

take care of all aspects of chronic disease patients. Moreover, it is very important public stakeholders to invest capitals to guarantee continuity to projects like this and to set up new ones.

P-21. Ventilatory Strategies During Different Types of Exercise in Subjects with Different Body Mass Index (BMI)

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Introduction: As is known in literature, during exercise high BMI subjects have less efficient ventilation than normal weight subjects. We assumed that the position in which the exercise takes place can have effects on ventilatory patterns in relation to the BMI. Therefore we analyzed ventilation and breathing pattern in various BMI subjects at rest and through different types of exercise.

Materials and Methods: 30 trained subjects, divided into 3 groups: A (8 male, 2 female; age 52 ± 29 , BMI 23 ± 1), B (7 male, 3 female; age 57 ± 17 , BMI 27 ± 1), C (8 male, 2 female; age 59 ± 21 , BMI 37 ± 2). Evaluation: spirometry, 6 Minutes Walking Test (6MWT), Sit & Reach (S & R), waist circumference (CW). VE monitoring (Spiropalm, COSMED) at rest and during exercise: steady load six minutes tests (Borg 4/10) of: I) Treadmill; II) Bike Recline; III) Sitting position Arm Ergometer; IV) Vertical bike; V) Upright position Arm Ergometer.

Results: Spirometry: normal. 6MWT (meters): A (478 ± 133), B (460 ± 137), C (384 ± 71). Sit & Reach A (0.3 ± 16), B (0.3 ± 8), C (-17.5 ± 9.8 ; $p < 0.005$). CA (cm): A (90.7 ± 10.4), B (102.6 ± 5.4), C (131.8 ± 16.4 ; $p < 0.005$). Ventilatory pattern (Tidal Volume = TV; Respiratory rate = RR): during exercise expressed as a percentage variation ($\Delta\%$) compared to basel. Sum of five exercises (I, II, IV and V): A ($\Delta VE\% 206 \pm 62$, $\Delta VC\% 178 \pm 49$, $\Delta RR\% 115 \pm 24$), B ($\Delta VE\% 205 \pm 73$, $\Delta VC\% 169 \pm 49$, $\Delta RR\% 121 \pm 21$), C ($\Delta VE\% 207 \pm 70$, $\Delta VC\% 159 \pm 45$, $\Delta RR\% 131 \pm 32$). Sum of sitting position exercises (II and III): A ($\Delta VE\% 209 \pm 63$, $\Delta VC\% 166 \pm 42\%$, $\Delta RR\% 125 \pm 29$), B ($\Delta VE\% 209 \pm 81$, $\Delta VC\% 172 \pm 52$, $\Delta RR\% 120 \pm 20$), C ($\Delta VE\% 208 \pm 82$, $\Delta VC\% 159 \pm 49$, $\Delta RR\% 130 \pm 28$). Sum of standing position exercises (IV and V): A ($\Delta VE\% 198 \pm 62$, $\Delta VC\% 163 \pm 44$, $\Delta RR\% 121 \pm 19$), B ($\Delta VE\% 201 \pm 75$, $\Delta VC\% 168 \pm 52$, $\Delta RR\% 119 \pm 20$), C ($\Delta VE\% 211 \pm 60$, $\Delta VC\% 166 \pm 39$, $\Delta RR\% 127 \pm 23$).

Conclusion: As expected, patients with a BMI > 35 have higher CA and perform less well, they have limitations in exercise capacity and flexibility. The main result is in the difference of the ventilatory pattern adopted: during the exercise high BMI subjects have a VE increase more on charge of the FR than the VC (=VE less efficient) mostly when the exercise is done in a sitting position. These considerations may help manage exercise programs in subjects at risk of drop out whether the programs are not customized having regard of their limitations, to introduce the exercise in the daily routine and achieve a more active lifestyle.

P-22. A Tailored Physical Activity Intervention for Hospitalized Onco-Hematology Patients

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Introduction: The therapy of hematological malignancies persists for a long time and involves in various complications. The main consequences of chemotherapy are fatigue and forced bed rest, due to immunodeficiency secondary to the treatment that, in turn, also contributes to in impairment of physical efficiency. Physical activity and structure exercise programs can prevent this weakening through the improvement of aerobic capacity and muscle strength, thus this investigation aimed to determine the beneficial role of exercise in the maintenance of the physical function in onco-hematology inpatients.

Material and Methods: The study included 15 patients, who were administered a tailored exercise protocol during their hospitalization. Intervention was mainly focused for the development of strength and flexibility; exercise sessions were directly performed in the patients' own hospital room. Exercise program was supervised by an Exercise Specialist and driven by audio-video support. Intervention group was compared with control group that consisted of 12 patients, which remained physically inactive for their hospitalization.

Results: The intervention group did not show significant decreases during hospitalization period. Significant changes were found in flexibility performance ($p < 0.05$), as well as strength and balance control appeared as enhanced. In contrast, strength had a significant decrease in the control group.

Conclusions: Results from this investigation showed that a tailored exercise protocol administered to hospitalized onco-hematology patients is feasible and efficient to promote the maintenance of their physical function. Moreover, results indicated a beneficial effect of the exercise counteracting side effects of chemotherapy treatments with a concurrent reduction in bed rest syndrome.

P-23. Functional Evaluation in Obese Patients before and after Sleeve Gastrectomy

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Introduction: Sleeve gastrectomy (SG) has become a standard of care in severe obesity, however, cardio-respiratory and muscle function after SG have only insufficiently been investigated.

