Cardiopulmonary exercise testing of patients with metastatic castrate-resistant prostate cancer as screening for vigorous exercise medicine prescription.

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Background: Exercise is recommended for patients with prostate cancer to manage treatment adverse effects, improve quality of life and potentially influence cancer-specific outcomes. Men with advanced prostate cancer and metastatic disease may be at increased risk of cardiac events due to their cancer treatment and comorbidities. The aim of this study was to assess the safety and efficacy of cardiopulmonary exercise testing (CPET) for assessing cardiorespiratory capacity and risk screening of patients with metastatic castrate-resistant prostate cancer (mCRPC) prior to engaging in a vigorous program of exercise medicine. **Methods:** Experimental design was a cross-sectional analysis of screening CPET's from a Phase III Randomised Controlled Trial (INTERVAL-GAP4) within the clinical setting involving men with mCRPC. Testing incorporated medically supervised, symptom limited, CPET with electrocardiogram (ECG) performed on a cycle ergometer until volitional exhaustion or maximal oxygen uptake peak ($V0_{2.PEAK}$) attained. Outcome Measurements included safety (incidence and severity of adverse events), feasibility (completion of CPET) and efficacy (performance outcomes, screen-fails, and cardiac pathology). Descriptive statistics were calculated as mean and standard deviation. **Results:** 104 men (age 71.5 ± 8.4 years) with mCRPC completed a medically supervised CPET. Of these, 96 patients (92.3%) met the criterion for $V0_{2.PEAK}$ attainment and were randomised to the INTERVAL-GAP4 trial, with 8 (7.7%) CPET screen-fails. Four positive cardiac abnormalities (3.8%) were observed, with these patients referred to a cardiologist for further assessment. Referred patients were all cleared to participate in vigorous exercise with no clinically significant cardiovascular disease or were determined to have newly diagnosed and subsequently controlled cardiovascular disease. Average $V0_{2.PEAK}$ was 1.72 ± 0.51 $L.min^{-1}$ absolute and 18.96 ± 5.30 $mL.kg^{-1}.min^{-1}$ relative which is in the $10\text{-}15^{th}$ percentile for healthy men of this age. Maximal heart rate achieved was 141 ± 20 bpm at a maximal workload of 128 ± 40 W. There were no cardiac events or any other exercise-related adverse events during the testing. **Conclusions:** Maximal CPET is safe for men with advanced prostate cancer. CPET with ECG is also an effective cardiac stress screening tool prior to engaging in a vigorous exercise medicine program to detect underlying cardiovascular health issues. Further, results from CPET can be used to inform appropriate exercise prescription individualised to the patient. Clinical trial information: NCT02730338. Research Sponsor: Movember Foundation.