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Title: Association of heart rate recovery after exercise test with exercise capacity in patients with stable COPD

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Body: Objective To study the relationship between heart rate recovery(HRR)after exercise test and disease severity in patients with COPD, and to assess its impact on the exercise capacity of COPD patients. Methods Arterial blood gas analysis (ABG),Pulmonary lung function test(PFT) and Cardiopulmonary exercise testing(CPET) were tested in 60 patients with stable COPD and 50 healthy volunteers, based on HRR,COPD patients were divided into HRR normal group and abnormal HRR group. Results exercise capacity (peak oxygen uptake as percentage of predicted value, peak $\text{VO}_2\%$ pred) ,peak HR and HRR significantly lower than controls in patients with COPD, restingHR significantly higher than controls. Compared with heart rate recovery normal group, $\text{FEV}_1\%$ pred and exercise capacity decreased more significantly in abnormal heart rate recovery group. HRR was significant associated with $\text{FEV}_1\%$ pred and peak VO_2 ($r=0.42, p<0.001$ and $r=0.52, p<0.001$), multivariate regression analysis shows HRR and $\text{FEV}_1\%$ pred can be used as independent predictors of the exercise capacity in patients with COPD. Conclusions In patients with COPD the degree of disease severity is associated with HRR, HRR and $\text{FEV}_1\%$ pred are independently associated with exercise capacity in patients with COPD.