Abstract: P1020

Echocardiographic assessment of treating patients with chronic heart failure with mid-range ejection fraction by external counterpulsation

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Introduction: The new 2016 European Society of Cardiology Heart Failure (HF) Guidelines propose a new HF classification includes a new HF category with mid-range EF (HFmrEF, LVEF 40-49%). The influence of the external counterpulsation on patients with HFmrEF is unclear.

Purpose: The aim of this study was to evaluate the echocardiographic parameters of patients with HFmrEF treated with external counterpulsation (ECP).

Methods: We studied 57 patients with stable CAD undergoing one course of external counterpulsation therapy. We categorize the patients into two groups: HFmrEF (EF 40-49%) and control group (EF>50%). Echocardiographic assessment included evaluation of the chamber size and ejection fraction by 2D and Doppler measurements.

Results: The mean age of the patients was 63.07 ± 7.44 years (43 (75.4%) men and 14 (24.6%) women). The mean age of the patients included in the HFmrEF group and control group was 64.13 ± 6.86 and 62.69 ± 7.67 years (p=0.45). There were 13 men and 2 women in the HFmrEF group and 30 men and 12 women in the control group (p=0.24). All patients treated with one course of the ECP therapy (33.87 ± 5.93 and 35.02 ± 4.57 sessions, p = 0.7714). The mean EF before treatment was 44.23 ± 3.21% and 62.18 ± 6.78% (p<0.0001). After the treatment by the ECP the mean EF in both group were 52.13 ± 7.01% and 65.73 ± 6.63% respectively (p<0.0001). When comparing the dynamics of the EF and stroke volume between two groups following data obtained: for EF: +7.90 ± 7.44 and +3.55 ± 4.27% (p=0.0487); for stroke volume: +6.35 ± 13.08 and +2.51 ± 8.03 ml (p=0.0176). After the end of treatment 9 out of 15 patients in the HFmrEF group (60%) had an EF more than 50%. When comparing the dynamics of changes in the echocardiographic parameters in the HFmrEF group and the control group, non-statistically changes observed in the following parameters: end-diastolic diameter of the LV (-0.06 ± 0.18 and -0.06 ± 0.31 sm, p=0.3504), end-diastolic volume of the LV (-0.69 ± 18.43 and -0.27 ± 12.07 ml, p=0.9783), left atrial volume (-3.73 ± 16.13 and -5.19 ± 14.79 ml, p=1.0), the ratio between early mitral inflow velocity and mitral annular early diastolic velocity (E/e', -0.65 ± 3.89 and -0.40 ± 2.74, p=0.9566).

Conclusion: ECP treatment was associated with an increase in EF and stroke volume in patients with HFmrEF.