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Chikungunya Fever in Dhaka, Bangladesh: Seroepidemiology and Clinical Presentation

Nasima Yasmin[1], A. K. M Rezwan[2], Abu Naser Md. Rasal[3], Tareq Md. Shahriar[4], Md. Feroz Miah[5], Wazed Hossen Jim[6]

[1]Associate Professor, Gonoshasthaya Samaj Vittik College of Physiotherapy & Health Science. Savar, Dhaka, Bangladesh.
[2]Assistant Professor, Gonoshasthaya Samaj Vittik College of Physiotherapy & Health Science. Savar, Dhaka, Bangladesh.
[3]Lecturer, Gonoshasthaya Samaj Vittik College of Physiotherapy & Health Science. Savar, Dhaka, Bangladesh.
[4]Assistant Professor, Gonoshasthaya Samaj Vittik College of Physiotherapy & Health Science. Savar, Dhaka, Bangladesh.
[5]Lecturer & Intern Coordinator, Gonoshasthaya Samaj Vittik College of Physiotherapy & Health Science, Savar, Dhaka, BD.
[6]Clinical Physiotherapist, Global Physiotherapy Canter. Savar, Dhaka, Bangladesh.
Corresponding Author: Dr. A. K. M Rezwan. PhD
Email: drreza85@gmail.com

Abstract:

Background: The Chikungunya virus (CHIKV) is the cause of Chikungunya fever, a virus spread by mosquitoes mostly Aedes aegypti and Aedes albopictus. Bangladesh's capital, Dhaka, has had repeated epidemics.
Objective: To assess the clinical manifestation and seroepidemiology of chikungunya fever in Dhaka's urban area.
Methods: A cross-sectional study was carried out between June and September 2025 on 340 patients who had a confirmed or suspected chikungunya infection. Serological profiles (IgM/IgG ELISA), clinical characteristics, and demographic data were gathered and examined.
Results: The mean age of the 340 patients was 34.7 ± 12.4 years, with 198 (58.2%) being female. The most common symptoms were fever (100%), multiarthralgia (92%), headache (67%), rash (48%), and myalgia (44%). IgM was 68% positive, and IgG was 22%. Eighteen percent of patients reported having persistent arthralgia. In late July and early August of 2025, the pandemic curve reached its peak.
Conclusion: Chikungunya fever exhibits distinctive clinical characteristics and a significant seroprevalence in Dhaka city. To effectively manage outbreaks, increased surveillance, vector control, and clinician knowledge are crucial.

Keywords: *Chikungunya, seroepidemiology, clinical features, Dhaka, Bangladesh, arboviral infection.*

INTRODUCTION

Aedes aegypti and Aedes albopictus mosquitoes are the vectors of the Chikungunya virus (CHIKV), an arthropod-borne alphavirus belonging to the Togaviridae family (Rodriguez et al., 2023). CHIKV has caused numerous epidemics in Africa, Asia, and the Americas since it was first discovered in Tanzania in 1952 (Russo et al., 2020). Globalization, fast urbanization, and climate change have all contributed to its spread by affecting the distribution and habitat of mosquitoes (Abbasi, 2025).

Due to high population density, inadequate vector management, and post-monsoon mosquito reproduction, Dhaka city was especially impacted by the major outbreaks that took place in Bangladesh in 2008, 2011, and 2017 (Mahmud et al., 2021). Although underreporting and misdiagnosis with dengue continue to be major concerns, serological evidence indicates widespread exposure in recent years (Rob et al., 2024).

Chikungunya usually manifests clinically as a sudden, high fever, headache, myalgia, rash, and severe polyarthralgia. Joint discomfort can last for months, sometimes resulting in chronic impairment, even though acute disease typically goes away in 1-2 weeks (Goupil & Mores, 2016). Complications are more likely to occur in elderly and comorbid patients (Couderc & Lecuit, 2015).

Accurate diagnosis is crucial for clinical management and epidemic response because of the symptoms' overlap with those of dengue and other arboviruses (Polanía-Espinosa et al., 2025). In order

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to offer current insights for disease control and prevention, this study examines the seroepidemiology and clinical characteristics of chikungunya in 340 patients in Dhaka city between June and September 2025.

MATERIALS & METHODS

Study Design and Setting: A cross-sectional study was conducted in Dhaka between June and September 2025, encompassing three tertiary hospitals under Gonoshasthaya Kendra.

Sample Size: Acute fever and polyarthralgia are found in 340 individuals.

Inclusion Criteria: Patients who are at least 18 years old, have a confirmed or suspected CHIKV infection, and have polyarthralgia and an acute fever (≥38°C).

