



CORRESPONDENCE

Dengue-Associated Myocarditis: Clinical Spectrum, Pathogenesis, and Implications for Shock and Mortality

Kainat Ahmed¹ | Ehsan Ul Haq²

¹Department of General Surgery, Frimley NHS Foundation Trust, UK | ²Department of Anesthesia & Intensive Care Unit, Al-Aleem Medical College, Lahore, Pakistan

*Correspondence: Ehsan Ul Haq (ehsanulhaqkhan33@gmail.com)

Citation: Ahmed K, Haq EU. Dengue-Associated Myocarditis: Clinical Spectrum, Pathogenesis, and Implications for Shock and Mortality. J Biomol Pathog Ther. 2025;1(1):51–52. <https://doi.org/10.68041/jbpt.v1i1/11>

Received: 29 November, 2025

Revised: 18 December, 2025

Accepted: 23 December, 2025

Published: 30 December, 2025

Dear Editor

Dengue fever is one of the most common mosquito-borne viral infections of the tropical or subtropical areas with frequent outbreaks resulting in high mortality rates globally ¹. The well-known symptoms of dengue fever include fever, myalgias, headache, and thrombocytopenia, whereas its significant participation in myocardial infection is still underestimated. Substantial evidences suggest key role of myocarditis in driving dengue shock syndrome leading to hospitalization and death ².

A recent study reported pooled prevalence of myocarditis in around 21% of dengue confirmed patients using systematic diagnostic criteria, which suggests significant association of dengue disease with cardiac complications ³. In another study, myocarditis was found in approximately 4.2% of hospitalized dengue patients particularly in cohorts from low- and middle-income clinical settings. Among the dengue confirmed patients who had myocarditis developed cardiogenic shock, 21.4% more in-hospital mortality rate was recorded in patients with cardiac complications as compared to patients with a healthy heart ⁴.

Dengue myocarditis is based on several factors for its pathophysiology ⁵. Direct viral-based myocardial injury and immune-mediated inflammation play a major role in cellular dysfunction in the myocardium ⁶. Proinflammatory cytokines and endothelial dysfunction also increase capillary leakage in the peripheral tissues, and in the myocardium, exacerbating cardiac performance resulting in depressed left ventricular activity, diastolic dysfunction, and arrhythmias ⁷. Clinical manifestations of dengue myocarditis ranges from mild subclinical disease to heart failure ⁸. Mild electrocardiographic disturbances or abnormal increase in cardiac biomarker have also been reported in many patients ⁹. However, in more severe cases, dyspnea, palpitations, hypotension and shock may occur resulting in hemodynamic fluctuations similar to plasma leakage- a characteristic feature of severe dengue. Such cases are documented to develop severe arrhythmias, cardiogenic shock, and even death, mostly in case of delayed diagnosis ¹⁰.

Dengue-related myocarditis presents a great challenge in its diagnosis either due to a high proportion of subclinical cases or due to the clinical manifestations such as tachycardia, hypotension, and fluid movements, which are often misleading and suggest dengue onset ¹¹. Echocardiographic structural assessment alone is insufficient and must be combined with the biomarker levels, and imaging to get a discerning diagnosis. Myocarditis, in case of dengue, has significant prognostic implications and patients suffering from myocarditis usually have prolonged hospital stays, need long-term supportive care, and have higher death rates ¹². Even though cardiogenic shock is not as frequent as hypovolemic shock caused by plasma leakage, it is a fatal complication that must be addressed with standard management measures ¹³. Dengue myocarditis is one of the blind spots in clinical research, despite the increasing evidence particularly in resource-limited countries where dengue cases are alarming ¹⁴.

Early diagnosis of cardiac dysfunction results in timely surveillance using ECG, biomarkers and echocardiography, guiding more specific hemodynamic therapy and lowering the overall death rate. The outcomes could be further improved by increasing awareness of the clinicians and the routine cardiac examination of moderate to severe dengue patients. Dengue myocarditis is a significant yet an overlooked heinous cause of shock and death; its real burden is likely to be under-reported due to the challenges of its diagnosis and similarity to the traditional dengue pathophysiology. Better clinical vigilance, rigorous examination of the heart in patients at high risk and more research about the customized management is urgently required. These practices can be used to address current gaps in care and coping with this uncharacteristic health complication.

