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Right and left ventricular functions in patients with asthma.

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Objectives: The study was performed to estimate right and left ventricular (RV and LV) functions in patients with asthma.

Methods: 65 patients with asthma and 33 healthy volunteers were investigated with echocardiography method. All patients were undergone to pulmonary tests (PT) to estimate presence and degree of ventilation disorders. According to PT results and clinical investigations all patients were divided into the two groups. The first group (I) consisted of 24 patients with asthma III step, while the second (II) group consisted of 41 patients with asthma IV step. LV ejection fraction (EF), RV diastolic dimension, LV and RV PE/PA ratios were assessed. Pulmonary vascular resistance (PVR) was calculated with conventional method, pulmonary artery pressure (PAP) and PVR were increased. These alterations deteriorated RV systolic function wasn’t altered in patients with asthma in compare with healthy volunteers. LV EF was 56.96±5.09% in I group and 58.42±6.02% in II group (compare with 59.81±7.70% in control, p<0.05). In patients with asthma LV diastolic filling wasn’t changed, but LV PE/PA ratio in the II group was significantly less than in control and in I group (I 1.05±0.21 vs II 1.07±0.30, p<0.01, II group vs. 1.41±0.37 in control, p<0.01). RV diastolic function was significantly altered. There were 51 (78.46%) patients with altered relaxation compare with 3 persons (9.09%) in control (p<0.001). All patients with IV step asthma had RV diastolic dysfunction whereas only 10 patients in the I group had it (7.62±17.65, p<0.001). RV PE/PA ratio in the I group was 1.05±0.25 (p<0.05 vs. control), in the II group it was 0.57±0.13 (p<0.01 in compare with the I group and with control), 1.27±0.30 in control. Patients with IV step asthma had higher degree of PAP than patients of the I group and control (I 26.32±4.67cmH2O, II 40.08±1.19 cmH2O, control 27.45±8.42 cmH2O, p<0.001 between I and II groups, p<0.001 between II and control). PVR was significantly increased in patients with asthma comparing with control (488.41±166.78 cmH2O * cm*sec-2 vs 295.06±59.43 *cm*sec-2, p<0.001). RV dysfunction in I group was significantly less in than in the II one (330.45±106.63 *cm*sec-2 vs 560.88±93.30 *cm*sec-2, accordingly (p<0.001)).

Conclusions: LV alterations in patients with asthma were minimal and included LV diastolic dysfunction in patients with IV step asthma. Patients with asthma have RV diastolic dysfunction and RV PVR were increased. These alterations deteriorated as asthma step increased.

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Severity of obstructive sleep apnea syndrome is associated with right heart function.

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Introduction: Obstructive sleep apnea syndrome (OSAS) may coexist in patients with heart failure. Echocardiographic assessment of right ventricle (RV) morphology and function is technically difficult, and data on right heart alterations and function in patients with obstructive sleep apnoea syndrome (OSAS) are inconsistent. We sought to investigate left and right heart function in OSAS patients by echocardiography and assess the relationship with the severity of OSAS.

Methods: Twenty patients (MF: 10/4) with OSAS, and 14 age matched controls were investigated. Patient were divided into 2 subgroups according to pulmonary artery sистolic pressure: 25 patients (16 male and 9 female, age 60.2±2.5) with pulmonary hypertension (group1) and 23 (13 male and 10 female, age 57.4±4.1) normal subjects were studied (group 2). Methods: 48 patients with severe COPD were studied. Patient were divided into 2 subgroups according to pulmonary artery sистolic pressure: 25 patients (16 male and 9 female, age 60.2±2.5) with pulmonary hypertension (group1) and 23 (13 male and 10 female, age 57.4±4.1) normal subjects were studied (group 2).

Results: Patients in group 1 had higher tricuspid peak A velocity (58.9±3 cm/s > 54.7±7.63±8.7 cm/s), lower tricuspid E velocity (31.1±3 < 59.8±28.8 < 57.2±7.2 cm/s), longer isovolumic relaxation time (VRT 103.2±5.4 > 87.10±76.9±9.9 ms), higher mtrateral A wave (70.4±31.3–56.1±3.6 < 54.4±3 cm/s), lower mtrateral E wave(61.9±2.8±6.5 < 18.8 < 70.4±3 cm/s) than group 1 and 2. There was no significant difference between left ventricular diastolic filling parameters between group 1 and 2.3 (P value group 1vs 2<0.001, group 2vs <0.001)

Conclusion: Patients with COPD and pulmonary systolic hypertension have left and right ventricular diastolic dysfunction. However, patients with COPD and normal pulmonary artery pressure have normal left and right ventricular diastolic function. In patients with COPD the development of pulmonary hypertension leads to the dysfunction of both ventricles because they share a common ventricular septum and pericardium.

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Assessment of right ventricular function in patients with chronic obstructive pulmonary disease using standard and tissue Doppler echocardiography of the tricuspid annulus.

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Purpose: Aim of this study was to investigate whether evaluation of the tricuspid annulus function, using Tissue Doppler Echocardiography (TDE), provides additional information to standard echocardiography for the determination of right ventricular (RV) function in patients (pts) with Chronic Obstructive Pulmonary Disease (COPD).

Methods: 22 pts with COPD aged 67±10 years were enrolled in this study. We measured the following parameters: a) From an apical four chamber view the ratio RV (long diameter)/RV (short diameter) as an index of RV size, b) Diameter of the interior vena cava (IVC) and its respiratory variation, c) RV systolic pressure (RVP, from the tricuspid regurgitation CW Doppler signal, d) Tricuspid annulus systolic and diastolic velocities (S,E,A), e)Qo (the interval between the beginning of the QRS complex onset and the a wave). The echocardiographic variables were determined using TDE. Statistical analysis of our data was performed using Pearson Correlation.

Results: All pts exhibited an E/A < 1 at the tissue Doppler signal of the tricuspid annulus. We also found the following positive and negative correlations: A) Positive: 1. E/A with FEV1 (r: 0.622, p: 0.002), 2. E/A with FEV1 (r: 0.722, p: 0.002), 3. E/A with FEV1/FVC (r: 0.588, p: 0.004), 4. A/E with PO2 (r: 0.512, p: 0.015), 5. RVSP with PCO2 (r: 0.620, p: 0.002). B) Negative: 1. E/A with PCO2 (r: -0.439, p: 0.041), 2. ZS with the ratio RV (long diameter)/RV (short diameter) (r: -0.626, p: 0.002), 3. Inspiratory variation of IVC with A (r: -0.596, p: 0.003).

Conclusions: Both RV systolic and diastolic function, as were estimated using TDE, seem to be impaired in pts with COPD. RV dysfunction was found to be well correlated with established respiratory variables.

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