Pulmonary Hypertension Misdiagnosed in the Obese

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MONTREAL — Obese patients often have a constellation of physiological problems that together can lead to a mistaken diagnosis of pulmonary artery hypertension, according to researchers at Duke University Medical Center in Durham, N.C.

The presence of exertional dyspnea in these patients often leads to an echocardiogram and a finding of elevated right ventricular systolic pressure. "Often the pressure is just mildly elevated, and these patients don't really have pulmonary arterial hypertension but are referred for evaluation anyway," Dr. Terry A. Fortin said at the annual meeting of the American College of Chest Physicians.

To assess diagnostic strategies for pulmonary arterial hypertension (PAH) in this often very symptomatic population,

Factors that can contribute to a mistaken diagnosis of PAH include systemic hypertension and obesity.

DR. FORTIN

Dr. Fortin and her colleagues at Duke University retrospectively assessed consecutive cardiac catheterization data on patients referred for suspected PAH.

Suspected PAH was defined as mean pulmonary arterial pressure (mPAP) greater than 25 mm/Hg, pulmonary capillary wedge pressure (PCWP) less than 15 mm/Hg, and pulmonary vascular resistance (PVR) greater than 3 Wood units. Patients with left ventricular systolic dysfunction, PAH clearly associated with a known syndrome, or significant valve or lung disease of sufficient severity to explain PH were excluded. That left 78 obese patients with mild pulmonary hypertension (PH) with mPAP greater than 25 mm/Hg and PVR less than 5 Wood units, said Dr. Fortin of Duke University Medical Center.

Of those 78 patients, 40 had baseline syndromes or conditions that the investigators believed adequately explained the patients' PH after work-up. Those conditions included connective tissue disease, congenital heart disease, chronic thromboembolic disease, portopulmonary disease, severe lung disease, high-output arteriovenous shunts, and left-sided valve disease.

Eliminating these patients left 38 patients with elevated mPAP associated with a constellation of factors that together resulted in PH, although maybe not PAH, Dr. Fortin said. Most were women with a mean age of 60 years. All were hypertensive, and virtually all had a body mass index greater than 30; half had a body mass index (BMI) greater than 40. Nearly two-thirds had diabetes and/or a sleep disorder.

"The precatheterization diagnostic tests often showed elevated right ventricular systolic pressures on referral cardiac echo, and that was typically the reason that the patients were sent to us," Dr. Fortin explained. Many of the patients did have increased artery sizes, and their right atrium size or decreased contractility in the right ventricle was of concern. About half the patients were hypoxemic, and some were hypercarbic, "which is not necessarily what we would expect in pulmonary hypertension," Dr. Fortin added.

Low lung volume was common, and many patients had reduced diffusion capacity of carbon monoxide (DLCO). Two patients had only increased right ventricular systolic pressures.

"Looking at the cardiac cath data, PVRs were not quite 3 [Wood units] in most patients, and if you break them down into those with enlarged and normal right ventricles, they're slightly different, but not statistically so," she said. The investigators also found a slight but statistically nonsignificant difference in mean pulmonary pressures, with a predominance of elevated pressures, as expected in bigger right ventricles. Overall, the patients had normal cardiac indices and were not very sick.

Only one patient had pulmonary arterial hypertension based upon a PCWP less than 15 mm/Hg and a PVR greater than 3, Dr. Fortin said. Hypoxemia, hypercarbia, low total lung capacity, and DLCO were all related to obesity, hypoventilation, and sleep disorders, she noted.

"Lest you think that obese people do not ever have pulmonary hypertension, I was quickly able to glean 13 patients … who were morbidly obese with BMIs greater than 40 who were seen in our clinic," Dr. Fortin said. "All had mPAPs greater than 25 with elevated pulmonary vascular resistances. In fact, their average pulmonary artery pressure was 60, and their PVR was 12, while their cardiac indices were very low; these were very sick patients."

The study's researchers concluded that a number of factors can contribute to a mistaken diagnosis of PAH, including systemic hypertension, obesity, sleep-disordered breathing and hypoventilation, and elevated pulmonary capillary wedge pressure.

"It should not be assumed that patients with an elevated right ventricular systolic pressure by echo have pulmonary arterial hypertension," Dr. Fortin cautioned. "Pulmonary capillary wedge pressure and diastolic dysfunction may be causative."

Aggressive management of weight, sleep disorders, hypertension, hypoxemia, and diabetes may limit the development of diastolic dysfunction and secondary pulmonary hypertension, though that's easier said than done, she added.

"Patients with this complex of disorders often have findings similar to those in full-blown PAH, and thus cardiac catheterization is necessary to help sort this out," Dr. Fortin explained. "I think that diagnostic testing also should definitely include sleep studies, as 70% of these patients had sleep disorders that were not necessarily diagnosed at the time of presentation." ■

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