236. The best abstracts in rehabilitation and chronic care 2011 (sponsored by Nutricia Advanced Medical Nutrition)

1886 Late-breaking abstract: Wii Fit™-step is a suitable exercise in rehabilitation programs in patients with COPD: A feasibility study Tanguy Marquette1, Fabien Lassus2, Olivier Castagna2, Daniel D’Amore2, Bruno Escarguel2, Louis Marquette1, UMR CNRS 6233 - Institut des Sciences du Mouvement, Université de la Méditerranée, Marseille, France; 3Service de Pneumologie, Centre Hospitalier Intercommunal de Toulon - La Seyneur, Toulon, France

Patient with COPD can be involved in pulmonary rehabilitation program, by using cycle ergometer exercises. They often give up with this exercise either during the program or when they have to manage it themselves.

We found many similarities between these exercises. No difference was obtained regarding the time to exhaustion, the occurrence of Vth1 and VO2max. VO2max value and oxygen uptake at Vth1 were similar, and maximal HR at the end of exercise, or HR at Vth1 and at VO2max were not different during the two tests. Vth1 was obtained at 58±11% of the maximal HR on cycle ergometer and at 66±6% for on Wii Fit, with a RER being below 1, i.e. mainly aerobic exercise. Finally a majority of patients had preferred the Wii Fit-step (50%) or had no specific preference (31%). Therefore we conclude that this exergame is a suitable tool for further chronic rehabilitation programs in patients with COPD, inducing similar cardiopulmonary workload, and it could increase both the patients’ involvement and their motivation.

1887 Obstructive lung disease is associated with increased abdominal visceral fat and elevated systemic adipocytokines

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Background: The source of systemic inflammation in clinically stable Obstructive Lung Disease (OLD) is unknown. Visceral adipose tissue (VAT) is related to systemic inflammation. We hypothesized that in OLD subjects a redistribution of fat mass towards more VAT is present and associates with increased levels of systemic adipocytokines.

Methods: From the Health ABC Study (n=3075), pulmonary function, VAT quantification (by abdominal CT), body composition (by whole-body DXA) and systemic adipocytokine levels were available from n=2139 participants. From this sample, VAT area was determined as the sum of the VAT area in all abdominal sections. VAT/total fat mass ratio was calculated as VAT area divided by total fat mass.

Compared to controls, cases had greater VAT area (143±77 vs 123±59 cm2, p<0.001) and elevated interleukin (IL)-6 (2.16 [1.52-3.34] vs 1.75 [1.20-2.69] pg/ml, p<0.001), Plasminogen Activator Inhibitor-1 (PAI-1) [22 [12-37] vs 18 [11-31] ng/ml, p=0.008) and adiponectin [11 [7-16] vs 10 [6-15] μg/ml, p=0.037]. Neither whole-body nor appendicular/trunk fat mass were different between cases and controls (p<0.05).

Conclusion: This study shows that OLD patients have greater VAT and elevated systemic IL-6, PAI-1 and adiponectin levels compared to non-OLD controls matched for sex, age, race, BMI and smoking. Greater VAT in OLD may reflect a disturbed metabolic regulation contributing to systemic pathology. Performed within Ti Pharma project T1-201.

1888 Does protein supplementation enhance the effects of resistance training in patients with COPD? Linzy Houchen1,2, Manoj Menon1, Samantha Harrison1, Carolyn Sandland1, Michael Morgan3,5, Sally Singh1,2, Michael Steiner1, 1Institute for Lung Health, Glenfield Hospital, Leicester, United Kingdom; 2Faculty of Health & Life Sciences, Coventry University, Coventry, United Kingdom; 3Respiratory Medicine, University of Leicester, Leicester, United Kingdom

Introduction: Protein supplementation (PS) & resistance training (RT) enhances muscle growth in healthy elderly subjects. Its role in patients with COPD is unknown.

Hypothesis: Adding PS to RT will yield greater increases in function than RT alone.

