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Title: Exercise testing confirms the role of impaired central circulatory function and elevated right ventricular stroke work index in patients undergoing lung transplantation

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Body: Introduction: Right ventricular (RV) workload assessed by RV Stroke Work Index (RVSWI) is a negative predictor of outcome in acute respiratory failure. Cardiopulmonary exercise testing (CPET) may have a role in detecting central circulatory impairment (CCI) in patients before lung transplantation (LTx) at risk for impaired RV function. Aims and Objectives: To demonstrate correlation of ventilatory inefficiency (VI) on CPET for detection of CCI in patients before LTx with RVSWI. Methods: 172 patients undergoing evaluation for LTx who had CPET and right heart catheterization were included. RVSWI (stroke volume index*(mean pulmonary arterial pressure - mean right atrial pressure)*0.0136) was calculated from invasive hemodynamic data. Pearson's correlation, significance 0.05, was assessed between RVSWI and CPET parameters. Results: RVSWI correlates highly with VI and inversely with hemodynamics on CPET, but not with peak capacity or workload.

Correlation of RVSWI and CPET Parameters

	RVSWI Pearson Correlation	Significance
Peak VE (L)	0.241	0.003*
Peak SBP (mmHg)	-0.273	0.001*
Peak DBP (mmHg)	-0.178	0.033*
Peak PetCO2 (mmHg)	-0.263	0.009*
Resting PetCO2 (mmHg)	-0.216	0.009*
Peak VE/VCO2	0.204	0.013*
Peak VO2 (L/min)	0.124	0.136
Peak Watts	0.069	0.415

* $p<0.05$; VE=Minute Ventilation; SBP=systolic blood pressure; DBP=diastolic blood pressure; PetCO2=Pressure of end tidal CO2; VCO2=Rate of carbon dioxide produced; VO2=volume of oxygen consumed

Conclusions: High right ventricular workload correlates with ventilatory inefficiency and impaired hemodynamics on CPET. Thus, exercise parameters may predict right ventricular work and LTx outcomes.