Methods: Six sedentary men, treated with diet and/or a hypoglycemic agent performed four exercise sessions at 60% of their VO2 peak, in the fasted state or 2 hours after a standardized breakfast, with and without BB (Atenolol 100 mg id for five consecutive days). Blood samples were assayed during the resting period, at 15-minutes intervals during the exercise session and the recovery period.

Results: A reduction of blood glucose levels was observed following the exercise session performed in the postabsorptive state (41% and 37% reduction with and without BB treatment respectively; \( P < 0.01 \)). One hour of exercise performed in the fasted state had minimal impact on glucose and insulin levels, with or without BB. BB treatment was not associated with increased baseline blood glucose or insulin levels in the fasted or the postabsorptive situation.

Conclusion: These results suggest that the nutritional status has a more important impact on plasma glucose and insulin modulation than short-term use of BB per se.

Aerobic Capacity of Elderly People after a Short 6-Week Intermittent Exercise Programme

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Background: One of the most debilitating effects of advancing age is the progressive decline in aerobic exercise capacity. To prevent this decrease, exercise prescription has been proved to be effective in compensating for the age-associated decline in maximal oxygen capacity.

Methods: 27 healthy sedentary elderly men (10) and women (17) aged 67±7 yr, were involved in a tailored 6-week intermittent exercise programme, with 30 min cycling per session, 3 times a week. One session alternated 4 min at a workload corresponding to the ventilatory threshold (called “bases”) and 1 min to a charge corresponding to 90% of the maximum tolerated power of the subjects (called “peaks”). This was repeated 6 times during one session. To determine these charges, all subjects underwent a 1-minute-step maximal incremental exercise test to find out their maximal tolerated power, peak oxygen consumption (VO2peak), maximal heart rate, and maximal lactate. A second maximal incremental exercise test was performed after the programme, to compare the different parameters.

Results: For the whole group, maximal tolerated power increased from 113±8 watts to 13±9 watts \((P<0.001)\), VO2 peak increased from 19.8±0.9 ml·kg\(^{-1}\)·min\(^{-1}\) to 22.2 ±0.9 ml·kg\(^{-1}\)·min\(^{-1}\) \((P=0.002)\), maximal heart rate (143±4 vs 144±4 beats·min\(^{-1}\)) and maximal lactate (5.4±0.3 vs 5.7±0.3 mmol·L\(^{-1}\)) did not change. VO2 at ventilatory threshold increased from 950±57 ml·min\(^{-1}\) to 1095±69 ml·min\(^{-1}\) \((P=0.007)\), and the corresponding power increased from 65±5 watts to 82±6 watts \((P<0.001)\).

Conclusions: Even after a short time training programme (6 weeks), we observed a significant improvement in aerobic capacity, and especially in sub-maximal workloads, which represented, for these subjects, their daily-life capacity.

Susceptibility to Muscle Fatigue and Lung Mechanics in Chronic Obstructive Pulmonary Disease

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Background: Contractile fatigue of the quadriceps occurs in a significant proportion of patients with COPD after constant-load cycling exercise. Dynamic hyperinflation, by altering cardiac output during exercise, could contribute to fatigue susceptibility in this population. The purpose of this study was to compare operational lung volumes during constant workrate exercise between COPD patients who do and those who do not develop contractile fatigue of the quadriceps (fatiguers vs non-fatiguers).

Methods: Sixty-two patients with COPD (FEV1: 46±16%) completed a constant-load cycling test at
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±0.32L vs 0.56±0.47L 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 (FEV1: 47±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.