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Diagnostic, prognostic and differential-diagnostic relevance of pulmonary haemodynamic parameters during exercise: a systematic review

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Elevated mPAP/CO slope is associated with impaired survival and an independent, prognostically relevant cut-off >3 WU has been validated. A PAWP/CO slope >2 WU may be suitable for identifying post-capillary causes of PAP increase during exercise. https://bit.ly/3tgVVMB

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Abstract

Background The cardiopulmonary haemodynamic profile observed during exercise may identify patients with early-stage pulmonary vascular and primary cardiac diseases, and is used clinically to inform prognosis. However, a standardised approach to interpreting haemodynamic parameters is lacking.

Methods We performed a systematic literature search according to PRISMA guidelines to identify parameters that may be diagnostic for an abnormal haemodynamic response to exercise and offer optimal prognostic and differential-diagnostic value. We performed random-effects meta-analyses of the normal values and report effect sizes as weighted mean±SD. Results of diagnostic and prognostic studies are reported descriptively.

Results We identified 45 eligible studies with a total of 5598 subjects. The mean pulmonary arterial pressure (mPAP)/cardiac output (CO) slope, pulmonary arterial wedge pressure (PAWP)/CO slope and peak cardiac index (or CO) provided the most consistent prognostic haemodynamic parameters during exercise. The best cut-offs for survival and cardiovascular events were a mPAP/CO slope >3 Wood units (WU) and PAWP/CO slope >2 WU. A PAWP/CO slope cut-off >2 WU best differentiated pre- from post-capillary causes of PAP elevation during exercise. Upper limits of normal (defined as mean+2SD) for the mPAP/CO and PAWP/CO slopes were strongly age-dependent and ranged in 30–70-year-old healthy subjects from 1.6 to 3.3 WU and 0.6 to 1.8 WU, respectively.

Conclusion An increased mPAP/CO slope during exercise is associated with impaired survival and an independent, prognostically relevant cut-off >3 WU has been validated. A PAWP/CO slope >2 WU may be suitable for the differentiation between pre- and post-capillary causes of PAP increase during exercise.