

LETTER TO EDITOR

Dengue Fever as a Re-emergent Priority of Public Health; a Letter to Editor

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Dear editor; The latest update from the World Health Organization (WHO) on dengue fever cases globally shows a significant surge in 2024. Between January and mid-August 2024, over 11.2 million suspected dengue cases were reported worldwide, marking a 235% increase compared to the same period in 2023. This alarming rise has been observed across multiple regions, including the Americas, where countries like Brazil and Peru are experiencing particularly high incidences. WHO emphasizes the critical need for strengthened surveillance, timely reporting, and effective control measures to manage this unprecedented spike in cases (1). Dengue is now endemic in over 90 countries, with almost half of the world's population, around 4 billion people, at risk. This increase is driven by factors such as climate change, which has expanded the habitats of the mosquitoes that transmit the virus, and increased global travel, which has facilitated the spread of dengue to new regions, including parts of Europe and the continental United States (2).

Dengue is a viral infection caused by the bite of female mosquitoes mainly from the species *Aedes aegypti* and, to a lesser extent, *Aedes albopictus* that more prevalent in warm, tropical regions. The infection can be caused by any of four related dengue viruses' serotypes, and it manifests in a range of symptoms from very mild (managed at home) to severe cases in about five percent of cases (requiring medical attention and hospitalization). In extreme cases, the infection can be fatal. Till present, there is no definite and specific antiviral treatment for dengue itself, although, the symptoms can be managed in the involved patients.

Dengue epidemics typically follow seasonal patterns, with transmission rates peaking during and after rainy seasons. Contributing factors to the increase in dengue cases include high mosquito population levels, due to climate change and related events such as floods or droughts, and facilitated international travelling, all of which influence mosquito breeding and feeding behaviors, as well as the incubation period of the virus. Additionally, insufficient proactive control mea-

asures and staffing challenges exacerbate the issue.

Dengue fever progresses through three main phases: the febrile, critical, and recovery phases. After an incubation period of 4 to 10 days following a mosquito bite, the febrile phase begins, lasting 2 to 7 days. This phase is marked by a high fever, severe headaches, joint and muscle pain, and sometimes a characteristic rash. The fever may briefly subside before returning. The critical phase usually occurs between days 3 to 7, when the fever decreases, but the risk of severe complications like plasma leakage, shock, and organ impairment increases, requiring close monitoring. If the patient survives the critical phase, they enter the recovery phase, lasting 2-3 days, during which symptoms resolve, vital signs stabilize, and the patient gradually regains strength.

There are warning signs in severe Dengue fever signaling requirement of immediate emergency care. These include severe abdominal pain, persistent vomiting, rapid breathing, bleeding gums, fatigue, restlessness, and blood in vomit. Managing patients with dengue fever in the emergency department (ED) requires careful assessment and appropriate intervention to prevent progression to severe disease, particularly during the critical phase.

Red flags of poor prognosis in dengue fever include persistent vomiting, severe abdominal pain, and lethargy, which may signal severe dengue or the onset of shock. Bleeding manifestations like gum bleeding or hematemesis, signs of shock such as cold skin and hypotension, and a rapid decline in platelet count are critical warning signs. Other indicators include pleural effusion, persistent high fever or a sudden drop in fever, altered mental status, reduced urine output, and liver enlargement with elevated liver enzymes. These symptoms suggest severe complications such as plasma leakage, organ involvement, or impending shock, requiring immediate medical attention.

Management of dengue fever varies based on the severity of the disease. For mild dengue fever, the focus is on supportive care, including hydration, monitoring vital signs, and managing symptoms like fever and pain with paracetamol. Patients should be educated on warning signs of severe dengue and follow-up care is essential, particularly during the critical phase (days 3 to 7) when complications may arise.

In cases of severe dengue fever, immediate assessment and stabilization are crucial. This involves rapid triage, fluid

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resuscitation, and continuous monitoring of hemodynamic status. Management may include the use of blood products for significant bleeding, vasoactive drugs if shock persists, and organ support for liver, kidney, or neurological complications. Patients with severe dengue should be admitted to an ICU for close monitoring, with a gradual transition to recovery as their condition stabilizes. Discharge is considered only when the patient is stable, with follow-up care to ensure continued recovery.

Fluid resuscitation in severe dengue fever is crucial due to significant plasma leakage, which can lead to hypovolemia, shock, and organ dysfunction. Initial treatment involves administering a rapid bolus of isotonic crystalloid solution, followed by careful reassessment of the patient's clinical status. Once stabilized, the fluid rate is reduced to maintenance levels, with close monitoring of hematocrit to guide ongoing therapy. Crystalloids are the first choice, with colloids reserved for patients who do not respond to initial treatment. Continuous monitoring is essential to prevent complications like fluid overload, especially in pediatric, elderly, or comorbid patients. Effective management hinges on frequent reassessment and adjustments based on the patient's evolving condition (3).

Research is ongoing to identify effective antiviral therapies that can target the dengue virus directly. These potential antiviral agents aim to inhibit viral replication or block the virus's entry into cells, thereby reducing the severity of the disease and preventing complications. However, as of now, these treatments are still in experimental stages, and supportive care remains the cornerstone of dengue management.

Immunomodulatory agents and monoclonal antibodies are being explored as potential treatments for dengue fever. The goal of these therapies is to modulate the immune response to prevent the severe inflammation and immune-mediated damage that can occur in severe dengue cases. Monoclonal antibodies, specifically, are designed to neutralize the dengue virus directly or target specific immune pathways that contribute to disease severity. For example, monoclonal antibodies like those targeting the dengue virus's E protein have shown promise in preclinical studies by preventing the virus from entering host cells. However, these treatments are still in the research and development phase and are not yet widely available for clinical use (4, 5).

Vaccines are a crucial tool in the prevention of dengue fever. The first licensed dengue vaccine, Dengvaxia, provides partial protection against the virus, particularly in individuals who have had a prior dengue infection. However, its use is limited due to concerns about its safety in dengue-naïve individuals, where it may increase the risk of severe dengue upon subsequent infection (6).

1. Declarations

1.1. Acknowledgments

None.

1.2. Authors complications

None.

1.3. Availability of data

None.

1.4. Using artificial intelligence chatbots

None.

1.5. Funding and supports

None.

1.6. Conflict of interest

None.

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