

Abstract

Background: Cor-pulmonale complicates 2-6/1000 of patients with chronic obstructive pulmonary disease (COPD). The early diagnosis of RV dysfunction 2ndry to pulmonary hypertension can reduce morbidity & mortality.

Aim of Work: The objective of our study is to assess the usefulness of tissue Doppler imaging (TDI) in evaluation of RV function in patients with COPD in comparison to first pass radionuclide angiography (FPRNA) which is the gold standard method. Another aim is to determine the relationship between lateral tricuspid annulus TDI parameters and PASP as estimated by continuous wave Doppler in patients with COPD.

Patients and Methods: Thirty patients with COPD diagnosed by history, clinical examination, CXR, laboratory findings (ABG, CBC), 12-lead ECG, TDI (to measure MPI, Sm, SmVTI, Em/Am), FPRNA (to measure RV EF)

Results: Based on the nuclear study (FPRNA) our 30 pts divided to 17pts (56.7%) with RVEF > 45% (55.2±1.4) and 13 pts (43.3%) with RVEF < 45% (37.7±6.2). From the 1st 17 pts, 15 pts showed by TDI, MPI < 0.7 (0.56±0.09) and Sm ≥ 12 cm/s (15.3±1.7 cm/s) and 2 pts showed MPI ≥ 0.7 Sm < 12 cm/s. From the 13 pts with RVEF < 45% (37.7±6.2) 12 pts exhibited by TTI MPI ≥ 0.7 and Sm < 12cm/s (mean 0.83±0.05 and 9.7±1.07 cm/s respectively) and one pt exhibited normal MPI and Sm. Based on the relationship between PASP measured by continuous Doppler tricuspid valve and lateral tricuspid annular velocities Sm (13.7±2.9cm/s), SmVTI (2.2±0.7), Em/Am (0.6±0.2). The correlation was r = -0.61 for Sm, r = -0.72 for SmVTI and r = -0.60 for Em/Am. The results of TDI and FPRNA in evaluation of RV function compared to clinical signs of cor-pulmonale were P-value 0.001 and 0.01 respectively. Also in our study we compared between diameter of RV measured by conventional echocardiography and result of TDI in evaluation of RV function where p-value = 0.01.

Conclusion: There is significant correlation between TDI and FPRNA in the ability to detect RV dysfunction in COPD pts by a sensitivity 92.3%, specificity 88.2% and P-value = 0.001. There is a good negative correlation between PSAP measured by continuous Doppler and later tricuspid annular velocity with P-value 0.001. There is a significant correlation between result of TDI and FPRNA in evaluation of RV function compared to clinical data signs of cor-pulmonale where P-value = 0.001 and 0.01 respectively. Also there is a significant correlation between results of TDI in evaluation of RV function and diameter of RV measured by conventional echocardiography where P-value = 0.01. TDI is considered a new, easy, bedside and less expensive technique in assessment of RVEF.

Key Words: Tissue Doppler Imaging, Peak Myocardial Systolic Velocities, Myocardial Performing Index, First Pass radionuclide Angiography, Chronic Obstructive Pulmonary Disease and Cor-Pulmonale.