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FIRST CASE REPORT OF HEART FAILURE INDUCED BY DENGUE INFECTION IN RSUD JAGAKARSA

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A B S T R A C T

Dengue cases in DKI Jakarta has increased in last 3 months with 6 death cases has been reported. Dengue virus (DENV) infection may be associated with increased risks of HF. We report a patient with DENV infection who developed HF on the 4th day of treatment. A-63th-year old woman was presented to hospital with four days of fever. There was no breath difficulty or bleeding manifestations. Hypertension was recorded as her past medical history. Diagnosis of dengue fever was made based on positive NS1 and decreased values of thrombocytes 138.000(Ht 50). Chest radiograph and electrocardiogram showed normal findings. On the fourth day of treatment, she complained of dyspnoea and orthopnoea without chest pain. Blood pressure was 220/120mmHg, pulse rate was 110/min, respiratory rate was 35/min, and peripheral oxygen saturation was 89% room air. Electrocardiogram shows sinus tachycardia and batwing appearance was found in chest radiograph. Echocardiography revealed decrease of the EFV to 43%. The patient then treated as heart failure and resulted in significant clinical improvement. The precise mechanism involved in the increased risk of HF by DENV is not thoroughly understood. HF induced by DENV infection may be underdiagnosed. Some studies have demonstrated that DENV directly infects cardiomyocytes leading to myocarditis. It also elevates proinflammatory cytokines, which interfere with ventricular contraction, resulting in HF. The difference of primary treatment for DENV infection and HF, make physician should raise awareness if their dengue patient complains of dyspnoea on exertion immediately after being diagnosed with DENV. This presented case demonstrated that DENV can be associated with increased risk in HF. Physicians should have more awareness of this and provide early management of HF while taking care of DENV infection patients.

Background

Dengue cases in DKI Jakarta has increased in last 3 months. There were 3800 dengue cases with 6 death cases has been reported. Among hospitalized 134 dengue patients in RSUD Jagakarsa, we found one patient that developed heart failure. Dengue virus (DENV) infection may be associated with increased risks of Major Adverse Cardiovascular Effect (MACE). Heart failure is the most common MACE in dengue. We report a patient with DENV infection who developed HF on the 4th day of treatment

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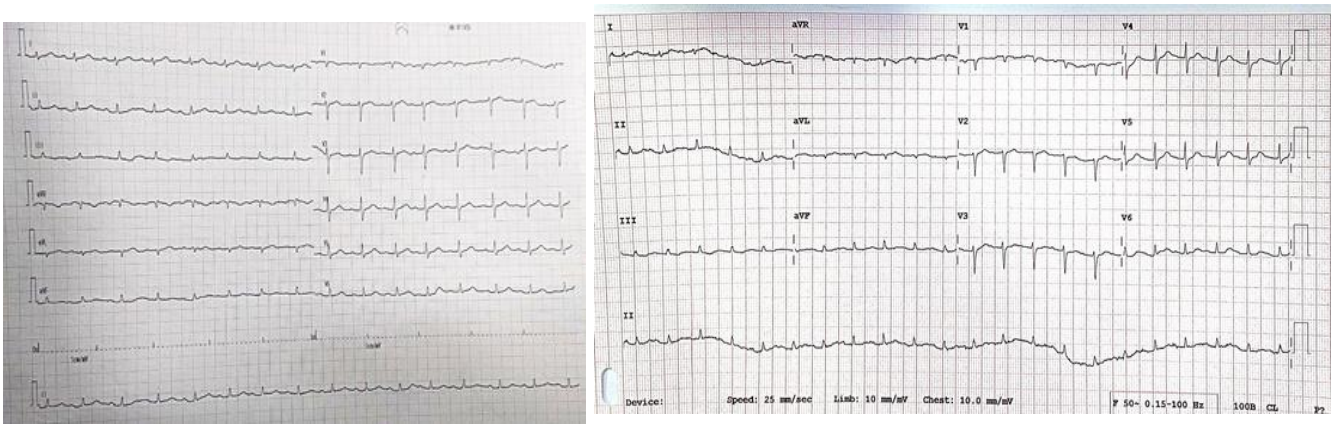
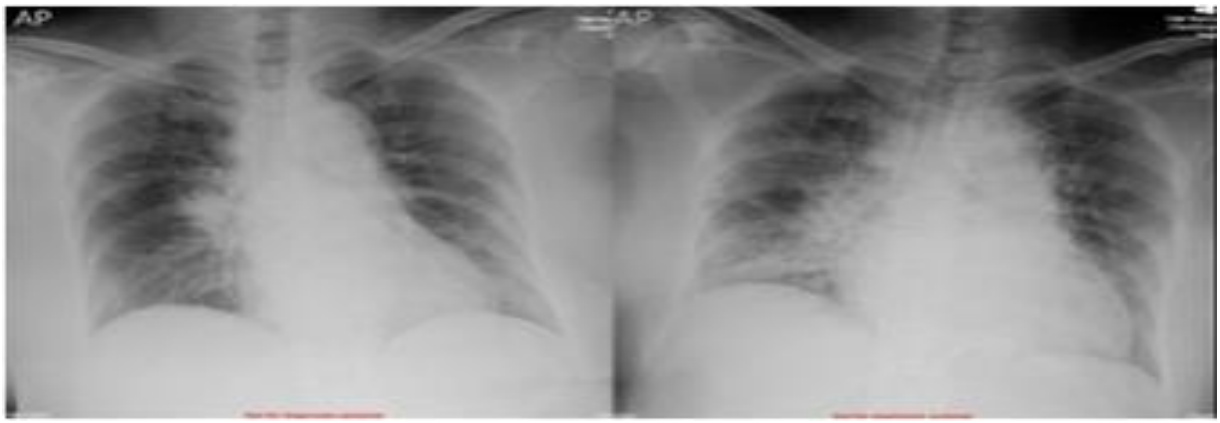
Case Illustration

