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Understanding Preserved Ratio Impaired Spirometry in Multiple Dimensions: Concerns over Restrictive Preserved Ratio Impaired Spirometry

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To the Editor:

Preserved ratio impaired spirometry (PRISm) has been proposed as a concept to identify individuals with normal ratios but decreased FEV_1. Patients with PRISm and chronic obstructive pulmonary disease (COPD) often experience symptoms and/or structural abnormalities. In a recent study in the *Journal*, Labaki and colleagues reported similar survival probabilities between symptomatic individuals with PRISm and asymptomatic participants in Global Initiative for Chronic Obstructive Lung Disease stages 1 and 2 (1). This study highlights the clinical features and prognostic development of PRISm. However, it is important to classify patients as being with or without restrictive spirometric abnormalities (RSAs) (2). This classification indicates the underlying mechanism for the risk of higher mortality and enables tailored treatments of symptomatic patients with PRISm.

Restrictive PRISm is defined as a postbronchodilator ratio of FEV_1 to FVC of $\geqslant 0.7$, $FEV_1 < 80\%$, and $FVC < 80\%$. Assessing the retention of FEV_1:FVC includes examining the decreases of both FEV_1 and FVC, especially when FVC declines more rapidly than FEV_1. It is important to explore the effects of the decreases of FVC and FEV_1 in patients with restrictive PRISm. In addition to airway obstruction, more pathological conditions may lead to decreased lung compliance and a further decrease in FVC, promoting RSAs (3). A multivariate analysis showed that female sex, advanced age, and high body mass index are independent risk factors for restrictive PRISm (2).

For obese patients, three main factors have been identified that negatively correlate with lung function: hyperlipidemia, hyperglycemia, and abdominal obesity. Abdominal obesity (waist circumference $>$ 102 cm in men and $>$88 cm in women) is an important predictor of decreased FEV_1 (odds ratio, 1.94 [95% confidence interval (CI), 1.80–2.09]) and decreased FVC (odds ratio, 2.11 [95% CI, 1.95–2.29]) (4). Meanwhile, metabolic syndrome, associated with abdominal obesity, is also linked to an increased risk of cardiovascular diseases. Labaki and colleagues (1) found higher body mass index and cardiovascular mortality in the PRISm group. Furthermore, complicated interstitial lung disease, pleural thickening, pleural effusion, and respiratory muscle diseases can accelerate the decline in FVC.

Therefore, complications and causes of death differ between restrictive PRISm and nonrestrictive PRISm. Two large population-based European cohorts reported a lower incidence of heavy smoking and a higher incidence of obesity in participants with RSAs compared with those with obstructive abnormalities (5). RSAs were associated with increased risks of all-cause (hazard ratio [HR], 1.81 [95% CI, 1.33–2.47]) and cardiovascular mortality (HR, 1.85 [95% CI, 1.12–3.03]) but not lung cancer mortality (HR, 1.35 [95% CI, 0.49–3.70]), and these associations did not vary by sex or smoking status (6).

In summary, because of the different mechanisms of death between restrictive PRISm and nonrestrictive PRISm, a comprehensive evaluation should be recommended, including assessing abdominal obesity and metabolic heterogeneity, in addition to considering smoking history and other risk factors related to airway diseases. The multidimensional assessment of PRISm, considering RSAs, is crucial in tailoring management strategies and reducing all-cause and respiratory mortality. ■

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