Acknowledgment

None

Grant Support & Funding Source

None

Conflict of Interest

None

Use of Artificial Intelligence

The corresponding author declared that no other artificial intelligence or AI-assisted tools were used anywhere in this manuscript

Authors' Contribution

Both Authors contributed to all aspects of work as per ICMJE.

References

1. Nasar S, Rashid N, Iftikhar S. Dengue proteins with their role in pathogenesis, and strategies for developing an effective anti-dengue treatment: A review. *J Med Virol*. 2020 Aug;92(8):941–955. <https://doi.org/10.1002/jmv.25646>
2. Farias LA, Costa LB, Bessa PP, Alcântara GF, Oliveira JL, Silva TD, et al. Dengue mimickers: Which clinical conditions can resemble dengue fever? *Rev Soc Bras Med Trop*. 2024;57:e00206-2024. <https://doi.org/10.1590/0037-8682-0334-2024>
3. Sandeep M, Padhi BK, Yella SS, Sruthi KG, Venkatesan RG, Sasanka KB, et al. Myocarditis manifestations in dengue cases: A systematic review and meta-analysis. *J Infect Public Health*. 2023 Nov;16(11):1761–1768. <https://doi.org/10.1016/j.jiph.2023.08.005>
4. Baqi A, ur Rehman F, Memon PS, Omair SF. Prevalence and outcomes of myocarditis in dengue-infected patients admitted to a tertiary care hospital of a low-middle-income country. *Glob Heart*. 2022;17(1):44. <https://doi.org/10.5334/gh.1129>
5. Cristodulo R, Luoma-Overstreet G, Leite F, Vaca M, Navia M, Duran G, et al. Dengue myocarditis: A case report and major review. *Glob Heart*. 2023;18(1):41. <https://doi.org/10.5334/gh.1254>
6. Martens CR, Accornero F. Viruses in the heart: Direct and indirect routes to myocarditis and heart failure. *Viruses*. 2021 Oct;13(10):1924. <https://doi.org/10.3390/v13101924>
7. Drera A, Rodella L, Brangi E, Riccardi M, Vizzardi E. Endothelial dysfunction in heart failure: What is its role? *J Clin Med*. 2024 Apr;13(9):2534. <https://doi.org/10.3390/jcm13092534>
8. Khan AA, Khan FU, Akhtar SA, Ghaffar R. Dengue beyond fever—fatal dengue myocarditis and complete heart block: A case report and brief overview of cardiac manifestations of dengue fever. *SAGE Open Med Case Rep*. 2023 Aug;11:2050313X231193983. <https://doi.org/10.1177/2050313X231193983>
9. Shah C, Vijayaraghavan G, Kartha CC. Spectrum of cardiac involvement in patients with dengue fever. *Int J Cardiol*. 2021 Jan;324:180–185. <https://doi.org/10.1016/j.ijcard.2020.09.034>
10. San Martin YR, dos Santos Silva KG, de Sousa Dias AL, Soares BG, Julio BS, Cuba JA, et al. Cardiovascular complications associated with dengue virus infection. *Braz J Health Rev*. 2024;7(9):e75044. <https://doi.org/10.34119/bjhrv7n9-219>
11. Farrukh AM, Ganipineni VD, Jindal U, Chaudhary A, Puar RK, Ghazarian K, et al. Unveiling the dual threat: Myocarditis in the spectrum of dengue fever. *Curr Probl Cardiol*. 2024 Jan;49(1):102029. <https://doi.org/10.1016/j.cpcardiol.2023.102029>
12. Wee LE, Tan JY, Chua BH, et al. Cardiovascular complications in acute dengue infection: A population-based cohort study. *Lancet Reg Health West Pac*. 2025 Oct;64:101713. <https://doi.org/10.1016/j.lanwpc.2025.101713>
13. Tejo AM, Hamasaki DT, Menezes LM, Ho YL. Severe dengue in the intensive care unit. *J Intensive Med*. 2024;4(1):16–33. <https://doi.org/10.1016/j.jointm.2023.07.007>
14. Barberato SH, Cardim N, Rassi DD, Baritussio A, Beck AL, Cosyns B, et al. Cardiac imaging in patients with tropical diseases: A scientific statement of the European Association of Cardiovascular Imaging (EACVI) of the European Society of Cardiology and the Cardiovascular Imaging Department of the Brazilian Society of Cardiology (DICSBC). *Eur Heart J Cardiovasc Imaging*. 2025 Aug;26(8):1315–1332. <https://doi.org/10.1093/ehjci/jeaf15>