Exclusion Criteria: patients with persistent arthritis, bacterial infections, dengue, or malaria.

Data Collection: Structured questionnaires were used to gather clinical data, and IgM/IgG ELISA was used for laboratory confirmation (CDC, 2022). SPSS v26 was used to analyze clinical, serological, and demographic data.

STATISTICAL ANALYSIS & INTERPRETATION

Table-1: Distribution of the respondent according to Demographic Characteristics (n = 340).

Variable	Category	Frequency	Percentage
Age group	<20	42	12.4
	21–40	210	61.8
	41–60	68	20.0
	>60	20	5.8
Sex	Male	142	41.8
	Female	198	58.2
Residence	Urban	196	57.6
	Semi-urban	144	42.4

The study involved 340 individuals in all. According to the age distribution, the majority of people (61.8%, n=210) were between the ages of 21 and 40, followed by those between the ages of 41 and 60 (20.0%, n=68). Participants under the age of 20 made up 12.4% (n=42), while the least number of participants were over 60 (5.8%, n=20). In terms of the distribution of sexes, women made up a larger percentage (58.2%, n=198) than men (41.8%, n=142). Regarding housing, the majority of participants lived in urban (central Dhaka) areas (57.6%, n=196), with the remaining participants (42.4%, n=144) residing in semi-urban (peripheral Dhaka) areas.

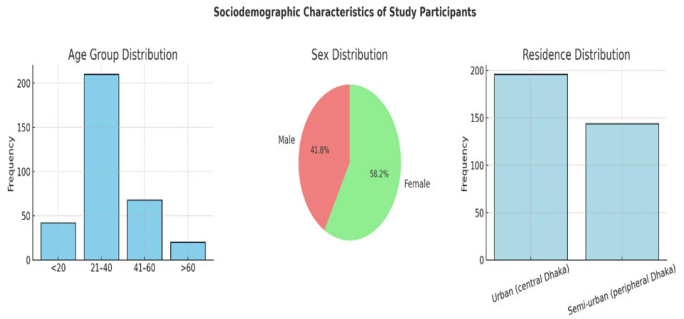

Figure 1: Demographic Characteristics of Patients

Table 2. Distribution of the respondent according to Clinical Features (n=340)

Symptom	Frequency (n)	Percentage (%)
Fever	340	100
Polyarthralgia	312	91.8
Headache	228	67.0
Rash	163	47.9
Myalgia	150	44.1
Fatigue	133	39.1
Nausea/vomiting	71	20.9
Conjunctivitis	28	8.2

The most common symptom seen in the study was fever, which was present in all patients (100%, n=340). With 91.8% (n=312) of patients reporting polyarthralgia, it was the second most common symptom, underscoring the typical joint involvement of chikungunya infection. 67.0% (n=228) reported having a headache, whilst 47.9% (n=163) and 44.1% (n=150) reported having a rash and myalgia, respectively. Additional prevalent symptoms included nausea/vomiting (20.9%, n=71) and exhaustion (39.1%, n=133). With 8.2% (n=28) of patients experiencing it, conjunctivitis was a less common symptom. These results suggest that ocular involvement was uncommon, cutaneous and gastrointestinal symptoms were also very prevalent, and fever and polyarthralgia were ubiquitous and distinguishing features.

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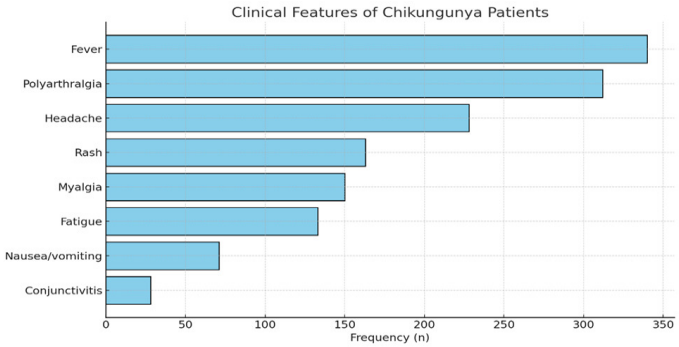

Figure- 2. Clinical Features of Chikungunya Patients

Table 3. Distribution of respondent according to Joint Involvement (n = 312)

Joint Involved	Frequency (n)	Percentage
Wrist	182	58.3
Ankle	175	56.1
Knee	152	48.7
Shoulder	97	31.1
Elbow	84	26.9
Small joints of hand	68	21.8

The wrist (58.3%, n=182) and ankle (56.1%, n=175) were the most frequently afflicted joints among the 312 patients who reported having arthralgia. Additionally, knee joints were commonly affected; 48.7% (n=152) of patients reported pain. Compared to lower limb joints, upper limb involvement was less noticeable: elbow joints were impacted in 26.9% of cases (n=84) and shoulder joints in 31.1% of cases (n=97). With a frequency of 21.8% (n=68), the hand's tiny joints were the least affected. Overall, chikungunya arthritis impacted both proximal joints (shoulder, elbow) and big peripheral joints (knee, ankle, and wrist), which is consistent with the polyarticular character of the condition.