Method: We conducted a randomised, double-blind, placebo controlled trial. 59 patients [mean (SD) age 67.9 (9.1)yr, BMI 26.7 (2.7), FEV1 67.2 (17.6)% pred, 32% smokers, pack years 38 [IQR 28-50]] were compared with 57 controls, given placebo throughout the trial.

PS vs Placebo: 8 week RT program included: 1 day/week on an isometric dynamometer (Cybex: speed=180°/sec). Participants received PS or placebo after each RT session. Isometric & isokinetic quadriceps strength at 60°/sec [Cybex: Newton-meters (Nm)], thigh lean mass [DEXA: grams (g)] & incremental cycle performance [peak work (W) & peak oxygen uptake (VO2; ml/kg/min)] were assessed at baseline & 8 weeks.

Results: Table1 shows mean change from baseline and between group differences for all outcomes. There were significant within group changes in all outcomes in both groups (except peak VO2 in the PS group). There were no significant differences between groups.

<table>
<thead>
<tr>
<th>PS (n=30)</th>
<th>Placebo (n=29)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean Difference</strong></td>
<td><strong>Mean Difference</strong></td>
</tr>
<tr>
<td>Isometric strength</td>
<td>19.8 (12.2 to 27.0)**</td>
</tr>
<tr>
<td>Isokinetic strength</td>
<td>17.7 (10.0 to 25.2)**</td>
</tr>
<tr>
<td>Thigh lean mass</td>
<td>180.1 (102.2 to 258.0)**</td>
</tr>
<tr>
<td>Peak cycle work</td>
<td>9.9 (4.2 to 15.7)*</td>
</tr>
<tr>
<td>Peak VO2</td>
<td>0.5 (–1.9 to 2.8)</td>
</tr>
</tbody>
</table>

None of the above changes were statistically significant.

Conclusion: There were significant improvements in quadriceps strength, thigh mass & whole-body cycle work following RT. The addition of PS did not augment the functional benefits of RT.

1889 Stability of life-sustaining treatment preferences of patients with advanced chronic organ failure

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Objectives: We aimed to investigate 1-year stability of preferences regarding cardiopulmonary resuscitation (CPR) and mechanical ventilation (MV) of patients with advanced COPD, chronic heart failure (CHF) or chronic renal failure (CRF), and to identify clinical determinants associated with these preferences.

Methods: 265 clinically stable outpatients with COPD, CHF or CRF were visited at baseline and every 4 months for 1 year, to assess preferences for CPR and MV. Generalized estimating equations were used to study the association between preferences and several potential predictors including co-morbidities, hospital admissions, health status (EQ5D), care dependency (CDS), mobility, depression (HADS-D) and anxiety (HADS-A).

Results: 78% of the patients completed 1-yr follow-up (64% men; mean (SD) age: 67 (13) yrs). CPR and MV preferences changed in 38% of the patients during follow-up. The odds ratio (95% CI) combining the time and factor effects show

status and pack years for the n=2139 subjects, and 3:1 propensity score matching was performed successfully matching n=729 non-OLD controls to the cases.

Results: Compared to controls, cases had greater VAT area (143±77 vs 123±59 cm2, p<0.001) and elevated interleukin (IL)-6 (2.16 [1.52-3.34] vs 1.75 [1.20-2.69] pg/ml, p<0.001), Plasminogen Activator Inhibitor-1 (PAI-1) [22 [12-37] vs 18 [11-31] ng/ml, p=0.008) and adiponectin [11 [7-16] vs 10 [6-15] μg/ml, p=0.037]. Neither whole-body nor appendicular/trunk fat mass were different between cases and controls (p<0.05).

Conclusion: This study shows that OLD patients have greater VAT and elevated systemic IL-6, PAI-1 and adiponectin levels compared to non-OLD controls matched for sex, age, race, BMI and smoking. Greater VAT in OLD may reflect a disturbed metabolic regulation contributing to systemic pathology. Performed within Ti Pharma project T1-201.
Effects of resistance training during hospitalization in the systemic inflammation, functional capacity and muscle strength in COPD patients

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Background: Resistance training (RT) during hospitalization improves skeletal muscle strength; however its effect on systemic inflammation and to modify the level of activity remains unknown.

