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Case Report

Acute Epstein-Barr virus-related myocarditis: life-threatening complication in immunocompetent patient

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ABSTRACT

Acute Epstein-Barr virus (EBV) related myocarditis is an uncommon but potentially life-threatening condition, particularly in immunocompetent individuals. We present a case of a 14-year-old male with no prior medical history who presented with high-grade fever, sore throat, and dyspnea on exertion. Laboratory tests and echocardiography confirmed the diagnosis of myocarditis secondary to EBV infection. The patient required conservative treatment. Follow-up at post-discharge revealed complete recovery, with normal echocardiographic findings and no residual symptoms. This case underscores the importance of early recognition and intervention in EBV-related myocarditis. Despite its rarity, clinicians should consider viral myocarditis in patients with systemic EBV infection and cardiac symptoms. Aggressive supportive care can lead to full recovery, as demonstrated by this case. It can present as a dengue-mimic.

Keywords: Epstein-Barr virus, Myocarditis, Dengue-mimic

INTRODUCTION

Myocarditis, inflammation of the heart muscle, can lead to significant morbidity and mortality if not promptly diagnosed and treated. It has been linked to various etiologies, including viral infections, with viruses like coxsackievirus, adenovirus, and Epstein-Barr virus (EBV) being common culprits.[1] The myocarditis treatment trial highlighted the challenges in diagnosing and treating myocarditis, emphasizing the variability in clinical presentations and outcomes.[2] Sudden unexpected death in young individuals can sometimes be attributed to myocarditis, as shown in various studies.[3] Myocarditis associated with EBV, although rare, has been documented in the literature. The pathophysiology involves direct viral invasion and immune-mediated injury to the myocardium.[4] The incidence and management of viral myocarditis, including that caused by EBV, are critical areas of study, given the potential severity of the disease.[5] The clinical presentation can range from mild symptoms to severe heart failure or sudden death.[6]

CASE REPORT

A 14-year-old male with no previous comorbidities presented with high-grade fever (102-103°F) with chills, rigor, perspiration, periorbital pain, and sore throat for six days. He also experienced generalized body ache, easy fatigability for three days, and dyspnea on exertion for one day. On admission, the patient's vitals showed significant instability. His temperature was consistently high, his pulse rate increased progressively, and his blood pressure was notably low, necessitating the initiation of noradrenaline and dobutamine infusions. His sensorium fluctuated, worsening to the point of requiring intubation and mechanical ventilation by day 3. By day 7, the patient's condition improved significantly, allowing the cessation of inotropic and ventilatory support.

Table 1: Vitals according to days of admission.

Vitals	Day 1	Day 3	Day 5	Day 7
Temperature -°C	102.4	101.4	100.5	99.2
Pulse (/minute)	112	126	132	96
Blood pressure (mmHg)	86/60	80/56 (started on noradrenaline infusion 1 mcg/kg/minute with increasing rate)	102/66 mmHg (noradrenaline 0.5 mcg/kg/minute, dobutamine 5 mcg/kg/minute with reducing rate)	110/66 (off noradrenaline and off dobutamine)
Sensorium	Conscious, oriented to time, place and person, drowsy	Sensorium worsened, drowsy, reactive to painful stimuli (intubated, mechanical ventilation)	Conscious, oriented, improved	Conscious, oriented, improved (extubation done)

Table 2: Investigations.

