A Retrospective Study on Dengue Fever : A Short Communication.

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Submission: 21.06.2019 Acceptance: 16.08.2019 Publication: 31/10/2019
https://www.doi.org/10.63778/PDEASIJRAAS-ARJCPL/2019_103155

Abstract

Dengue fever is a mosquito-borne viral disease that has emerged as a major public health concern in tropical and subtropical regions worldwide. This retrospective study aims to review the epidemiology, pathophysiology, clinical features, diagnostics, and management of dengue fever over the past decades. Emphasis is placed on global trends, challenges in diagnosis and treatment, and the importance of vector control and public health awareness. Recent advancements in vaccine development and outbreak prediction strategies are also discussed.

Keywords: Dengue fever, Aedes aegypti, retrospective study, epidemiology, vector control, dengue vaccine

Introduction

Dengue fever, caused by the dengue virus (DENV), is a significant arboviral disease transmitted primarily by the *Aedes aegypti* mosquito. Over the last 50 years, the global incidence of dengue has increased 30-fold, with annual cases estimated at over 390 million, of which approximately 96 million manifest clinically.[1] The disease presents with flu-like symptoms but can progress to severe dengue, previously known as dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS), with potentially fatal complications.

Epidemiology

Historically confined to Southeast Asia and the Western Pacific, dengue has now spread to more than 100 countries across the Americas, Africa, the Eastern Mediterranean, and South Asia.[2] Urbanization, climate change, poor sanitation, and increased international travel have contributed to the proliferation of the *Aedes* mosquito and the expansion of dengue-endemic regions.[3]

Notably, retrospective analysis of outbreaks in countries like Brazil, India, and the Philippines has shown a cyclical pattern of increased cases every 3–5 years, often associated with the co-circulation of multiple serotypes (DENV-1 to DENV-4), increasing the risk of severe disease.[4]

Pathophysiology and Clinical Manifestations

Dengue virus infection progresses through three phases: febrile, critical, and recovery. The febrile phase typically lasts 2–7 days, followed by a critical phase characterized by increased vascular permeability and risk of shock or hemorrhage. The pathogenesis involves immune-mediated mechanisms, including antibody-dependent enhancement (ADE), which exacerbates disease severity in secondary infections.[5]

Clinical manifestations range from mild febrile illness to severe forms involving plasma leakage, hemorrhage, and organ dysfunction. Warning signs include persistent vomiting, abdominal pain, mucosal bleeding, and hepatomegaly.

Diagnosis and Laboratory Findings

Early diagnosis is crucial for appropriate management. Laboratory tests include:

- **NS1 antigen detection**: Useful in the first 5 days of illness.
- **RT-PCR**: Confirms the presence of viral RNA.
- **IgM/IgG serology**: Differentiates between primary and secondary infections.
- **Hematological tests**: Show leukopenia, thrombocytopenia, and elevated hematocrit in severe cases.

Diagnostic challenges arise due to overlap with other febrile illnesses such as chikungunya, Zika, and COVID-19.[6]

Management and Treatment

There is no specific antiviral treatment for dengue. Management is primarily supportive, including fluid replacement, monitoring of hematocrit, and avoidance of NSAIDs due to bleeding risk. Severe cases require hospitalization and intensive supportive care.

The WHO 2009 classification provides a more practical guide for triage and management, focusing on the presence or absence of warning signs.[7]

Prevention and Control Measures

Vector control remains the cornerstone of dengue prevention. Strategies include:

- Elimination of mosquito breeding sites
- Use of insecticide-treated materials
- Public education campaigns
- Community engagement

Recent innovations such as the release of *Wolbachia*-infected mosquitoes and genetically modified *Aedes* species show promise in reducing transmission.[8]

Vaccine Development

Dengvaxia (CYD-TDV), the first dengue vaccine, was approved in several endemic countries. However, it is recommended only for individuals with prior dengue infection due to increased risk of severe disease in seronegative recipients.[9]

New candidates, including live-attenuated, inactivated, and DNA vaccines, are in various stages of development. Retrospective studies on vaccine efficacy highlight the need for targeted immunization strategies based on seroprevalence and risk-benefit assessments.[10]

Conclusion

Dengue fever continues to pose a global health threat, particularly in densely populated and resource-limited settings. Retrospective analysis reveals important trends in disease transmission and clinical management, highlighting the need for early diagnosis, effective vector control, and vaccine innovation. An integrated approach combining surveillance, education, and research is essential for sustainable dengue control.

Source of Support: Nil

Conflict of Interest: Nil

References

1. Bhatt S, et al. (2013). The global distribution and burden of dengue. Nature, 496(7446), 504–507.
2. WHO. (2024). Dengue and severe dengue. Retrieved from https://www.who.int/news-room/fact-sheets/detail/dengue-and-severe-dengue
3. Gubler DJ. (2011). Dengue, urbanization and globalization: The unholy trinity of the 21st century. Tropical Medicine and Health, 39(4 Suppl), 3–11.
4. Shepard DS, et al. (2016). The global economic burden of dengue: a systematic analysis. Lancet Infect Dis, 16(8), 935–941.
5. Halstead SB. (2003). Neutralization and antibody-dependent enhancement of dengue viruses. Adv Virus Res, 60, 421–467.
6. Wilder-Smith A, et al. (2019). Dengue and other arboviral infections in the time of COVID-19. Lancet, 395(10234), 1159–1160.
7. World Health Organization. (2009). Dengue: Guidelines for Diagnosis, Treatment, Prevention and Control.
8. O'Neill SL, et al. (2018). Scaled deployment of Wolbachia to protect the community from dengue and other Aedes transmitted arboviruses. Gates Open Res, 2, 36.
9. Sridhar S, et al. (2018). Effect of dengue serostatus on dengue vaccine safety and efficacy. N Engl J Med, 379, 327–340.
10. Biswal S, et al. (2020). Efficacy of a tetravalent dengue vaccine in healthy children and adolescents. N Engl J Med, 381, 2009–2019.