Algorithm incorporating cardiopulmonary exercise testing to identify symptomatic people in chronic obstructive pulmonary disease

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BACKGROUND: An integral part of chronic obstructive pulmonary disease (COPD) management is to identify people who are symptomatic to optimize treatment. We evaluated an algorithm incorporating questionnaires (modified Medical Research Council [mMRC] and COPD Assessment Test [CAT]) and standardized incremental cardiopulmonary exercise testing (CPET) to identify symptomatic people with increased risk of adverse outcomes in COPD.

METHODS: Analysis of 304 people (36% women) with spirometry-defined COPD aged 42-89 years in the Canadian Cohort Obstructive Lung Disease study. The 3-step algorithm categorized people as symptomatic if meeting any of: step 1) CAT-total≥10, mMRC≥2 or CAT breathlessness [CAT-B] item≥3; and/or step 2) abnormally high exertional breathlessness intensity (>upper limit of normal by peak exercise); and/or step 3) abnormally low exercise capacity (peak power output<lower limit of normal). Reclassification and associations with physiological impairments, future risk of moderate/severe exacerbations and all-cause mortality were evaluated.

RESULTS: A CAT-B≥3 could replace mMRC≥2 with high accuracy (80%) and similar performance in the algorithm. Step 1 classified 64% as asymptomatic (CAT-total<10 and CAT-B<3), of whom 13% and 27% were reclassified as symptomatic by having abnormally high breathlessness (step 2), or abnormally low exercise capacity (step 3), respectively. People categorized by the algorithm as symptomatic versus asymptomatic had worse physiological impairments and increased risks of moderate/severe exacerbations ([hazard ratio] 2.60; [95% confidence interval] 1.96–3.47) and all-cause mortality (2.06; 0.93–4.59).

CONCLUSION: In COPD, a stepwise algorithm using CAT and standardized CPET improves identification of symptomatic adults with worse health outcomes and treatable traits.