

incremental test (T) of short duration (8–12 min, TS) (Buchfuhrer et al., 1983). In normal-weight individuals, it has been suggested that also longer T (~25–30 min, TL), with 5–6 min steps duration (typically used to assess fat oxidation and metabolic fitness in obese individuals), elicits valid maximal aerobic fitness values (Midgley et al. 2008). However, this has not been investigated in severe obese (SO) individuals. Therefore, this study aimed to compare the determination of aerobic fitness with TS and TL in SO men. **Methods:** Eleven SO men (40.1 ± 4.0 yr; 41.9 ± 2.7 kg·m⁻²) performed on a cycle-ergometer a TS (40-W warm-up with 20-W·min⁻¹ increments) to assess the peak oxygen uptake ($\dot{V}O_{2peak,TS}$), maximal heart rate (HR_{max,TS}) and peak power output (PPOTS). Afterward, they performed a TL (20% PPOTS warm-up with 10% PPOTS·5min⁻¹ increments) to evaluate $\dot{V}O_{2peak,TL}$, HR_{max,TL} and PPOTL. **Results:** TL was 2.6 significantly longer than TS ($P \leq 0.001$). There were no significant differences in $\dot{V}O_{2peak}$ (TS: 3.08 ± 0.34 l·min⁻¹; TL: 2.98 ± 0.46 l·min⁻¹; $P=0.31$) and HR_{max} (TS: 165.0 ± 14.4 bpm; TL: 164.8 ± 16.2 bpm; $P=0.95$) between the two tests. $\dot{V}O_{2peak,TS}$ was significantly correlated with $\dot{V}O_{2peak,TL}$ ($r = 0.75$; $P=0.008$) as well as HR_{max,TS} with HR_{max,LS} ($r = 0.94$; $P \leq 0.001$). PPOTS was significantly higher than PPOTL (+15%; $P \leq 0.001$). However, two PPOs were significantly correlated ($r = 0.91$; $P \leq 0.001$) attesting a systematic underestimation of PPO in TL. **Conclusion:** TL is an appropriate tool to assess aerobic fitness and to prescribe exercise training in SO men.

T2:PO.002

Strength gains can be achieved through an active lifestyle promotion intervention in obese adolescents

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Introduction: In obesity, fat mass increase is associated with functional ability impairment and maximal strength reduction. The purpose of the present study was to analyze lower limb peak torque (PT) changes after a 6-month intervention aiming active lifestyle promotion in obese adolescents.

Methods: 21 adolescents (14.62 ± 1.24 yr; 32.50 ± 3.64 kg/m²), 16 girls, participated in this study. Baseline and 6-month data were collected assessing thigh PT (Biodex System 3 – Biodex Corp., Shirley, NY, USA), and body composition (dual-energy X-ray absorptiometry – Hologic-QDR Hologic, Inc., Bedford, MA, USA). Descriptive analysis was performed, along with normality test (Kolmogorov-Smirnov test), paired samples t-test, and Pearson correlation.

Results: An increase in PT was observed during knee extension at 60° ($\Delta=32.53$ Nm; $p=.001$) and 180° ($\Delta=16.13$ Nm; $p=.002$). No significant changes were found in knee flexion ($p > .05$). Significant associations were found, at baseline and at 6-month, between strength performance at 60° and lower body lean body mass ($r=.692$; $p=.001$ and $r=.791$; $p<.001$, respectively) and lower body percent fat mass ($r=-.807$; $p<.001$ and $r=-.652$; $p=.001$, respectively).

Conclusion: An intervention planned to promote an active lifestyle in obese adolescents was successful in the development of knee extension maximal strength, which can be elicited through walking and activities of daily living, thus increasing adolescent's functionality. The absence of improvement regarding knee flexion maximal strength might be explained by the need of specific exercise strategies to be achieved. Even among obese adolescents, strength performance presents a positive association with lean mass, as well as a negative association with fat mass.

Abstracts

T2:PO.003

Significant impact of eccentric endurance exercise on liver enzymes in overweight and obese individuals

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Introduction: Elevated liver enzymes are highly prevalent in overweight and obese patients, reflect the presence of non-alcoholic fatty liver disease, and are associated with an increased risk of diabetes and cardiovascular events. Liver enzymes can be lowered by physical exercise, but many overweight patients are not willing or not able to engage in strenuous exercise regimens. Eccentric endurance exercise is less strenuous than concentric exercise but its effects on liver enzymes are unknown.

Methods: We allocated 42 overweight and obese sedentary individuals to an exercise intervention program, consisting of hiking downwards a pre-defined route over two months. For the opposite way, a cable car was used where compliance was recorded electronically. The difference in altitude was 540 metres; the distance was covered three to five times a week. A matched group of 12 individuals served as a control group. Metabolic profiles were obtained at baseline and after the two months period.

Results: Compared to baseline, 8 weeks of eccentric endurance exercise significantly lowered serum alanine-aminotransferase (ALT; 36 ± 23 vs. 31 ± 18 U/l; $p < 0.001$), the ALT/ aspartate-aminotransferase (AST)-ratio (1.22 ± 0.41 vs. 1.02 ± 0.33 ; $p < 0.001$), and serum gamma-glutamyl-transferase (56 ± 98 vs. 44 ± 65 U/l; $p = 0.005$), whereas these parameters did not change significantly in the control group ($p = 0.261$, $p = 0.272$, and $p = 0.644$, respectively). Eccentric endurance exercise was well tolerated and there were no serious adverse events.

Conclusion: Eccentric exercise is a promising new exercise modality which significantly lowers liver enzymes in overweight and obese individuals and therefore is of interest as a therapeutic intervention in non-alcoholic fatty liver disease patients.

T2:PO.004

Adipose tissue impairment as a central dysmetabolism inducing effect triggered by persistent organic pollutants

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Introduction: The role of environmental toxicants with endocrine disrupting activity in the aetiology of obesity and its comorbidities has been recently highlighted. As the persistent organic pollutants (POPs) are ac-

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