Comparative analysis of transmural dispersion and atrial natriuretic peptide (ANP) concentration in plasma as risk marker of arrhythmogenic dysfunction in children with hypertrophic cardiomyopathy

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Objective: Assessment of ANP interrelation in plasma with the index of transmural dispersion of repolarization at treadmill testing in children with HCM.

Patients and Methods
46 children (aged 14 to 17 years) with left ventricular hypertrophy were examined. The control group consisted of 20 healthy children. Functional diagnostics and laboratory tests included ECG, Holter, echocardiography, treadmill test with transmural dispersion (TDR) (normal 69-92ms) assessment. All the patients underwent laboratory evaluation of ANP concentration in plasma.

The Results
HCM was diagnosed in 26 of 46 patients (mean age 15,7 ± 2,2 years). The patients were divided into two subgroups. The 1st subgroup (n = 11) - patients with asymmetrical obstructive LVMH (wall thickness > 20 mm). The 2nd subgroup (n = 15) - patients with nonobstructive symmetric LVMH (wall thickness <20 mm).

In the 1st subgroup (n = 11) the level of ANP was higher than normal (1,92nmol / l) in 7 of 11 patients (64%). In the 2nd subgroup (n = 15) increased values of ANP were observed in 5 of 15 patients (33%). In the 1st subgroup ANP concentration was 47% higher than in the 2nd one (3,34nmol / l of 1,57nmol / l). In the control group ANP concentration corresponded to the norm (0,89nmol / l) in 100% of patients. When comparing the average values of ANP in all the groups significant differences of these parameters (p = 0,002) were found.

In the 3rd minute of a cool down period the episodes of TDR elongation were recorded in 7 of 11 subjects (64%) in the 1st subgroup and in 11 of 15 patients (7.3%) in the 2nd subgroup. TDR values and ANP in the control group corresponded to normal levels during the whole study period. The correlation coefficient between TDR and ANP values was equal to 0,46 (p = 0,002).

The conclusions
Significantly positive correlation between concentration level of ANP and TDR value was revealed at the 3rd minute of a cool down period during stress testing, which allows to identify prognostic risk of life-threatening arrhythmias and sudden cardiac death in patients with HCM.