

Virus detection within endomyocardial biopsy in pediatric myocarditis: results from the German multi-center registry “MYKKE”

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Objectives

Endomyocardial biopsy (EMB) in pediatric patients is divergently discussed, but it might identify the underlying etiology of acute severe heart failure, trigger therapeutic interventions and might have a prognostic value. The aim of this prospective study was to analyze the histological pattern and viral distribution in EMB from pediatric patients with suspected myocarditis.

Methods

EMB derived from patients enrolled between September 2013 and December 2018 in the German prospective multicenter registry “MYKKE” were analyzed. EMB were studied with the use of histological (Dallas), immunohistological and molecularpathological analyzes; virus genome detection was done by polymerase chain reaction in the same laboratory.

Results

In 56% (205/364) of patients an EMB was performed; 11 patients had two EMB. All in all, 226 EMB reports were available for analysis. Median age at EMB was 12.9 (1.2-16.2) years. Biopsies derived from right ventricle in 84%, from left ventricle in 11% and both in 5%. In 72% (162/226) of the biopsies inflammatory reaction and therefore a myocarditis was positively detected: acute myocarditis (20%), subacute/chronic myocarditis (39%), status post myocarditis (12%), borderline myocarditis (4%), and hypersensitivity myocarditis (1%). In 5% no relevant inflammation and in 6% a DCM, 2% LVNC and 2% HCM was diagnosed; 8% had other diagnosis. In 44% (100/226) cardiotropic viruses in the myocardium could be detected (59% PBV19; 17% HHV6; 12% PVB19/HHV6; 4% Enterovirus; 3% CMV; 2% EBV, 1% HHV6/7, 1% HHV7). In 9% (21/226) simultaneously detection of virus within the myocardium and blood was ascertained, mostly in acute myocarditis (62%).

Conclusion

The rate of myocarditis (72%) and myocardial viral DNA (44%) detection in pediatric EMB for suspected myocarditis is unexpected high, while simultaneous virus detection in the blood could mostly not be proven. It seems that at a certain stage of symptomatic myocardial inflammation the virus titers within the blood have already been diminished, pointing towards timing as a critical role for viral detection and the necessity of EMB as a diagnostic tool for potential antiviral or anti-inflammatory therapeutic interventions.