Diagnosis and Management of Pulmonary Hypertension in Hospitalized Patients

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KEYWORDS

- Pulmonary hypertension (PH) • Hospitalized patients • Diagnosis • Management
- Pulmonary arterial hypertension (PAH)
- Chronic thromboembolic pulmonary hypertension (CTEPH)
- Acute right ventricular (RV) failure • Echocardiographic features

HOSPITAL MEDICINE CLINICS CHECKLIST

1. Pulmonary hypertension is an important cause of morbidity and mortality in the acute care setting.
2. Recognizing the clinical features of pulmonary hypertension in the hospital setting is of the utmost importance.
3. Diagnostic studies, such as echocardiography and right heart catheterization, can provide useful, diagnostic, classification, and prognostic data.
4. There are generalized treatments for all PH patients and specific therapies for certain PH groups.
5. Clinicians must make special considerations in certain settings, including acute right ventricular failure, perioperative period, and in the referral to a specialized pulmonary hypertension center.

INTRODUCTION

Pulmonary hypertension (PH) is defined as an elevated mean pulmonary arterial pressure (mPAP) measuring 25 mm Hg or greater as measured by right heart catheterization.[1] Although the prevalence of PH is difficult to estimate, its clinical significance in

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the hospital setting cannot be overstated. Presence of PH leads to both increased morbidity and mortality necessitating careful considerations while caring for hospitalized patients with PH.[2–5] It is important for physicians treating patients in the acute setting to understand the clinical characteristics, classification, diagnosis, and management principles for PH.

When should clinicians suspect pulmonary hypertension in hospitalized patients?

The signs and symptoms of PH are nonspecific, and there is often a delay from the onset of symptoms to the eventual diagnosis. Varied clinical features, ample comorbid conditions, and wide-ranging etiologic precipitants further contribute to diagnostic delay.

The symptoms of PH are caused by the inability to sufficiently increase cardiac output with increased demand, primarily due to an increase in pulmonary vascular resistance. Early in the disease process, symptoms often are intermittent, likely due to pulmonary vasoreactivity. As the remodeling of the pulmonary arterioles becomes more irreversible, symptoms become more reproducible and persistent. The most common and reliable symptom of PH is exertional dyspnea, which can range from mild to debilitating depending on the severity of disease.[6,7] Additional symptoms of PH include fatigue, chest pain, light headedness, dizziness, syncope, palpitations, and peripheral swelling.[8] Pulmonary vascular resistance that continues to increase eventually overwhelms the right ventricle leading to severe right ventricular (RV) dysfunction and enlargement, which results in incomplete left heart filling. Patients presenting with syncope are more likely to represent a more advanced form of RV failure.

The physical examination findings in PH can be minimal in mild disease but more pronounced in severe disease, longstanding disease, and/or in the setting of marked cardiac dysfunction. Vital signs may be notable for hypotension, tachycardia, or hypoxia. The jugular venous pulsation may be elevated indicating elevated right-sided filling pressures and/or tricuspid regurgitation. Early findings of elevated jugular venous pressures can be elicited by having patients take a slow, deep breath and observing an increase in the jugular venous pulsations. Cardiac auscultation may reveal a pronounced tricuspid regurgitation murmur, pulmonary regurgitation murmur, or a pronounced P2 representing elevated pulmonary arterial systolic pressure. If RV failure is present, the examination may reveal evidence of peripheral volume overload, including ascites, pitting sacral or extremity edema, and/or hepatomegaly.[6]

What are the echocardiographic features of pulmonary hypertension?

PH should be considered in patients with the aforementioned signs or symptoms and lack of a definitive alternative diagnosis. Although various initial tests may be appropriate in cases of suspected PH, practitioners in the acute setting should appreciate 2 important principles: (1) Echocardiography is a useful, accurate, and effective screening tool for patients with suspected PH. (2) Definitive diagnosis of PH and subsequent categorization of the World Health Organization (WHO) group can only be made with right heart catheterization.[9]

Complete echocardiography is recommended by most major professional societies for all patients suspected as having PH.[10] Echocardiography can identify pulmonary artery (PA) pressure estimates; right heart structure and function; congenital defects; and left heart disease, which accounts for most cases of PH. Finally, echocardiography can provide prognostic information if PH is ultimately diagnosed.[10,11] Bubble