

Title: Differential diagnosis for chronic leg edema.

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Question: How often does pulmonary hypertension cause chronic lower extremity edema?

Evidence-Based Answer: Pulmonary hypertension is a frequent cause of lower extremity edema especially in patients with obstructive sleep apnea and morbid obesity (BMI \geq 40 kg/m²) (SOR: C, cohort trials).

Evidence Summary:

A 2009 consecutive cohort trial evaluated if pretibial edema is a reliable sign for the presence of pulmonary hypertension (PH) and right heart failure (RHF) in 70 male patients with newly diagnosed obstructive sleep apnea (OSA). Twenty-nine patients (41%) had pretibial edema. Right heart catheterization data was obtained for 28 (97%) of these patients. Elevated right atrial pressures (RAP) were found in 26 of 28 patients (93%) indicating right heart failure. An elevation in mean pulmonary artery pressure was found in 24 of 28 patients (86%) and an elevated pulmonary artery systolic pressure was found in 23 of 28 patients (82%). Severe pulmonary hypertension was found in seven of 28 patients (25%). Additionally, first pass right ventriculograms were obtained for 26 of 29 patients with edema (90%) and for 36 of 41 (88%) patients without edema. Neither RVEF nor LVEF differed significantly between the groups. Most patients with edema had PH and elevated RAP but almost all had normal left ventricular function. The authors concluded that PH is commonly seen in patients with OSA and lower extremity edema, especially in morbidly obese patients (BMI \geq 40 kg/m²).

A 1998 nonconsecutive cohort trial evaluated the causes of bilateral leg edema among 58 adults (84% of whom were obese) enrolled from a family medicine clinic in Cleveland. All patients were then evaluated with a serum albumin, a 24-hour urine protein collection, echocardiogram, and lower extremity duplex venous ultrasound. Out of the 58 patients 13 did not complete the echocardiogram and venous duplex ultrasound. PH was defined as an estimated pulmonary artery systolic pressure greater than 40 mm Hg, and borderline PH was defined as an estimated pulmonary artery systolic pressure between 31 and 40 mm Hg. Out of the 45 patients evaluated for lower extremity edema PH was the initial clinical diagnosis for only one person. However, pulmonary hypertension/borderline pulmonary hypertension (>30 mm Hg) was the final diagnosis in 19 patients (42%). Other diagnosis included congestive heart failure (29%), idiopathic edema (27%), venous insufficiency (22%), medication use (15%), proteinuria >1 g/day (15%), and other causes (2%).

References:

1) Daniel J. O'Hearn, Avram R. Gold, Morris S. Gold, Paul Diggs and Steven M. Scharf. Lower extremity edema and pulmonary hypertension in morbidly obese patients with obstructive sleep apnea. *Sleep & breathing Journal* Vol. 13 Issue 1 March 2009. [LOE 4]

2) Blankfield RP, Finkelhor RS, Alexander JJ, et al.
Etiology and diagnosis of bilateral leg edema in primary care. *Am J Med* Vol. 105 Spetember
1998; 105:192-197. [LOE 4]

Continuing Education Question:

Which of the following is true regarding pulmonary hypertension and lower extremity edema

- 1) Pulmonary hypertension is always the cause of lower extremity edema
- 2) Pulmonary hypertension is always associated with normal left ventricular dysfunction.
- 3) Pulmonary hypertension may be seen in patients with lower extremity edema and morbid obesity with OSA
- 4) Pulmonary hypertension has never been associated with lower extremity edema.