Locus of Symptom Limitation and Exercise Response to Bronchodilation in Chronic Obstructive Pulmonary Disease

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Background: We previously reported that the occurrence of contractile fatigue of the quadriceps during exercise in patients with COPD reduced the likelihood of acute bronchodilation to improve the endurance time to constant work rate exercise. The purpose of the present study was to assess whether the perception of dyspnea and leg fatigue during exercise could be used to predict the exercise response to acute bronchodilation in this population.

Methods: Sixty-eight patients with COPD performed either two constant work-rate cycling exercises or two endurance shuttle walking tests. These tests were preceded by nebulization of placebo or 500 mg ipratropium bromide. Changes in FEV₁ and in the endurance time with bronchodilation were measured. The changes in quadriceps twitch force after exercise were evaluated. In addition, we assessed dyspnea and perception of leg fatigue on Borg scale as well as the locus of exercise limitation (dyspnea, leg fatigue, or both).

Results: The locus of symptom limitation was useful to predict the exercise response to bronchodilation; patients stopping exercise because of leg fatigue or due to a combination of dyspnea/leg fatigue showed a smaller improvement in endurance time to constant work rate exercise with bronchodilation compared with those stopping because of dyspnea. Subjective and objective evidences of fatigue were related: patients who stopped exercising because of leg fatigue

showed a larger fall in quadriceps twitch force compared to patients who stopped for dyspnea.

Conclusion: The assessment of the locus of symptom limitation during constant work rate exercise is useful to predict the improvement in endurance time following acute bronchodilation in patients with COPD.

Individualized Intervention Model Aiming to Permanently Change Life Habits which Have an Impact on Modifiable Risk Factors.

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Background: A great challenge for clinicians working in a rehabilitation or prevention setting is to succeed in getting their clients to be physically active and to make them change their life habits. Five years ago at Centre de Réadaptation Lucie Bruneau, an interdisciplinary rehabilitation team took that challenge. This team is specialized in stroke rehabilitation and, in the last 5 yr, it has noticed a decline in the health condition, quality of life and social participation of its patients. Here are some statistics that illustrate the situation: 57% are < 49 yr old, 24% have 3 modifiable risk factors, another 24% have four or more and 18% have five; 35% have associated heart, vascular problems or diseases; for most of them, there's a 20% chance of having another stroke.

Methods: From these observations, an innovative concept of intervention was born. It is a part of the rehabilitation process and is based on research in a variety of fields: the transtheoric model of Prochaska and DiClemente, the person centered neurodynamic approach; the ecological, psycho-biological (affordance) and pedagogical approaches. The team systematically identifies the risk factors in an individualized intervention plan which is based on the "handicap production process" model. From the start to the end of the rehabilitation program and according to his needs, the patient will be brought to understand, adopt and integrate new life habits in the following spheres: food, smoking, and physical activity.

Results: This global responsabilization optimizes and strengthens their long term commitment. Concerning

physical activity, results obtained from a pilot study show us that 70% of our patients maintain their level three months after their discharge.

Conclusion: This type of intervention could be used in other type of settings (rehabilitation or prevention): hospital, school, CLSC's and community centers.

An Incremental Shuttle Walk Test to Estimate Maximal Aerobic Functional Capacity

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Background: The goal of the present study was to compare the maximum walking speed and peak oxygen consumption (VO₂ peak) obtained during the 6-min walk test (6 MWT) and an incremental shuttle walking test (ISWT) in a trained older population.

Methods: A total of 22 older adults (16 female and 6 male) with a group mean age of 70±5.8 yr (range 58 to 79) completed the 6 MWT and ISWT within a 2 wk period. Heart rate (HR) and VO₂ peak were measured during each test with a portable metabolic cart (Cosmed, K4B2). The VO₂ peak, the maximum walking speed and the total distance walked measured during both tests (6 MWT and ISWT) were compared.

Results: A total of 110 recordings for the VO₂ peak were obtained and analyzed. Strong correlations were found for the VO₂ peak and the walking speed ($r=0.91$ and $r=0.89$, respectively, for 6 MWT and ISWT). VO₂ peak values obtained with the ISWT were significantly greater ($P<0.05$) than with the 6 MWT (21.6 ± 5.3 vs 18.9 ml/kgmin ± 4.5 , respectively). There was no difference between sexes. In addition, the maximum heart rate as predicted from age during the ISWT was reached by all participants while it was not during the 6 MWT.

Conclusion: Thus, the ISWT appears to a better tool to assess the maximal aerobic functional capacity in older healthy adults based on the higher VO₂ peak values obtained in comparison to the 6 MWT.

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Systemic Changes in Patients with Chronic Obstructive Pulmonary Disease (COPD): Two Years of Follow-up

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Background: There is a lack of information concerning the natural evolution of the systemic manifestations related to COPD. The aim of this study was to observe the evolution of the systemic manifestations (muscle wasting, inflammation) related to COPD over a two-year period and to assess their relationships with clinical outcomes (exacerbations and worsening in quality of life) in a longitudinal prospective cohort.

Methods: Forty-eight patients with COPD (FEV₁: 42 ± 14 % predicted, lean mass: 49 ± 10 kg, 6-min walking distance: 422 ± 112 m, total SGRQ score: 45 ± 17) were included. Baseline and annual follow-up for body composition by DEXA scan, blood cytokines (CRP, IL-6), arterial blood gases, pulmonary function tests and quality of life were obtained. The number of acute exacerbations was recorded.

Results: Overall, FEV₁, lean body mass, 6-min walking distance and blood inflammatory markers did not change over the two years. During this time, the SGRQ scores decreased by 4 ± 11 points ($P=0.021$) and 2.7 ± 2.4 exacerbations per patient were observed. There was no relationship between the changes in physiological measures and the fall in SGRQ or the exacerbation rate. A loss in lean body mass $> 3\%$ was observed in 11 (23%) patients but this was not associated with any adverse clinical outcomes nor with fur-