

Comparisons between Different Indices of Exercise Performance in Absolute and Normalized Values in Patients with Chronic Obstructive Pulmonary Diseases

Li-Ying Wang Meng-Yueh Chien Huei-Dong Wu*

Background and Purpose: Exercise is often impaired in patients with chronic obstructive pulmonary disease (COPD). Various test protocols have been used to assess exercise performance in these patients. The purpose of this study was to examine the correlations between different indices of exercise performance in absolute and normalized values measured during 6-minute walk test (6MWT) and graded exercise test (GXT), and their relationship with disease severity in patients with moderate-to-severe COPD. **Methods:** Sixteen male patients with COPD (mean \pm standard error of forced expiratory volume in one second (FEV_1) = $45.3 \pm 3.3\%$ predicted) underwent 6MWT and GXT. Main exercise performance indices were distance walked in 6-minute (6MWD), 6-minute walk work ($6MWD \times W$) that was calculated as 6MWD multiplied by the body weight, peak oxygen uptake (VO_{2peak}), and peak power output (W_{peak}). These values were expressed as absolute values and as percentage of the predicted value, adjusted for age, race and gender. **Results:** The disease severity (i.e. % predicted) correlated significantly with absolute 6MWD ($r=0.55$), $6MWD \times W$ ($r=0.61$), and absolute and normalized VO_{2peak} ($r=0.71$ and 0.62 , respectively), but not with absolute and normalized W_{peak} ($r=0.36$ and 0.35 , respectively). Body mass index and fat free mass index correlated with all exercise performance indices measured during GXT and 6MWT, except for the 6MWD whether normalized or not. The value of $6MWD \times W$ had stronger relations with those exercise performance indices measured during the GXT than 6MWD. **Conclusions:** In patients with COPD, disease severity was best correlated with VO_{2peak} in absolute value. There were good correlations between different indices of exercise performance measured during 6MWT and GXT and the normalization did affect these correlations. (FJPT 2004;29(1):21-30)

Key Words: Chronic obstructive pulmonary disease, Six-minute walk test, Graded exercise test

School and Graduate Institute of Physical Therapy, College of Medicine, National Taiwan University, Taipei, Taiwan.

* Department of Internal Medicine, College of Medicine, National Taiwan University, Taipei, Taiwan.

Correspondence to: Li-Ying Wang, School and Graduate Institute of Physical Therapy, National Taiwan University, 7 Chung-Shan S. Rd.,
TEL: (02)23123456-6683 E-mail: liying@ntu.edu.tw

Received: Aug 18, 2003 Accepted: Oct 6, 2003