A-63th-year old woman was presented to hospital with four days of fever, nausea and vomitting. There was no breath difficulty or bleeding manifestation. Hypertension was recorded as her past medical history and was treated with amlodipine 10mg daily. Vital sign measurement result was normal. General physical examination showed no abnormal findings. Laboratory examination : Haemoglobin 12,7, Leucocytes 14.590, Hematocrite 50 Trombosit 138.000 NS1 positive. Chest radiograph and electrocardiogram showed normal findings. Patient assessment as Dengue fever day 4 and Hypertension.

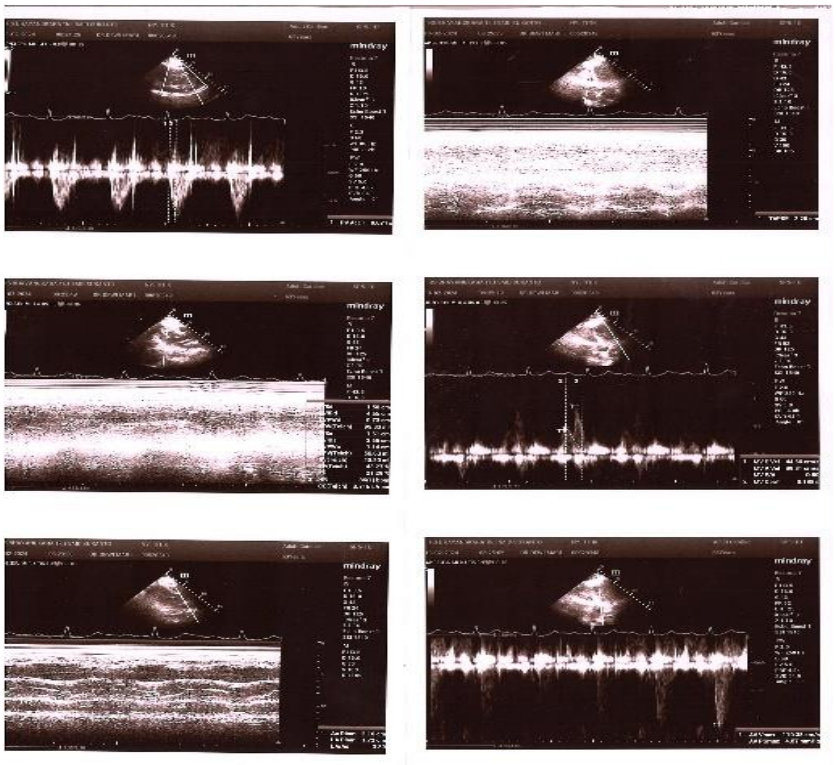
On the fourth day of treatment, the patient's clinical condition had worsened. She complained of dyspnoea and orthopnoea without chest pain. Vital sign measurement Blood pressure 220/120mmHg, Heart rate 110/min Respiratory rate: 35/min, SatO2 89% room air. General physical examination found rales in bilateral lower lung fields and raised jugular venous pressure. Electrocardiogram: Sinus tachycardia. Chest radiograph expertise Suggestive of pulmonary edema. Echocardiography founded LVH Consentric, Systolic Functionod LV decreased EF:43.27%, Systolic Function of RV Normal, Hypokinetic Anteroseptal anterior, Normal valves, Dyastolic dysfunction gr 1, Trombus (-). Patient assest with Acute Decompensated Heart Failure and Dengue Fever day 8. The patient then treated as heart failure and resulted in significant clinical improvement



