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Clinical presentation and early predictors for poor outcomes in pediatric myocarditis. A retrospective study.

Rodriguez-Gonzalez M., Sanchez-Codez M.I., Lubian-Gutierrez M., Castellano-Martinez A.
Pediatric Cardiology Department of Puerta del Mar University Hospital. Cádiz (Spain)

Introduction: Myocarditis is an important cause of morbidity and mortality in children. The initial diagnosis of myocarditis is usually based on clinical presentation, which is widely variable and in most of cases unspecific. An early recognition is essential in order to monitor and start supportive treatment.

Methods: Retrospective cross-sectional single-group study from January 2008 to November 2017, including children <18 year-old diagnosed as myocarditis. Poor outcome was defined as the occurrence of any of the following: death, heart transplant, persistent left ventricular systolic dysfunction or dilation at hospital discharge (early poor outcome) or after one year of follow-up (late poor outcome). We analysed different clinical features and diagnostic test findings in order to provide some diagnostic clues for myocarditis. Multivariable stepwise logistic regression analysis was performed to determine independent predictor factors of poor early or late outcome.

Results: A total of 42 patients met inclusion criteria. Chest pain (40%) was the most common specific cardiac symptom. Respiratory tract symptoms (38%), shortness of breath (35%), gastrointestinal tract symptoms (33%), and fever (31%) were the most common non-cardiac initial complaints. Signs of heart failure such as heart murmur (26%), systolic hypotension (24%), gallop rhythm (20%) or hepatomegaly (20%) were less prevalent. Up to 43% of patients presented an early poor outcome and 16% presented a late poor outcome.
An initial left ventricular ejection fraction (LVEF) <30% remained the only significant predictor for early (OR (CI95%)=21(2-456); p=0.027) and late (OR (CI95%)=8 (0.56-135); p=0.047) poor outcome. LVEF correlated well with age (r=0.51; p=0.005), days from initial symptoms (r=-0.31; p=0.045), and NT-proBNP levels (r=0.66; p<0.001). NT-proBNP presented a high diagnostic accuracy for LVEF < 30% on echocardiography, with an area under curve of 0.931 (CI95% 0.858-0.995; p<0.001). The best cut-off point was 2000 pg/ml, with a sensitivity of 90%, specificity of 81%, positive predictive value of 60% and negative predictive value of 96%.

Conclusion: Diagnosis of myocarditis in children is challenging. The presence of LVEF<30% on echocardiography at admission resulted the major predictor for poor outcomes. Younger ages, a prolonged course of the disease and NT-proBNP levels could help to identify these high-risk patients.