

“Idiopathic” cardiomyopathy in children is highly associated with infectious genome presence in the myocardium

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Introduction: Viral infections are major causes of myocarditis, sometimes progressing to myocardial dysfunction, but incidentally found cardiomyopathy (CM) is usually deemed “idiopathic”. The purpose of this study was to test endomyocardial biopsies (EMBs) and blood from “idiopathic” CM children for infectious genomes using polymerase chain reaction (PCR) to assess the role of cardiac infections in the pathogenesis of CM.

Methods: Blood and EMBs were obtained for PCR and histologic analysis from 26 consecutive paediatric patients with unexplained CM aged 8.5 ± 7.3 years. Workup included ECG, ECHO or MRI with decreased EF present in only 58% of patients. PCR and reverse transcription-PCR were performed to detect the genomic sequences of enterovirus (EV), adenovirus (ADV), cytomegalovirus (CMV), herpes simplex virus (HSV), Epstein-Barr virus (EBV), human herpesvirus (HHV), parvovirus B19 (PVB19), influenza A and B viruses, chlamydia and mycoplasma.

Results: Infectious genomes could be amplified from EMBs of 24/26 (92.3%) of patients: EV in 2 (7.6%), CMV in 2 (7.6%), HSV in 7 (26.9%), EBV in 4 (15.4%), HHV in 4 (15.4%), PVB19 in 3 (11.5%), chlamydia in 12 (46.2%) and mycoplasma in 1 (3.8%) including 9 (34.6%) cases with multiple agents. Blood PCR was positive in 17/26 (65.4%) patients, in 13 with exactly the same and in 4 with fewer agents. No case had active or borderline myocarditis according to the Dallas classification. Patients with positive EMBs were treated with respective antibiotic or antiviral agents. Over 1.2 ± 0.9 years follow-up, 2 patients died from heart failure, 1 received left ventricular assist device and the rest are clinically stable. Repeat testing was performed in 7 patients 0.4 ± 0.3 years after the initial evaluation, with PCR showing persistence of infectious genomes in EMB in all 7 patients (fewer agents in 3) and in blood in only 1 patient.

Conclusions: Infectious genomes were very frequently detected in EMBs of patients with unexplained CM without active or borderline myocarditis irrespective of the presence of systolic LV dysfunction, suggesting that infectious myocardial involvement, often with multiple agents, may be important in the pathogenesis of CM. Further research is needed concerning possible antiinfectious treatment and management of these patients.