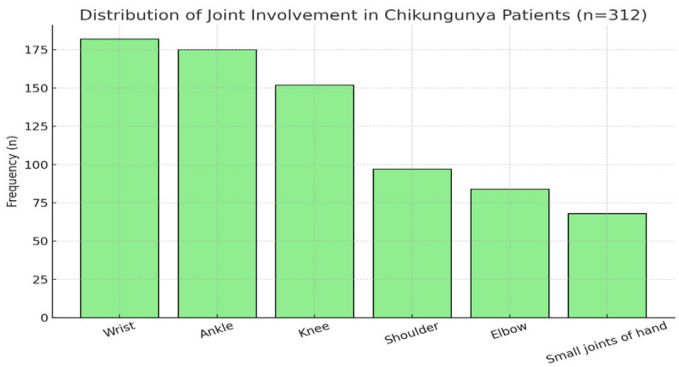

Figure-3: Distribution of respondent according to Joint Involvement

Table -4: Distribution of the respondent according to Serological Findings (n = 340)

Test Result	Frequency (n)	Percentage (%)
IgM positive	231	67.9
IgG positive	75	22.1
Both negative	34	10.0

The majority of the 340 individuals who underwent testing were positive for IgM (67.9%, n=231), indicating that they had a recent or continuing chikungunya virus infection. IgG positive, which indicates prior exposure and potential immunity from a previous infection, was seen in a smaller cohort (22.1%, n=75). However, 10.0% (n=34) of patients tested negative for both IgM and IgG antibodies. This could be due to misclassified cases, other febrile infections with similar symptoms, or very early infection before detectable antibody response. While the occurrence of IgG-positive patients indicates that some members of the population may have previously been exposed to the chikungunya virus, the prevalence of IgM seropositivity highlights the acute nature of the outbreak.

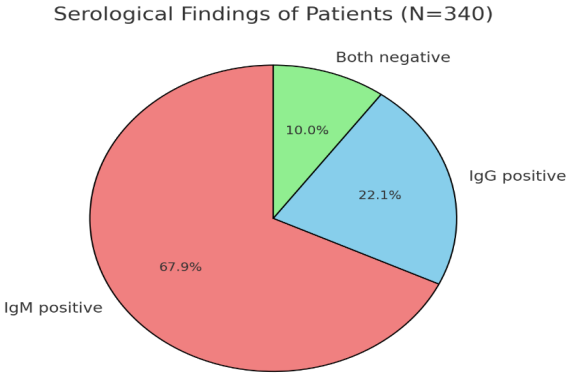

Figure -4: Distribution of the respondent according to Serological Findings

5. Epidemic Curve of weekly Distribution of Chikungunya Cases in Dhaka, Bangladesh (June–September 2025)

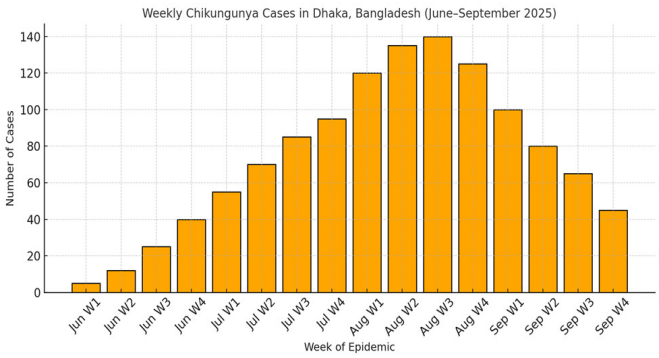

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Figure 5: Chikungunya Case Distribution by Week in Dhaka, Bangladesh (June–September 2025) In line with the usual epidemic pattern of chikungunya outbreaks, the trend shows a slow increase in June, a peak in August, and a steady fall in September and October.

