An acute myopericarditis in a young adult: consider an acute Epstein-Barr viral infection

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Abstract

We present a case of an uncommon viral myopericarditis in a 19-year-old man with chest pain. Electrocardiographic abnormalities and elevated cardiac enzymes were present. Myopericarditis of unknown origin was diagnosed following cardiac magnetic resonance imaging. During admission, the patient developed tonsillitis and serology tests confirmed an acute Epstein-Barr viral infection. Therefore, in acute myo(peri)carditis, we suggest early viral determination.

Keywords

Myopericarditis; Epstein-Barr virus; cardiac magnetic resonance imaging.

Case report

A 19-year-old man presented to the cardiac emergency room complaining of acute chest pain radiating to the left arm of 60 min duration, accompanied by dyspnea. The morning of presentation, he woke up at 05:00 h with a fever and sweating heavily. The day before he had muscle pains all over, and during a short period posture-dependent chest discomfort, especially when lying down. He had experienced some dyspnea, and a temperature rise to 39°C.

He had no medical history. He did not smoke and was without risk factors for cardiovascular disease. The vital signs were stable. The physical examination and chest radiograph showed no abnormalities. The electrocardiogram (ECG) showed sinus rhythm with ST segment deviations, as may be seen in pericarditis (Fig. 1a). Repeated echocardiography showed a normal left ventricular function, no wall motion abnormalities, and no pericardial effusion. Laboratory examinations showed an increased level of myocardial enzymes: troponin T 2.1μg/l (normal <0.03μg/l), creatine kinase MB 66.8μg/l. Aspartate aminotransferase, alanine aminotransferase, C-reactive protein, and leucocytes were also increased. Cardiac magnetic resonance imaging (CMR), performed 1 day after admission, showed typical signs of myocarditis (Figs. 2 and 3).

During hospitalization, the patient developed high peaking fevers and tonsillitis without airway obstruction, after which an ultrasound scan of the neck showed extensive lymphadenopathy. An ultrasound scan of the abdomen was made because of the elevated liver enzymes, but showed...
no abnormalities. There were no rhythm disturbances besides sinus tachycardia and frequent premature ventricular complexes.

Serology results, Epstein-Barr virus (EBV) VCA IgG 31 E/ml, EBV VCA IgM >140 E/ml (reference value <20), EBNA IgG <5 E/ml, indicated an acute EBV infection. Tests for other viruses, i.e. human immunodeficiency virus, hepatitis A, B, and C, and polymerase chain reaction for respiratory viruses were negative. Following the diagnosis of viral myopericarditis, therapy with nonsteroidal anti-inflammatory drugs was started. The patient improved in 2.5 weeks until he could be discharged. At 2 months follow-up at the outpatient clinic, the patient was doing well without symptoms or laboratory abnormalities. The ECG was normalized, without significant abnormalities (Fig. 1b).

**Discussion**

In this report, we describe a young adult patient with chest pain including elevated cardiac enzymes and ECG abnormalities. At presentation, diagnoses of myopericarditis and acute coronary syndrome were considered. As echocardiography showed no wall motion abnormalities, CMR was performed. The results of the CMR and increased levels of cardiac enzymes provided evidence for the diagnosis of myopericarditis.

In our patient, no abnormalities were found in a series of echocardiograms. This is in contrast to the study of Nieminen et al.[11], which showed regional changes in the left ventricular contraction in a series of consecutive patients with acute myocarditis. Nonetheless, myocarditis was evident from CMR in our patient, showing signs of myocarditis with diffuse involvement of the myocardium, in accordance with previous studies[2], and a predominant involvement of the
lateral free wall\cite{3}, in line with Mahrholdt et al.\cite{3}, CMR was an essential tool for the diagnosis of acute myopericarditis in our patient.

Quite unexpectedly, following signs of tonsillitis, serology showed an acute EBV infection, which is an uncommon cause of myocarditis in adults. There are only a few reports on EBV-related myocarditis in adults\cite{4-6}; it is predominantly seen in newborns and infants, and is rare in healthy adults, as the clinical trial of Bowles et al. showed\cite{7}.

Our case illustrates that even in an adult patient, EBV needs to be considered as a cause of myopericarditis. Usually, other viruses are more commonly considered, i.e. enterovirus and adenovirus\cite{7,8}, and the recently more common viruses such as Human Herpes Virus-6 and parvovirus B19\cite{9}. Since there is increased mortality and morbidity in viral myocarditis, and a high prevalence of up to 67% of viral genomes was found in patients with dilated cardiomyopathy\cite{10}, we suggest a need for early viral determination.

Fig. 2. Cardiac magnetic resonance imaging. The T2 STIR dark blood views showed hyperlucent areas intramyocardially (arrows) in the apex, but also in the subendocardial parts of the anterior wall.

Fig. 3. Cardiac magnetic resonance imaging. Late enhancement showed scattering diffusely over the myocardium (arrows), specifically mid wall but also in the epicardial and subendocardial zones. The expression is most extensive in the posterolateral and in the anterior and posterior wall. It is less extensive in the anteroseptal wall.
Teaching points

- Even without abnormalities on the echocardiogram, there may be extensive abnormalities on CMR consistent with myocarditis.
- In order to optimize patient outcome, early viral determination is advocated in myo(peri)carditis.
- In an immunocompetent adult with myo(peri)carditis, EBV infection should be considered.

References