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| **Changes in physiological parameters measured by cardiopulmonary exercise testing in patients with systemic sclerosis.** |
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| **Introduction/Aim:** Systemic sclerosis (SSc, scleroderma) patients are screened annually for pulmonary arterial hypertension (PAH) using tools such as pulmonary function testing and biomarkers. These measurements are made while the patient is resting, but early stages of PAH may only be apparent during exercise. This study aims to assess changes in physiological parameters obtained during exercise such as VE/VCO2 slope, oxygen uptake and oxygen pulse for changes suggestive of PAH. A second aim was to assess what changes occur in CPET results over time in SSc patients.**Method:** Patients with SSc according to the ACR/EULAR 2013 classification criteria completed a cardiopulmonary exercise test (CPET) contemporaneously with two consecutive annual screens for PAH (CPET1 and CPET2). Both CPETs were incremental tests, aiming for patients to cycle under load for between 8-12 minutes. Differences in physiological parameters of interest between tests were assessed using linear mixed effects models.**Results:** 63 patients (51 (81%) female) of mean age 57.3 (SD 11.5) with limited (50 (79%)) or diffuse (13 (21%)) SSc completed CPET1 and 38 completed CPET2. The average interval between CPETs was 12.0 (SD 2.7) months. Between CPETs, there was an overall decline in the adjusted mean maximum load achieved (-3.83 (IQR -6.37, -1.30), p < 0.01) and peak VO2 (mL/min) (-38.82 (IQR -71.75, -5.89), p = 0.02). There was no significant change in the VE/VCO2 slope (0.54 (IQR-0.81,1.90), p = 0.43), oxygen pulse -0.29 (IQR -1.02,0.45), p = 0.45), end-tidal CO2 (0.45 (-0.56,1.46), p = 0.38) or anaerobic threshold (-1.88 (-6.02,2.26), p = 0.37). Other parameters of interest for a diagnosis of PAH remain unchanged.**Conclusion:** No patients in the study have been diagnosed with PAH to date. The decline in load and peak VO2 indicate a decline in physical fitness over the 12 months. **Key Words:** cardiopulmonary exercise test, systemic sclerosis, pulmonary arterial hypertension.**Nomination for New Investigator Award:** No**Grant Support:** Nil. |

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