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<b>Thesis Title</b>	<b>ASSESSMENT OF LEFT AND RIGHT VENTRICULAR FUNCTIONS BY MYOCARDIAL PERFORMANCE INDEX IN PATIENTS WITH CHRONIC PULMONARY DISEASE</b>			
<b>Year</b>	<i>2015</i>			
<b>Abstract</b>	<p style="text-align: center;"><b>Development of right ventricular hypertrophy and eventual right side heart failure is common in patients with Chronic obstructive pulmonary disease (COPD). However, some disturbance in left ventricular (LV) function has been observed among such patients.</b></p> <p><b>The co-existence between chronic obstructive pulmonary disease (COPD) and heart failure has been previously described. However, the co-existence between COPD and subclinical LV dysfunction, without the presence of heart failure symptoms, is less well understood.</b></p> <p><b>The aim of the study:</b>  <b>The aim of this study was to evaluate global function of the LV and RV in patients with chronic obstructive pulmonary disease (COPD) with or without pulmonary hypertension (PH) by using myocardial performance index (MPI) and find out the correlation between echocardiographic findings and severity of COPD.</b></p> <p><b>Patients and methods:</b>  <b>Sixty patients with COPD without additional cardiac diseases [30 patients with COPD without PH (group 2), and 30 patients with COPD with PH (group 3)] and 30 age and sex-matched healthy subjects (group 1) were enrolled into the study. All patients underwent clinical evaluation, spirometry, electrocardiography and standard and tissue Doppler echocardiography. Various echocardiographic parameters of LV and RV functions were compared with indices of pulmonary function test and pulmonary</b></p>			

arterial pressure. RV myocardial performance index (RVMPI) and LVMPI were obtained by pulsed wave Doppler tissue.

**Results:**

RVMPI was higher in both group 2 ( $0.57 \pm 0.11$ ) and group 3 ( $0.96 \pm 0.05$ ) than group 1 ( $0.42 \pm 0.043$ ) ( $P < .001$ ), and was higher for group 3 than in group 2 ( $P < .001$ ). LVMPI was higher for group 3 ( $0.7 \pm 0.083$ ) than in both group 1 ( $0.5 \pm 0.034$ ) and group 2 ( $0.56 \pm 0.037$ ) ( $P < .001$ ).

For patients with COPD, LVMPI was positively correlated with age, heart rate, pulmonary arterial systolic pressure and RVMPI and negatively correlated with tricuspid annular plane systolic excursion and forced expiratory volume in 1 second. In multiple linear regression analysis ( $R=0.674$ ), LVMPI was independently associated with forced expiratory volume in 1 second (FEV1) (Beta =1.133,  $P = 0.007$ ), pulmonary arterial systolic pressure (Beta=-0.758,  $P=0.128$ ), and RVMPI (Beta =1.436,  $p=0.009$ ).

LV diastolic function parameters (A, E/A, and deceleration time of E) were impaired for groups 2 and 3 compared with group 1. Mitral early diastolic and late diastolic annular velocities ratio (Em/Am), were significantly lowest in COPD patients with PH( $0.77 \pm 0.066$ ), and the isovolumetric relaxation time (IVRT) was significantly longer in group 3( $105.43 \pm 4.21$ ms) and group 2( $102.27 \pm 4.45$ ms) in relation to control group( $71.2 \pm 5.51$ ms).

RV diastolic function, E/A ratio was higher in the control subjects compared with the patient groups. The tricuspid inflow velocities ratio (E/A) was significantly lowest value in COPD patients with PH ( $0.84 \pm 0.04$ ) and the isovolumetric relaxation time (IVRT) was significantly longer in group 3( $98.87 \pm 8.41$ ms) and group 2( $77.5 \pm 4.57$ ms) in relation to control group ( $75.37 \pm 5.2$ ).

LV end-diastolic diameter was significantly lower for group 3 ( $40 \pm 2.665$ ) than group 1( $46.2 \pm 2.295$ ) and group 2( $44.2 \pm 3.367$ ). LV mitral valve annular velocity (S') was lowest in group 3 ( $9.64 \pm 0.92$ ). However, conventional systolic function parameters and IVSd were not different among the groups. Systolic and diastolic RV diameters were higher and RV fractional shortening was lower for group 3 than the other two groups. TAPSE was significantly lower for group 3( $16.07 \pm 3.54$ ) compared with group 1( $21.7 \pm 2.71$ ) and group 2 ( $20.83 \pm 2.69$ ), but differences between groups 1 and 2 was not statistically significant.

**Conclusion:**

Both LV systolic and diastolic functions are impaired in COPD, especially in patients with PH. This impairment is independently associated with pulmonary arterial systolic pressure, RVMPI, and FEV1. Left and right ventricular diastolic function and LV and RV global function are affected in COPD patients especially with

	<p><b>progression of the disease. COPD patients with pulmonary hypertension are more liable to LV and RV diastolic and global dysfunction than normal pulmonary pressure COPD patients. Doppler tissue echocardiography is a better tool in the assessment of LV, RV function.</b></p>
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