Investigations	Day 1	Day 3	Day 5	Day 7
Hemoglobin (12.0-15.0 g/dl)	13.2	12.2	12.0	12.2
White blood cell (4000-1000 cells/cumm)	7,200	6,200	5,800	8,800
Platelet (150,000-450,000/cumm)	420,000		380,000	394,000
Serum sodium (135-145 meq/liter)	136.8	140.6	138.6	144.4
Serum potassium (3.5-5.0 meq/liter)	3.9	4.4	3.6	4.2
Serum calcium (8.5-10.5 mg/dl)	8.9			
Serum creatinine (0.7-1.3 mg/dl)	1.3	1.2	1.1	1.2
Blood urea (8-24 mg/dl)	30	32	20	18
Serum albumin (3.5-5.5 gm/l)	3.2	3.0	3.2	3.6
SGPT (<40 IU/l)	90	96	76	54
HIV/HBV/HCV ag		Negative		
Serum trop-I			11.2 (100×UNL)	
EBV VCA IgM[7]				150.2 (4.2×UNL)
2D Echo			Ejection fraction - 40%, generalized left ventricular hypokinesia, thin rim of pericardial effusion	
ABGA		pH - 7.347, pCO_2 - 37, pO_2 - 73, lactate - 2.37		
Malaria smear/antigen dengue Ns1/IgM		Negative		
CECT brain, CSF		Normal		
USG whole body lymphnode		Cervical and axillary lymphadenopathy, maximum size 28×14 mm		
USG chest			Left sided 4 cm effusion band (managed conservatively)	
ECG		Generalised ST-T changes, sinus tachycardia		

CECT-Contrast enhancement CT scan, UNL-upper normal limit

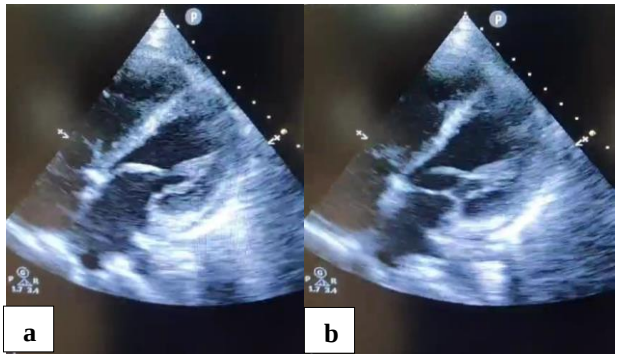

Figure 1: Echocardiogram on day 5 of admission in (a) diastole and (b) systole.

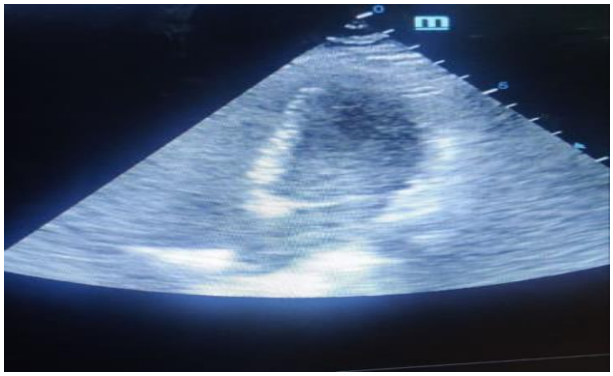

Figure 2: Normal echocardiogram at 3 months follow-up.

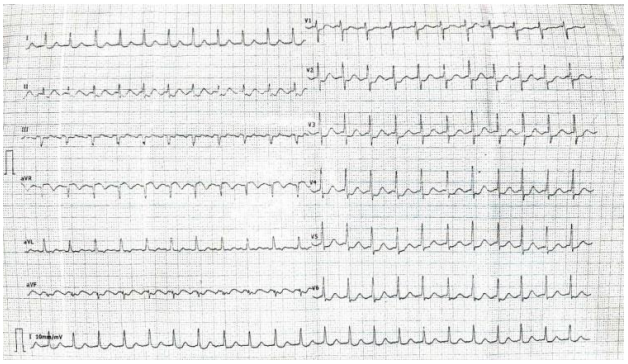

Figure 3: Electrocardiogram on day 3 of admission.

Treatment and follow up

Considering the dengue epidemic in area at the time of admission, provisional treatment with fluids was started. Despite adequate fluid resuscitation, the patient remained hypotensive and drowsy. Vasopressor and inotropic support were initiated followed by mechanical ventilation. By day 7 patient was improved and inotropic and ventilatory support was weaned off. Patient was started on tablet furosemide 40 mg once a day, tablet enalapril 5 mg once a day, and tablet digoxin 0.125 mg once a day (5 days a week) for residual shortness of breath and congestive symptoms.

Follow up examination and echocardiography was done at 1 month, 3 month and 6 month post discharge.

On 3rd and 6th month follow up, patient was completely asymptomatic and 2D echo revealed no abnormalities, all medications were stopped at 3 month post discharge.