Pict 1. The patient's ECG on admission (left) and on fouth day of treatment (right)



Pict 2. The patient's chest radiograph on admission (left) and on fouth day of treatment (right)



Pict 3. The patient's echocardiogram

Discussion

The precise mechanism involved in the increased risk of HF by DENV is not thoroughly understood. HF induced by DENV infection may be underdiagnosed. Some studies have demonstrated that DENV is taken up into macrophages with the resulting T-cell activation and release of vasoactive and proinflammatory cytokines implicated in the capillary leak and possibly also in myocardial impairment. The interaction between the NS1 and the glycocalyx layer of the vascular endothelium is thought to increase capillary permeability. The resulting plasma leakage can contribute to the cardiac dysfunction in the form of reduced preload, altered coronary microcirculation, and myocardial interstitial oedema. Based on Kai,2022 HF events were highest within seven days after having dengue infection, highest in those >60 years old and lower in 0–40 years old, Females had a higher risk of MACEs than males, and the risk was nearly nine times higher among admission (for dengue infection) than nonadmission cases

Conclusion

The spectrum of cardiovascular manifestations in dengue is broad, ranging from myocardial impairment and arrhythmias to vascular barrier dysfunction causing plasma leakage and haemodynamic compromise. Myocardial impairment can contribute to haemodynamic instability during the critical phase of capillary leakage**.** This presented case demonstrated that DENV can be associated with increased risk in HF. Physicians should have more awareness of this and provide early management of HF while taking care of DENV infection patients.

References

1. Libby P, Loscalzo J, Rideker PM, Farkouh ME, Hsue PY, Fuster V, et al. Inflammation, immunity, and infection in atherothrombosis: JACC review topic of the week. *J Am Coll Cardiol* 2018; 72(17): 2071–81. doi: 10.1016/j.jacc.2018.08.1043
2. Musher DM, Abers MS, Corrales-Medina VF. Acute infection and myocardial infarction. *N Engl J Med* 2019; 380(2): 171–76. doi: 10.1056/NEJMra1808137
3. Salgado DM, Eltit JM, Mansfield K, Panqueba C, Castro D, Vega MR, et al. Heart and skeletal muscle are targets of dengue virus infection. *Pediatr Infect Dis J* 2010; 29(3): 238–42. doi: 10.1097/INF.0b013e3181bc3c5b
4. Yacoub S, Wertheim H, Simmons CP, Screaton G, Wills B. Cardiovascular manifestations of the emerging dengue pandemic. *Nat Rev Cardiol* 2014; 11(6): 335–45. doi: 10.1038/nrcardio.2014.40
5. Kai CW , Cheng LS, Wen HW, Chiia L, Shang HC, et al. Major acute cardiovascular events after dengue infection–A population-based observational study. PLoS Negl Trop Dis. 2022 Feb; 16(2): e0010134. doi: 10.1371/journal.pntd.0010134