LETTER TO THE EDITOR

Increased Severity and Changing Epidemiology of Chikungunya Virus Infection in Pakistan: Observations from 2018 and 2024

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Dear Editor,

Chikungunya virus (CHIKV) is a mosquito-borne alphavirus transmitted by Aedes aegypti and Aedes albopictus [1]. It typically presents with acute fever, rash, and disabling polyarthralgia [2]. This article highlights key observations regarding the Chikungunya virus, including its presentation, changes in spread, increasing severity, and disease burden on patients presenting to the emergency, outpatient, and inpatient departments of a tertiary care hospital in Karachi.

Pakistan's first major outbreak occurred in 2016–2017, establishing the virus as an endemic threat and providing a critical. baseline for our comparison. The period of 2018 represented the tail end of that epidemic, characterized by waning transmission as the outbreak subsided [3].

In Pakistan, the outbreak of 2016-2018 resulted in approximately 30,000 suspected cases, out of which nearly 4,000 were confirmed *via* qualitative RT-PCR [4]. Our hospital-based observations in 2018 noted that most patients were aged 25-45, residing in peri-urban areas, and presented with mild to moderate fever, joint pain, headache, and occasional rash. In contrast, the 2024 outbreak demonstrated striking epidemiological and clinical differences. Hospitals in Karachi were overwhelmed, with major government hospitals reporting 500-750 suspected patients daily, with 50-150 confirmed cases per hospital during the peak months [5], while the European Centre for Disease Prevention and Control (ECDC) recorded 2,447 confirmed cases nationwide [6]. Between May and September 2024, Karachi health authorities reported 189 RT-PCR tests, of which 140 were positive [7]. This figure likely reflects significant underreporting, as the high cost of definitive diagnostics, up to PKR 8,000 ($28), makes them inaccessible to many [5]. We have observed that symptom severity has increased by a factor of 10. Acute joint pain, skin rashes, fever, and disruption of daily activities are now severe, while headaches are also reported as moderate in severity. The population distribution, too, has broadened now involving patients aged 18-60 from all parts of the city, including densely populated urban centers.

Several factors may be attributed to this alarming shift in Chikungunya virus epidemiology and severity:

1. Urban Infrastructure: Stagnant water and poor waste disposal create ideal breeding grounds for mosquitoes [8].
2. Climate Change: Prolonged summers and rising temperatures extend mosquito survival and viral transmission [8].
3. Population Dynamics: Rapid urbanization, in-migration, and overcrowding amplify the risk of exposure [8].
4. Healthcare Challenges: The reliance on nontraditional medication and unqualified healthcare providers ("quacks") has led to misdiagnosis, delayed treatment, and further disease complications [9].

Combined, these factors provide a perfect milieu for the resurgence of the Chikungunya virus, with increased virulence and a wider impact on the population.

Although speculation exists about viral mutations or the emergence of new strains, no genomic sequencing data from Pakistan is yet available. However, similar increases in severity have been reported across South Asia, suggesting a possible regional trend [10].

As healthcare providers, we have an obligation to be vigilant in understanding changes in disease presentation and severity, and to differentiate CHIKV from other mosquito-borne illnesses that share similar symptoms, such as Zika and Dengue, which might help reduce the long-lasting and often disabling complications. RT-PCR remains the diagnostic gold standard in the acute phase [2]. The burden of post-chikungunya arthritis-a long-lasting and disabling complication—has also been on the rise [11]. Early recognition, adequate symptomatic treatment, and patient education are crucial to reduce morbidity.

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To address the resurgence of the Chikungunya virus, we recommend:

1. Enhanced Surveillance: Expansion of laboratory-confirmed case reporting and genomic sequencing to monitor viral evolution
2. Vector. Control: Community campaigns starting at the Union Committees targeting stagnant water removal, drainage improvement, and solid waste management.
3. Public Awareness: Media and community outreach promoting repellents, nets, and early care-seeking.
4. Intersectoral. Collaboration: Integration of urban planning, climate adaptation, and health policy to reduce vector habitats in urban Karachi, thereby reducing the burden of disease and safeguarding the population.

The resurgence of CHIKV in 2024 highlights the dynamic nature of arboviral epidemiology in Pakistan. Compared with 2018, the outbreak has affected a wider age group, caused more severe symptoms, and placed an unprecedented burden on hospitals. Continuous surveillance, targeted vector control, and proactive public health strategies are urgently needed to mitigate future epidemics.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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AUTHORS' CONTRIBUTION

M. Ishaq Ghauri: Conceived the idea, provided overall supervision and approved the final version of the manuscript.

Zainullah Noonari: Assisted with literature review, manuscript preparation & editing.

Syed Junaid Humil: Conducted the literature review, and drafted the manuscript.

Syeda Urooj Riaz: Contributed to critical revision of the manuscript and assisted in addressing peer-review comments.

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