Cardiopulmonary Stress Testing in Patients With Pulmonary Artery Hypertension

To the Editor: We read with interest and applaud the recent article by Taichman et al1 that examined the limitations of subjectively determining functional class in patients with pulmonary artery hypertension (PAH). As with heart failure (HF), PAH often leads to a substantial reduction in exercise tolerance. Thus, assessing the degree to which functional capacity is limited becomes an important aspect of examination of patients with PAH. The authors appropriately state that the modified New York Heart Association (NYHA) functional classification system, adopted by the World Health Organization (WHO), is frequently used for the following: (1) to describe patients enrolled in clinical trials, (2) to gauge their treatment response to a given intervention, and (3) to guide treatment in clinical practice. Of the participating clinicians in the study by Taichman et al, 96% indicated that they “use the NYHA/WHO functional classification as part of their evaluation when selecting therapy for their patients.” Because an interclass correlation coefficient failed to reach 0.70 in any analytic scenario and often fell well below this value, the poor NYHA/WHO functional class agreement among experienced clinicians for an individual patient clearly illustrates the need for a more objective, reliable, and valid measure of physical capacity in patients with PAH.

Cardiopulmonary exercise testing (CPX) is considered the criterion standard for determining both submaximal exercise tolerance (ie, ventilatory anaerobic threshold) and maximal aerobic capacity.2 This technique is well established in patients diagnosed as having HF and provides an objective quantification of disease severity that prognostically outperforms the NYHA classification.3,4 Moreover, several CPX variables favorably respond to numerous lifestyle, pharmacological, and surgical interventions in patients with HF.5

Our group has recently summarized the evidence (>20 original research investigations) that shows the potential clinical and research value of CPX in patients with PAH.6 Both peak oxygen consumption and measures of pulmonary gas exchange efficiency (Ve/VO2 and PETCO2) are highly reflective of disease severity (ie, the degree of PAH and functional limitation), favorably respond to several pharmacological interventions, and may provide valuable prognostic insight. The use of CPX in patients with PAH allows clinicians and researchers to eliminate interrater variation of functional classification, accurately quantify the effect of the disease state on maximal and submaximal exercise tolerance, and have more confidence in attributing improvements after a given intervention to a true physiologic adaptation as opposed to poor measurement reliability (ie, NYHA/WHO class).

However, use of CPX to objectively quantify functional status requires an increased cost, additional equipment, and personnel properly trained in conducting this exercise assessment. Other scientific guideline statements provide a detailed description of the essential components required for conducting CPX in a safe, reliable, and valid manner.7 Given the attention functional classification is afforded in both the clinical and the research settings, the importance of its accurate quantification in patients with PAH supersedes the additional cost, equipment, and personnel requirements.

Taichman et al1 eloquently illustrated the limitations of subjective functional classification in patients with PAH. The next step is to augment the implementation of a more objective, reliable, and valid measure of functional status in this patient population. On the basis of our recent literature review,8 there appears to be an evidence-based rationale for use of CPX in patients with PAH in both the clinical and the research settings.

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