80% of the peak workrate achieved during progressive cycle ergometry. Ventilatory parameters were monitored breath-by-breath, while inspiratory capacity maneuvers were obtained every other minute during constant-load cycling. Quadriceps twitch force was measured with magnetic stimulation of the femoral nerve before and after the test. Muscle fatigue was defined as a post-exercise reduction in quadriceps twitch force of more than 15% of the resting value.

Results: Forty patients (65%) developed muscle fatigue after constant-load cycling. No significant differences were found between fatiguers and non-fatiguers with respect to age, body mass index, resting lung function, peak oxygen consumption, and endurance time to constant-load exercise. Change in inspiratory capacity from rest to end-exercise (DIC) was similar between both subgroups (DIC: 0.56 ± 0.32 L vs 0.56 ± 0.47 L for fatiguers and non-fatiguers respectively, $P=0.99$).

Conclusion: Susceptibility to muscle fatigue could not be predicted by exercise duration or by the degree of dynamic hyperinflation in patients with COPD.

2. CONCURRENT SESSION (FRIDAY PM)

Interpreting Changes in Endurance Shuttle Walking Performance

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Rationale: The endurance shuttle walk has recently been shown to be highly responsive to both bronchodilation and pulmonary rehabilitation. The degree to which changes in endurance shuttle walking performance are perceptible to patients is unknown.

Objective: To evaluate the relationship between objective and subjective measures of change in endurance shuttle walking performance.

Methods: 129 comparison points were obtained from 69 patients with COPD (FEV_1 : $47 \pm 16\%$) who completed two or more endurance shuttle walking tests as part of a bronchodilation study. Patients were asked to rate their performance of the day in comparison to their previous performance on a 7-point scale ranging from -3 (large deterioration) to +3 (large improvement). These ratings were related to changes in walking distance and endurance time, expressed both as delta and percent change.

Results: Patient ratings of change were significantly correlated with delta walking distance ($r=0.44$, $P < 0.001$), delta endurance time ($r=0.46$, $P < 0.001$), percent change in walking distance ($r=0.54$, $P < 0.001$), and percent change in endurance time ($r=0.55$, $P < 0.001$). Deteriorations in walking performance were perceived in 34% of cases, while improvements were detected in 81% of cases.

Conclusion: Changes in endurance shuttle walking performance, especially improvements, are well perceived by patients with COPD. From this set of data, it should be possible to identify the smallest change in walking performance with a high likelihood of being perceived by the patients (MCID).

Aerobic Training with Hyperoxia in Patients with Mild/Severe Brain Injury

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Background: Previous studies have shown that aerobic training can induce physiological benefits for brain injured patients. However these benefits seem to be limited. Compared with untrained subjects who follow the same training program, patients with brain injury have a reduced exercise capacity and have difficulty in reaching a high intensity exercise level. A possible alternative to help these patients is to conduct the training in hyperoxia (O₂ supply). Studies with untrained subjects have shown that training in hyperoxia enhances the fitness performance. Thus, the purpose of this study was to measure the effects of an aerobic training in hyperoxia with brain-injured patients.

Methods: Twelve patients were randomly assigned to either one of two aerobic training protocols: A) 100% O₂; B) 20.9% O₂ (room air). In both protocols training was on stationary bicycle, 2 sessions per week over 10 weeks. Each session lasted 25 min and was composed of 6 intervals with intensity ranging from 60 to 85% of the max HR. The first interesting result is that all patients were able to reach and sustain the 80-85% level of exercise. To measure the working capacity during the training, we recorded the workload (watts) reached at the third interval (80-85% of the HRmax) of each session.

Results: A difference ($P < 0.05$) in the power output on the ergocycle was observed between the pre test (measured on the first week) and the post test (measured on the 6th week) for subjects trained in hyperoxia but no difference was observed for subjects trained in normoxia. However, no difference was ob-

served in the 6 min walk test for all subjects before and after the aerobic training. There was no difference in oxygen consumption (submaximal test 85% HRmax) between the pre and post tests in both groups of subjects ($P = 0.18$). Nonetheless, subjects trained in hyperoxia showed a 16% average increase in their VO₂ (85% HRmax) compared with subjects in normoxia who had a 4% average decrease.

Conclusion: Our results show that oxygen supply seems to accelerate the benefits of the aerobic training with brain injured patients. We believe that it is the combination of the training protocol (i.e. intervals) and the oxygen addition that induced the early benefits observed.

Chronic Obstructive Pulmonary Disease (COPD) as a Risk Factor for Glucose Metabolism Perturbation and Insulin Resistance.

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Background: High body mass index (BMI) is associated with better survival in COPD. However, increased BMI and especially waist circumference is associated with elevated pro-inflammatory systemic markers that might contribute to glucose intolerance. On the other hand, COPD is a chronic inflammatory disease that could be a risk factor for impaired glucose metabolism. The objective of this study was to compare the prevalence of glucose intolerance in COPD patients and control subjects with high waist circumference.

Methods: Eleven patients with COPD (age: 68 ± 8 yr mean $\pm$ SD; FEV₁: $49 \pm 17\%$ pred) and 10 control subjects (C) (age: 63 ± 6 yr) underwent a 75g oral glucose tolerance test (OGTT). All subjects had a waist circumference > 102 cm and no previous history of diabetes. Height and weight were measured and each subject underwent dual-energy X-ray absorptiometry (DEXA) to evaluate fat-free mass (FFM) and fat mass (FM) and abdominal tomography to evaluate visceral fat (VF). Blood samples were taken to measure