Interval exercise training in cystic fibrosis - Effects on maximal and submaximal exercise capacity in severely affected adults

W. Gruber1,2, K.M. Braumann1, R. Benecke3. 1University of Hamburg, Institute for Sports and Exercise Medicine, Hamburg, Germany; 2Gruber Sports Science and Sports Education, Stahnsdorf, Germany; 3Phillips University Marburg, Medicine, Training & Health, Marburg, Germany

Objectives: To examine the effects of a high interval training (IT) on power (P) and oxygen uptake (VO2) at peak performance (peak) and ventilatory threshold (VT) in severely affected CF patients unable to participate in a standard exercise program (SEP), and to compare corresponding IT effects with those of SEP.

Methods: 43 CF patients (FEV1 \(\leq 40\%\) pred.) underwent cardio-pulmonary exercise testing. 20 patients (FEV1 25.5 ± 7.5%; pred; SpO2 < 90% at rest or P lower than 0.3W/kg) unable to participate in SEP were allocated to 5x20min per week IT under supplemental oxygen via nasal cannula. The remaining 23 patients (FEV1 31.6 ± 4.2%; p < 0.05) did 5x45min per week SEP.

Results: Lung function remained unchanged in both groups and main effects (p < 0.05) of increases in body (2.5 ± 3.3%), fat free mass (5.5 ± 3.1), and PVAT (21.3 ± 15.3%), VO2VAT (18.5 ± 9.2%), and Ppeak (18.6 ± 13.5) and VO2peak (16.7 ± 13.5) were found. Partial effects were confirmed (p < 0.05) in VO2VAT (21.8 ± 13.5) after IT and Ppeak (23.9 ± 18.3) after SEP.

Conclusion: IT imposed as safe and effective in CF patients who are unable to participate in SEP. Compared to SEP, IT improved submaximal exercise capacity to a greater extent than SEP whereas responsiveness of maximal exercise capacity was higher in the SEP. This seems to indicate a specific potential of IT for positive peripheral muscular adaptations in spite of diminishing potential of pulmonary improvement. IT may offer an alternative, effective and safe training regime with a greater potential of training effects helping to cope better with the physical demands of daily activities than SEP.

Physical activity, energy expenditure and quality of life in CF adults receiving intravenous antibiotics at home and in hospital

H. Khiroya1, R. Pound2, U. Qureshi2, A. Turner2, N.F. Edward1. 1Heart of England Foundation Trust, West Midlands Adult CF Centre, Birmingham, United Kingdom; 2University of Birmingham, Birmingham, United Kingdom

Objectives: Theoretical benefits of delivering intravenous (IV) antibiotics at home compared to in hospital include improved quality of life (QoL) and maintaining physical activity. Regular exercise and habitual physical activity are generally considered beneficial for people with CF in improving QoL and slowing lung function decline, but physical activity in patients receiving IV antibiotics for pulmonary exacerbations is not well researched. The purpose of this prospective observational cohort study was to directly compare physical activity, QoL and nutritional outcomes in patients receiving IV antibiotics in hospital and at home.

Methods: 45 CF adults chronically infected with P. aeruginosa requiring IV antibiotics for pulmonary exacerbations were recruited. Location of treatment (home or hospital) was based on clinical criteria, ability to deliver home IV antibiotics and patient preference. During the first and last 3 days of IV antibiotics, subjects were asked to wear ActiGraph\textsuperscript{®} activity monitors and complete food diaries. Subjects were also asked to complete the modified shuttle test, CFQ-R and habitual activity estimation scale (HAES) questionnaires at the start and end of therapy.

Conclusion: Activity monitor and HAES data demonstrated no significant difference between the physical activity of subjects receiving IV antibiotics in hospital and at home, with both groups spending the majority of time being sedentary. Subjects at home reported a significantly greater increase in the CFQ-R respiratory domain over the course of antibiotics, but no other differences in clinical outcomes were found.