ORAL PRESENTATIONS

New insights into right-ventricular function

5 December 2003, 8:30 to 10:00
Location: Room 4

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Is the function of right ventricle important for mortality of chronic heart failure patients?
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Aim: To find, if the right ventricle (RV) is an important factor in mortality of patients with chronic heart failure.

Study group: 155 patients with chronic heart failure, NYHA II-IV. All patients had LV dysfunction, ejection fraction (EF) of LV below 40%. Group A (101 patients who were alive) and group B (54 patients who died or had to be transplanted), mean age 51.8 ± 8.8 years, male 129, female 26, coronary artery disease 86, dilative cardiomyopathy 69.

Methods: Echocardiography with measurement of LV diameters, volumes and ejection fraction, tissue Doppler imaging (TDI) of tricuspid annular motion with measurement of systolic velocity (Sa), early (Ea) and late (Aa) diastolic velocities, right heart catheterization with evaluation of mean pulmonary artery pressure (MPAP), pulmonary capillary wedge pressure (PCWP), central venous pressure (CVP), pulmonary vascular resistance (PVR) and radionuclid ventriculography with measurement of RV ejection fraction (EF).

Level of tumor necrosis factor (TNF) alpha was measured by ELISA method.

Results: Patients in group B did not differ from group A in age 50.4 ± 9.9 vs 52.5 ±6.2 years. There were no differences in LV EF 23.6 ± 6.0 vs 23.8 ±5.8%. Patients who died or were transplanted had lower EF RV 30.8 ± 8.3 vs 44.1 ±12.1%, p < 0.00007. They also showed lower Sa (that indirectly reflects the RV function) 10.2 ± 2.3 vs 11.1±2.3 cm/s, p = 0.03. The patients who died or were transplanted had higher values of pressures during right heart catheterization: CVP 8.1±5.1 vs 6.05±5.1 mmHg, p<0.02, MPAP 33.1±11.4 vs 25.1±11.6 mHg, p<0.0001, PCWP 24.2±9.1 vs 17.0±9.4 mm Hg, p <0.00007.

Group B patients had significantly elevated TNF alpha level: 146±205 vs 54±90 pg/ml, p<0.02.

Conclusion: The patients who died or were transplanted had more pronounced right ventricular dysfunction than those who survived. They also had higher level of TNF alpha. The function of right ventricle is an important factor that influences the survival of patients with chronic heart failure.

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Prognostic importance of the right ventricular function assessed by Doppler tissue imaging.
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The aim of this study was to assess whether the peak systolic and diastolic tricuspid annular velocities as indicators of the right ventricular systolic and diastolic function are of prognostic importance in patients with symptomatic heart failure.

Methods: The study included 139 consecutive patients with symptomatic heart failure. Their mean left ventricular (LV) ejection fraction was 24%. All patients underwent clinical and laboratory examination, standard echocardiography completed by the Doppler tissue imaging of the tricuspid annular motion, and the right-sided heart catheterization. They were followed up for cardiac-related death and non-fatal cardiac events including the need for implantation of a cardioverter-defibrillator and hospitalization for heart failure. The median follow-up was 11 months (range, 1-48 months).

Results: There were 17 cardiac-related deaths and 23 non-fatal cardiac events. The multivariate stepwise Cox regression modelling revealed three effective predictors for both survival and event-free survival: aetiology of heart failure, LV end-diastolic diameter (LVEDD), and the peak systolic tricuspid annular velocity (Sa). Patients with Sa <10.8 cm/s exhibited worse survival (P = 0.048) and event-free survival (P < 0.001) compared with those having Sa greater than or equal to 10.8 cm/s. Risk values of Sa (<10.8 cm/s) and the LVEDD (>70 mm) were found to be of additive simultaneous influence leading to a very poor prognosis (P < 0.01).

Conclusion: The peak systolic tricuspid annular velocity represents a significant independent predictor of survival and event-free survival in patients with symptomatic heart failure. Its combination with the left ventricular end-diastolic diameter provides a very powerful tool for patient risk stratification.