

Procedural safety, hemodynamic and histological findings of myocardial biopsy in children

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Background: Cardiac catheterization with endomyocardial biopsy is an invasive diagnostic technique for children with suspected cardiomyopathy and myocarditis.

Aim: To study the procedural safety, hemodynamic and histologic findings of cardiac catheterization with myocardial biopsy in children treated for cardiomyopathy and myocarditis.

Methods: All children with myocardial biopsy between 2003 and 2011 in our institution were analyzed regarding hemodynamics, periprocedural outcome (defined as inotropic support and catheter-related complications), and histological findings.

Results: Twenty-six patients at (mean±SD) age of 8.5±5.4 years with a transvenous endomyocardial biopsy in the right ventricle were included. There were no major catheter-related complications such as myocardial perforation, hemopericardium, or need of mechanical resuscitation. All cardiac catheterizations were performed under general anaesthesia with sevoflurane/atracurium. Inotropic support including use of milrinone/adrenaline had to be established during the procedure in 7 (27%), increased in 2 (7.7%), continued in 2 (7.7%) patients. Hemodynamic findings under inotropic support revealed elevated enddiastolic left ventricular pressure (20±7 mmHg), left atrial pressure (18±6 mmHg), borderline pulmonary artery pressure (24±7 mmHg), normal pulmonary vascular resistance (2.3±1.8 Woods units/m²), and low cardiac index (3.1±0.8 ml/min/m²). Left ventricular biplane ejection fraction was reduced with 39±20% (performed in 10 patients). Coronary artery angiography ruled out coronary artery disease in all patients. Histological findings of myocardial biopsy revealed dilated cardiomyopathy in 3, myocarditis in 16 (8 chronic, 6 borderline, and 2 acute) of all cases. Other etiologies were identified in four (failing Fontan, restrictive myocarditis, anthracycline-induced cardiomyopathy, endocardfibroelastosis). No pathologic changes were found in three samples. Myocardial and serological viral polymerase chain reaction (PCR) was positive in six and in eleven patients, respectively, with predominance of human herpes virus type 6 and 7, and parvovirus B 19. Conclusions: Cardiac catheterization with myocardial biopsy can be performed safely, although increased inotropic support during procedure may become necessary. Hemodynamic invasive data and histologic findings complete clinical diagnosis of myocarditis and cardiomyopathy, and give important information stratifying further clinical management.