunya patients in our study (68.6%) reported no pre-existing medical conditions, which suggests that Chikungunya can significantly impact otherwise healthy individuals. However, the presence of DM and a combination of DM+HTN in 11.8% of the cohort indicates that these non-communicable diseases are an incidental finding, with increased severity among Chikungunya patients. This aligns with previous research that highlights the role of comorbid conditions in exacerbating the severity of Chikungunya. According to Suhrbier A et al. (2012), patients with chronic conditions like diabetes are more likely to experience severe symptoms and prolonged joint pain post-infection [4].

CONCLUSION

This study presents a prospective observational analysis conducted at a tertiary care hospital to determine the incidence and clinical profile of chikungunya infection among patients admitted with AFI. Of the 1203 AFI cases evaluated, the incidence of chikungunya was 4.24%, reflecting a moderate yet significant burden consistent with regional epidemiological trends in India.

Clinical assessment showed that patients with chikungunya frequently presented with high-grade fever and severe arthralgia, consistent with the classical manifestations of Chikungunya. They demonstrated certain laboratory abnormalities, including lower hemoglobin and significant thrombocytopenia, and co-morbidities were usually not associated.

Chikungunya remains an important cause of AFI in endemic regions and its clinical presentation may vary depending on the presence of underlying comorbidities or concurrent arboviral infections. This study underscores the need for early recognition of chikungunya in hospitalized AFI patients. Strengthening diagnostic capacity and adopting tailored monitoring strategies are essential for improving outcomes in chikungunya-affected populations.

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