DISCUSSION

According to the study, the main symptoms of chikungunya fever in Dhaka are severe polyarthralgia and an abrupt start of fever. These symptoms are in line with clinical patterns seen in previous outbreaks in Bangladesh and other endemic areas (Anwar et al., 2020). Disabling joint pain, which frequently hinders mobility and day-to-day functioning, remained the hallmark complaint, while other indications like rash, myalgia, and headache were also recorded (Watson et al., 2020). The observed female preponderance could be explained by gender variations in healthcare-seeking behavior or increased exposure to Aedes mosquitoes in domestic settings (Tariq et al., 2024). According to serological results, 22% of IgG positive suggested previous exposure in the community, but 68% of IgM positivity confirmed active infection and continuous transmission during the study period (Mourad et al., 2022).

According to these findings, chikungunya is still prevalent in Dhaka, where there is a baseline immunity from previous outbreaks. Significantly, during follow-up, 18% of patients experienced chronic arthralgia, underscoring the long-term morbidity linked to chikungunya virus infection (Nasif et al., 2025). The necessity for long-term management solutions is highlighted by the fact that chronic joint pain after acute illness is a significant contributor to functional impairment and productivity loss.

There were similarities in the symptom profile between this epidemic and the big one that occurred in Dhaka in 2017, with fever and polyarthralgia being the most common characteristics (Amin et al., 2022. The current study does, however, show a comparatively lower risk of persistent arthralgia (18% vs. nearly 25% in 2017 reports). This could be due to differences in host response and viral strain, better symptom management, or earlier clinical diagnosis (Ramachandran et al., 2014). Furthermore, the study's 68% IgM-positive case percentage indicates continuous active transmission, although surveys conducted after 2017 showed greater IgG seroprevalence, suggesting more extensive previous exposure (Taha et al., 2025). These parallels demonstrate how chikungunya outbreaks in Bangladesh are cyclical, with new vulnerable populations emerging as immunity wanes over time.

These results highlight the need for long-term preventative measures from a public health standpoint. To differentiate chikungunya from dengue and other arboviral diseases, especially during the monsoon and post-monsoon seasons, increased surveillance is required. Community engagement should be a top priority for vector control efforts in order to eradicate Aedes mosquito breeding grounds. Additionally, in order to provide supportive treatment and early diagnosis, physician awareness needs to be raised. Lastly, in order to lessen impairment and enhance patient outcomes, long-term follow-up for patients with chronic arthralgia should be incorporated into standard healthcare services (National Academies Press (US), 2020).

LIMITATION OF THE STUDY

Numerous methodological and contextual constraints should be considered when interpreting the results, even if this study offers insightful information about the clinical and epidemiological characteristics of chikungunya fever in Dhaka. The results might not apply to other areas because the study was limited to one location. Establishing causal links is limited by the cross-sectional design, and early infections or possible co-infections may have been overlooked due to the use of serological testing (IgM/IgG ELISA). Furthermore, memory bias may be introduced by using self-reported symptoms, and the short follow-up period made it unable to evaluate long-term outcomes such chronic arthralgia after the study period ended.

RECOMMENDATION

Based on the study's findings, a number of suggestions can be made to improve clinical care, fortify public health response, and direct future research initiatives. The first step is to set up ongoing surveillance so that early epidemic detection and prompt intervention are possible. Reducing transmission requires vector management measures, such as frequent pesticide applications and extensive

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public awareness campaigns. Third, in order to increase the precision of diagnosis and assist in distinguishing chikungunya from other arboviral illnesses like dengue, clinical training programs are required. Fourth, specialized clinics should be established for long-term patient care in order to treat chronic issues, especially chronic arthralgia. Lastly, it is advised to conduct additional study using multicenter studies with bigger sample sizes, RT-PCR confirmation, and viral genomic analyses. When taken as a whole, these actions may lessen the impact of chikungunya epidemics and enhance diagnosis, treatment, and prevention in Bangladesh and elsewhere.

CONCLUSION

Chikungunya fever continues to be a significant public health concern in Dhaka, Bangladesh, with grave clinical and epidemiological consequences. There was a notable seroprevalence of CHIKV from June to September 2025, with fever and polyarthralgia being the most common clinical signs. The prevalence of arthralgia highlights the potential for long-term morbidity and impairment. Increased physician awareness, effective vector management techniques, better surveillance, and organized follow-up care for chronic cases are all necessary to lower the sickness burden. Multicenter studies using molecular diagnostics are recommended to better understand viral evolution, clinical consequences, and transmission dynamics in order to further inform evidence-based public health interventions.

DECLARATION BY AUTHORS

We, the authors, declare that this manuscript is our original work, has not been published before, and is not under consideration elsewhere. All authors have contributed significantly to the study and approved the final version of the manuscript.

ETHICAL APPROVAL

The study protocol was reviewed and approved. All procedures were performed in accordance with the ethical standards of the Declaration of Helsinki, and written informed consent was obtained from all participants.

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CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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