Objective: Our aim was to evaluate the effect of RT in the systemic inflammation and functional capacity in COPD patients during and after hospitalization.

Methods: Twenty nine out 102 patients hospitalized due to COPD exacerbation were randomly assigned to either Control (CG) or RT (RTG) groups. They were evaluated on the 2nd day of hospitalization, at hospital discharge and after 30 days. It was evaluated systemic inflammatory markers (TNF-α, RCP, IL-1β, IL-12p70, IL-6, IL-8, IL-10), level of physical activity, health-related quality of life (HRQL), and upper and lower limbs muscle strength.

Results: Patients from RTG showed an improvement in the lower limb muscle strength, in the six-minute walking test (6MWT) and in all domains of HRQL, more than CG. More than CG showed a reduction in the lower limb muscle mass and 6MWT, and a worsening in the HRQL. No difference between groups was observed in the systemic inflammatory markers analyzed during hospitalization and after 30 days of hospital discharge. In addition, most patients from both groups remained physically inactive (70%) in the hospital and at home.

Conclusion: Our results suggest that resistance training during hospitalization improves lower limbs muscle strength, health-related quality of life and physical capacity; however does not change either systemic inflammatory levels or physical activity during or after hospital discharge.

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Effects and feasibility of different types of endurance training in patients with end stage lung disease before lung transplantation

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Objective: Aim of this study was to compare the effects and the feasibility of continuous moderate endurance training (CT) versus high-intensity interval training (IT) in patients with end-stage COPD before lung transplantation during a specialized 3-week in-patient pulmonary rehabilitation programme.

Methods: 60 lung transplant candidates (age: 53.5±27.89m from 289.5±27.89m to 239.5±27.89m) performed up to 15 training sessions within 3 weeks randomised to either CT or IT training. CT was applied for 12 weeks. Whey protein, a protein complex derived from milk, has been shown to have a strong anti-inflammatory effect in vitro. Program consisted of respiratory muscle (RM) stretch gymnastics, RM training, breathing retraining, wall mobility, and chair exercise. Lung functions, six-minute walking distance (6MWD), chronic respiratory questionnaire (CRQ) and inflammatory biomarkers (hsCRP, TNFα, IL-6, IL-8) were measured during hospitalization and after 12 weeks.

Results: Both groups showed significant improvements in 6MWD. The CT group increased by 35.7±42.21m from baseline 312.7±48.2m and the IT group by 35.4±27.89m from 289.5±108.7m. Despite an increase in cycling time, patients in both groups showed decreased symptoms of dyspnoea during exercise. The overall dyspnoea over the whole training period was significantly improved (p=0.018) higher in IT (BORG 7.1) than in CT (BORG 6.2). Furthermore, significantly more (p=0.001) more unintended interruptions during exercise were observed in CT (28.3%) than in IT (7.2).

Conclusion: Our study shows, that CT as well as IT can significantly improve exercise capacity in pre-LTx patients. IT seems to be better tolerated, expressed by a lower grade of dyspnoea and significantly better feasibility of the exercise protocol.

Vitamin D status in patients with COPD who participate in pulmonary rehabilitation (PR): Characteristics and effects of PR

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Vitamin D deficiency is common in COPD patients, however no study has evaluated the influence of vitamin D status on effects of pulmonary rehabilitation.

We studied 311 patients, who participated in a 7-week outpatient pulmonary rehabilitation programme (PR). Vitamin D status was assessed at entry and examined for association with patients’ characteristics, drop out from PR, and effect on endurance shuttle walk time (ESWT).

Vitamin D level ≤25nM was seen in 61 (19.6%) of the patients. They were significantly younger, were more frequently on long-term oxygen therapy, had higher BMI and FeV1 and had worse quality of life score, tended to have lower FeV1/FVC predicted value and more frequently to be current smokers. They had a 3-times higher risk of drop out from the PR programme (p=0.003) compared to patients with normal vitamin D status and a poorer improvement in ESWT (p=0.05).