

The role of endomyocardial biopsy in establishing the etiology of progressive ventricular arrhythmias in children

*Vasichkina E.S., Mitrofanova L.B., Tatarsky R.B, Pervunina T.M, Lebedev D.S.
Federal Almazov North-West Medical Research Centre, Saint-Petersburg, Russia*

Objective: This study aimed to assess the results of endomyocardial biopsy (EMB) to establish the etiology of progressive ventricular arrhythmias in children.

Methods: We studied 16 consecutive patients with progressive ventricular arrhythmias who underwent EMB.

The inclusion criteria were: age less than 18 year old, progressive ventricular arrhythmias, structurally normal heart or changes in a structure of the heart initially diagnosed as Arrhythmia induced cardiomyopathy (AIC).

Before EMB patients underwent a complete history, physical examination, laboratory studies (including thyroid function, CK, CK-MB, LDG, Troponin I, proBNP), echocardiography, ECG, Treadmill test and Holter monitoring. Cardiac MRI and genetic test were performed according to indications and physician's decision.

In overall 74 biopsies were performed in 16 children. A histological analysis followed the Dallas Criteria, immunohistochemistry, polymerase chain reaction (PCR) used for interpretation of EMB. Samples were obtained from >1 region of the right ventricle.

Results: The mean age of patient population was 13,6±2,94 year (from 7 to 17 year old). 56,25% (9/16) patients had sustained or non-sustained VT, 43,75% (7/16) – frequent ventricular ectopy (PVCs).

Patients had palpitation (43,7%), syncope (31,2%), weakness and reduction of physical tolerance (31,2%). Mild dilatation of at least one of the heart chambers (left/right ventricles, left atrium) was reported in 50% (8/16) patients at baseline.

In 2 (10,5%) patients arrhythmogenic right ventricular dysplasia (ARVD) was diagnosed by EMB, MRI and genetic test (PKP2).

Myocarditis was diagnosed based on histological and immunohistological analyses in 50% (8/16) of patients. PCR was positive for viral genome in four of them (2- Parvovirus B19, 1 - Enterovirus, 1 - Ebstein-Barr virus). Five of these patients had active myocarditis.

Conclusion: EMB is a valuable method for the diagnosis of the etiology of progressive ventricular arrhythmias in children. Half of pediatric patients with progressive ventricular arrhythmias had an unsuspected myocarditis according to the results of EMB.