

Results: Volunteers were 11 years (9-15 years), and normal pulmonary function (FVC, FEV1, FEV1/FVC > 80% predicted). The UULEX time in the test and retest was 9.5 min [8.0 - 12.0 min] vs. 9.4 min [8.2 - 12.0 min], respectively; and the number of rings in the 6PBRT was 299 [258 - 373] vs. 340 [244 - 387], respectively, $p > 0.05$. The CPET showed higher VO_2peak 22.8 (19.4 - 26) mL/kg compared to UULEX at 11.8 (10.2 - 13.6) mL/kg and to 6PBRT 11.6 (9 - 12) mL/kg, $p = 0.001$. The VEpeak was higher at CPET 31.5 (22.9 - 33.9) L/min compared to UULEX 19.7 (15.6 - 23.1) L/min and to 6PBRT 14.4 (12.2 - 19.3) L/min, $p = 0.001$. The ICC for the test and retest of UULEX was 0.93 (0.78 - 0.97) $p < 0.001$, and for 6PBRT was 0.97 (0.91 - 0.99) $p < 0.001$. Two volunteers (13%) achieving ceiling effect at UULEX, and no floor effect for any field test.

Conclusion: The UULEX and 6PBRT are feasible and reproducible field tests for upper limbs in children and adolescents, have lower metabolic demand compared to CPET. It provides an alternative to assess upper limbs pediatric population.

Implications: New upper limb test for the pediatric population.

Keywords: Field Test, Upper Limb, Children and Adolescent

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ULTRASONOGRAPHIC EVALUATION OF PULMONARY AERATION AND ITS RELATIONSHIP WITH FUNCTIONAL CAPACITY IN PATIENTS WITH CHRONIC HEART FAILURE

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Background: Early identification of pulmonary congestion is essential for optimizing clinical management and improving outcomes in individuals with heart failure (HF) enrolled in cardiovascular rehabilitation programs. However, the clinical presentation of this condition is heterogeneous, and conventional methods such as chest radiography and pulmonary auscultation have low sensitivity for early detection. In this context, lung ultrasound (LUS) has emerged as a reliable and accurate tool for assessing pulmonary aeration, enabling the early identification of congestion and the appropriate guidance of therapeutic interventions.

Objectives: To evaluate the relationship between pulmonary aeration and functional capacity in individuals with chronic HF at the beginning of a cardiovascular rehabilitation program.

Methods: This was an observational, analytical-descriptive, and cross-sectional study conducted with individuals aged 18 to 65 years with chronic HF and a left ventricular ejection fraction (LVEF) < 50%, undergoing screening for a cardiovascular rehabilitation program. Participants underwent pulmonary aeration assessment using the LUS protocol, which analyzed 12 lung regions (6 anterior and 6 posterior), generating a total score ranging from 0 (normal aeration) to 36 (diffuse pulmonary consolidation). Pulmonary aeration was classified as mild (1-5 points), moderate (6-15 points), or severe (> 15 points). Functional capacity was determined by the six-minute walk test (6MWT) and peak oxygen consumption (VO_2max). Statistical analysis was performed using SPSS 27.0 software, employing

tests for mean comparisons and association analysis between variables.

Results: A total of 21 individuals with chronic HF were evaluated, 70.6% male and 29.4% female, with a mean age of 52.95 ± 8.27 years and a mean LVEF of $34.7 \pm 11.7\%$. Pulmonary aeration classification revealed that 19.05% had mild impairment (LUS score between 1 and 5), while 80.95% were classified as normal. Participants showed impaired functional capacity, with a mean VO_2max of 17 ± 4.4 mL/kg/min, with 76.2% classified as "very weak" and 23.8% as "weak." In the 6MWT, the average distance covered was 433.36 ± 114.74 meters, and 55% of individuals performed below 80% of the predicted distance. A statistically significant association was identified between the LUS score and VO_2max classification ($p < 0.05$), indicating that individuals with very weak functional capacity had a higher frequency of pulmonary alterations. Conversely, those classified as weak or moderate/good predominantly had normal pulmonary scores.

Conclusion: This study demonstrated a significant association between pulmonary aeration and functional capacity in individuals with chronic HF. Even mild pulmonary alterations were linked to functional limitations, highlighting the need for an integrated assessment of pulmonary and cardiorespiratory function in clinical practice.

Implications: LUS appears to be a valuable tool for monitoring pulmonary congestion in patients with chronic HF undergoing cardiovascular rehabilitation. Early detection of pulmonary impairment may enable adjustments in exercise prescription and clinical management, contributing to a more personalized approach. Incorporating LUS into the routine assessment of these patients could assist in risk stratification and the optimization of therapeutic strategies.

Keywords: Heart failure, Lung ultrasonography, Functional capacity

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POST-TUBERCULOSIS LUNG DISEASE: ASSOCIATIONS BETWEEN EXERCISE OXYGEN CONSUMPTION, LUNG FUNCTION AND IMAGE FINDINGS

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Background: The burden of functional impairment after tuberculosis (TB) treatment is a global health issue, now referred to as post-tuberculosis lung disease (PTLD). These patients often suffer not only from persistent respiratory symptoms but also from exercise intolerance as a result of the pulmonary sequelae.

Objectives: To evaluate the correlations of peak oxygen uptake (VO_2peak) with lung mechanics, radiographic abnormalities, and quality of life (QoL) in adults with post-tuberculosis lung disease (PTLD).

Methods: This is a cross-sectional study in which 60 adults with PTLD underwent a cardiopulmonary exercise test (CPET) using a small sample of the expired volume through a miniaturized