Material and Methods: This is an observational study in 26 severely obese patients (BMI $45.23 \pm 5.82 \text{ kg/m}^2$) comparing physical function pre and post SG (about six months). All patients listed for SG were included, except for those with co-morbidities known to restrict physical exercise. Incremental cardiopulmonary exercise testing, standardised strength tests and balance analysis were performed.

Results: Although SG led to a huge weight loss ($-33.41 \pm 10.99 \text{ kg}$), the absolute VO_2 peak, oxygen pulse (VO_2/HR) and the oxygen uptake efficiency slope (OUES) significantly deteriorated (all $p < 0.001$). Furthermore, HR/VO_2 slope increased whereas $\text{VO}_2/\text{Exercise-time}$ slope decreased significantly (both $p < 0.001$). The HR reserve increased due to a reduction of resting HR; the HR recovery improved after SG (all $p \leq 0.01$). Parameters of ventilatory efficiency were not affected by SG. The time-constant (Tau τ) of the fundamental component of VO_2 -kinetics, reflecting oxygen metabolism at the skeletal muscle level, was found significantly worsened after SG ($p < 0.05$). However, handgrip and leg-extension strength were thereby not significantly changed. Balance parameters determined were similar pre and post SG.

Conclusions: The ventilatory and cardiac efficiency seem not to be negatively affected by SG, thus, we hypothesize that the decrease in aerobic capacity could be due to alterations in peripheral muscles. Indeed, pilot results from VO_2 -kinetics analysis seem to support the idea of a deterioration of oxidative muscle metabolism after SG.

P-24. Dynamic Balance and Explosive Strength Assessment by an Integrated Inertial Sensor in a Group of Elderly People

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Introduction: During aging process, strength and balance are subjected to a decline that, in turn, determines an unavoidable reduction in the performance during activities of daily living (ADLs) with a concurrent increase of fall risk. Nowadays, among the methods adopted to evaluate functional capacity in the elderly, integrated inertial sensors are spreading considerably, therefore the aim of this study is to report the reliability of a recently developed and not still available in commerce integrated

sensor to evaluate dynamic balance and explosive strength in a group of healthy asymptomatic elderly people.

Material and Methods: Thirty older adults were equipped with two inertial sensors, one applied on the right ankle and one on the back, fixed around the waist. Participants were asked to perform the Jump Test on the Bosco Platform and the Time Up and Go Test, in order to compare the measures acquired by the inertial sensors with the measures derived from the already validated Tests.

Results: Comparisons between measures were represented by the Bland-Altman's plots. Mean differences of measurements did not deviate from zero. Ninety-five percent of values fell within the limits of agreement.

Conclusions: Results show a clear reliability of the tool, which demonstrated a good correspondence with standard tests already used to assess explosive strength and dynamic balance. The integrated inertial sensor can represent a valid instrument in the function evaluation in the elderly.

P-25. Functional Evaluation Techniques for the Design of a Method to Identify Fatmax

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Introduction: Among the benefits of regular physical exercise, we took into account the production of lipid dependent energy. Several previous studies were designed to determine an exercise intensity that causes the maximum fat oxidation (Fatmax) through incremental tests or constant load, in which the heart rate were identified and the corresponding intensity RER closer to the maximum oxidation of lipids. Objectives of the study were testing and reliability of INCA and FATmaxwork testing software.

Materials and Methods: We enrolled 25 overweight subjects with a mean age of 50.92 ± 4.462 and BMI of 27.53 ± 1.72 kg/m². All subjects were submitted to FATmaxwork test on a treadmill, with metabolimeter portable VO₂₀₀₀, with an initial speed of 3 km/h and an increase of 1 km/h every 5 min until it reaches 20 min. The calculation of Fatmax-zone has been identified through the INCA software program that seeks to roughly estimate the values corresponding to Fatmax using a quadratic function.

Results: From the data the Fatzone was identified with an RER of $0.86\% \pm 0.89\%$, W $130\% \pm 63.6\%$ and $54.2\% \pm 4.93\%$ of HR. From the comparison of the constant-load test and INCA was a difference of $0.008\% \pm 1.92\%$ with regard to the RER and $-0.216\% \pm 1.922\%$ of the HR. Men have got Fatmax to one watt of $158.28\% \pm 71.62\%$ an RER of $0.86\% \pm 0.12\%$ to $54.58\% \pm 5.24\%$ of HR while women a Fatmax to a wattage of $115.13\% \pm 34.49\%$ with an RER of $0.87\% \pm 0.05\%$ to $56.30\% \pm 8.11\%$ of Heart rate (HR).

Discussion: The resulting data do not differ from those in the literature and demonstrate a significant reliability of INCA and Fatmaxwork test. Interesting elements in the development of this new test were the possibility of applicability to different types of subjects and safety in its development. The development of INCA and Fatmaxzone software test have responded to the requests need to date from the studies in this area: to find a good and efficient method for calculating the Fatmax.

P-26. Physical Activity and Transplant of Solid Organ. Feasibility Study: Project Vitattiva

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Introduction: The transplantation of solid organs (heart, kidney and liver) and increasingly used for the treatment of diseases in the terminal phase. Nevertheless every type of transplanted presents secondary complications, in particular a high risk of cardiovascular disease (hypertension), myopathies and psychological problems in addition to the limitations on the exercise response. Accordingly, it