DISCUSSION

This case underscores the importance of considering myocarditis in patients presenting with fever and cardiac symptoms, particularly when associated with a recent viral illness. EBV is a common virus that typically causes infectious mononucleosis, but in rare cases, it can lead to severe complications such as myocarditis.[1]

The pathogenesis of EBV-related myocarditis involves both direct viral injury to the myocardium and immune-mediated damage. This dual mechanism can complicate the clinical course and management of the disease.[4,6] Early diagnosis and supportive care are crucial in managing myocarditis; as specific antiviral or immunosuppressive therapies have not been proven effective in all cases. The role of immunosuppressive therapy remains controversial, with studies such as the Myocarditis Treatment Trial indicating no significant benefit in viral myocarditis.[7]

Management primarily focuses on treating heart failure symptoms and preventing complications. In our patient, standard heart failure treatment resulted in complete recovery, highlighting the importance of supportive care.[5,7] The literature on EBV-related myocarditis is limited, with most information derived from case reports and small series. This case contributes to the growing body of evidence on the varied clinical presentations and outcomes of EBV myocarditis. It also emphasizes the need for further research to establish standardized diagnostic and treatment protocols.[8-10]

CONCLUSION

Acute EBV-related myocarditis is a rare but potentially life-threatening condition, even in immunocompetent individuals. High clinical suspicion and early intervention are vital for improving patient outcomes in cases of severe myocarditis. Intensive care management, including the use of vasopressors, inotropes, and mechanical ventilation, can stabilize patients with severe cardiac involvement.

With timely and appropriate treatment, patients can achieve full recovery, as evidenced by the case's six-month follow-up showing no residual cardiac abnormalities. Continuous follow-up and echocardiographic monitoring are essential to ensure complete recovery and guide the discontinuation of medications. This study advances knowledge by emphasizing the importance of early recognition and comprehensive supportive care in managing EBV-related myocarditis, thereby contributing to better patient outcomes and understanding of the disease's pathogenesis and treatment.

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REFERENCES

1. Mason JW, O'Connell JB, Herskowitz A, Rose NR, McManus BM, Billingham ME, et al. A clinical trial of immunosuppressive therapy for myocarditis. The Myocarditis Treatment Trial Investigators. N Engl J Med. 1995;333(5):269-75.
2. Drory Y, Turetz Y, Hiss Y, Lev B, Fisman EZ, Pines A, et al. Sudden unexpected death caused by myocarditis. Harefuah. 1991;120(6):306-8.
3. Maisch B, Pankuweit S. Current Treatment Options in Myocarditis. Dtsch Arztebl Int. 2012;109(31-32):505-11.
4. Esfandiarei M, McManus BM. Viral Myocarditis: Incidence, Diagnosis, and Clinical Management. Heart Fail Clin. 2008;4(4):307-19.
5. Blauwet LA, Cooper LT. Myocarditis. Prog Cardiovasc Dis. 2010;52(4):274-88.
6. Kühl U, Schultheiss HP. Viral myocarditis. Swiss Med Wkly. 2009;139(35-36):438-45.
7. Shioji K, Kishimoto C, Komiyama T, Yamaguchi H, Hayashi T, Takayama M, et al. Acute Myocarditis Associated with Epstein-Barr Virus Infection. Jpn Circ J. 2004;65(6):539-42.
8. Magnani JW, Dec GW. Myocarditis: Current Trends in Diagnosis and Treatment. Circulation. 2006;113(6):876-90.
9. Hufnagel G, Pankuweit S, Richter A, Schönian U, Maisch B. The European Study of Epidemiology and Treatment of Cardiac Inflammatory Diseases (ESETCID). First Epidemiological Results. Herz. 2021;46(4):330-6.
10. Caforio ALP, Pankuweit S, Arbustini E, Basso C, Gimeno-Blanes J, Felix SB, et al. Current state of knowledge on aetiology, diagnosis, management, and therapy of myocarditis: a position statement of the ESC Working Group on Myocardial and Pericardial Diseases. Eur Heart J. 2013;34(33):2636-48.

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