

European Respiratory Society Annual Congress 2013

Abstract Number: 3213

Publication Number: P1862

Abstract Group: 1.1. Clinical Problems

Keyword 1: COPD - mechanism **Keyword 2:** Exercise **Keyword 3:** COPD - exacerbations

Title: Heart rate recovery after 6-min walk test predicts acute exacerbation in COPD

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Body: INTRODUCTION: Abnormalities of autonomic function have been reported in patients with chronic obstructive pulmonary disease (COPD). Our objectives were to identify determinants of abnormal heart rate recovery at 1 min (HRR1) after completion a 6-min walk test (6MWT) and to establish whether abnormal HRR1 predicts acute exacerbations (AECOPD). METHODS: 110 COPD patients (mean age (SD) 65 (8) years; mean FEV1 (SD) 49 (17) %predicted) were prospectively recruited in a multi-centre study. HRR1 after 6MWT was evaluated as the difference between heart rate at the end of the test and after one minute into the recovery period (HRR1). We used lineal and logistic regression to identify predictors of HRR1 and AECOPD respectively. The best HRR1cut-off point to predict AECOPD was selected using the Receiver Operating Characteristics (ROC) curves. RESULTS: Gender, FEV1 (%predicted) and TLco (%predicted) were independent determinants of HRR1 after 6MWT ($r^2 = 0.82$, $p = 0.001$). After evaluating potential covariates, HRR1 was the optimal predictor of AECOPD (odds ratio [OR], 0.91 per beat of recovery; 95% confidence interval [CI], 0.85 to 0.97; $p = 0.02$). HRR1 after 6MWT equal to 14 beats was the best predictive values for AECOPD (AUC, 0.71 [CI] 0.60 to 0.80; $p = 0.0001$). Subjects with a HRR1 less than 14 beats more likely to have an exacerbation during next year (for HRR1, $p=0.004$ [log-rank test]). CONCLUSIONS:

HRR1 after 6MWT could be a potential predictor of AECOPD in COPD patients. Research is needed to examine the mechanisms linked between HRR and acute exacerbations in these patients.