Exercise intolerance in chronic thromboembolic pulmonary hypertension after pulmonary angioplasty

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Impaired exercise capacity and ventilatory efficiency were observed in patients with chronic thromboembolic pulmonary hypertension after BPA who had normalised pulmonary arterial pressure at rest but exercise pulmonary hypertension.


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ABSTRACT

Introduction: Exercise pulmonary hypertension is common in patients with chronic thromboembolic pulmonary hypertension (CTEPH) who experience shortness of breath during exercise and reduced exercise capacity despite normalised pulmonary arterial pressure (PAP) at rest; however, the relationship between exercise pulmonary hypertension and exercise capacity remains unclear. Here we aimed to determine whether exercise pulmonary hypertension is related to exercise capacity and ventilatory efficiency in CTEPH patients with normalised resting haemodynamics after pulmonary balloon angioplasty (BPA).

Patients and methods: In total, 249 patients with CTEPH treated with BPA (mean±SD age 63±14 years; male:female 62:187) with normal mean PAP (mPAP) (<25 mmHg) and pulmonary arterial wedge pressure (≤15 mmHg) at rest underwent cardiopulmonary exercise testing with right heart catheterisation. mPAP–cardiac output (CO) during exercise was plotted using multipoint plots. Exercise pulmonary hypertension was defined by a mPAP–CO slope >3.0.

Results: At rest, pulmonary vascular resistance was significantly higher in the exercise pulmonary hypertension group (n=116) than in the non-exercise pulmonary hypertension group (n=133). Lower peak oxygen consumption (13.5±3.8 versus 16.6±4.7 mL·min⁻¹·kg⁻¹; p<0.001) was observed in the former group. The mPAP–CO slope was negatively correlated with peak oxygen consumption (r=−0.45, p<0.001) and positively correlated with the minute ventilation versus carbon dioxide output slope (r=0.39, p<0.001).

Conclusions: Impaired exercise capacity and ventilatory efficiency were observed in patients with CTEPH who had normalised PAP at rest but exercise pulmonary hypertension.

Link to published version: https://doi.org/10.1183/13993003.01982-2019