BNP testing improves outcomes in evaluation of dyspnea

Mueller C, Scholer A, Laule-Kilian K, et al. Use of B-type natriuretic peptide in the evaluation and management of acute dyspnea. N Engl J Med 2004; 350:647–654.

CLINICAL QUESTION

Does use of the B-type natriuretic peptide test in the diagnosis of acute dyspnea improve patient outcomes?

BOTTOM LINE

Knowledge of the B-type natriuretic peptide (BNP) level during initial evaluation in the emergency department is associated with more rapid initiation of appropriate treatment, less need for hospitalization and intensive care, a shorter length of stay, and lower costs. The next question is whether the BNP can replace other tests like the chest x-ray or echocardiogram for some patients. (LOE=**1b**)

STUDY DESIGN

Randomized controlled trial (single-blinded)

SETTING

Emergency department

SYNOPSIS

Too often, new tests are introduced without a careful examination of their effect on patient-oriented outcomes. Accuracy alone is not reason enough to adopt a test. A more important reason is that its use helps patients live better or longer lives. We should also know whether is adds or reduces cost.

There is previous convincing evidence that BNP is accurate in diagnosing heart failure in patients presenting with acute dyspnea (*N Engl J Med* 2002; 106: 416–422). This latest study is the first to look at the larger impact of this test's use in clinical practice.

Of 665 consecutive adults presenting to a Swiss emergency department with acute dyspnea, 452 met the inclusion criteria. Patients with an obvious traumatic cause, serum creatinine levels greater than 2.8 mg/dL, cardiogenic shock, or who requested transfer to another hospital were excluded. The mean age of patients was 71 years; half were women.

Patients were randomly assigned (allocation concealed) to usual care supplemented by a rapid BNP level, or the usual diagnostic protocol without knowledge of BNP level. Clinicians were advised that a BNP level less than 100 pg/mL made heart failure unlikely, a result greater than 500 pg/mL made heart failure very likely, and that intermediate values required additional information and clinical judgment to make the diagnosis.

The BNP was not measured during any subsequent hospitalization. All patients underwent a careful history and physical examination, electrocardiogram, chest x-ray, and blood tests other than BNP. Echocardiography and pulmonary function testing were strongly recommended for all patients, whether or not they were admitted, although the percentage actually having the tests was not reported. Outcomes were assessed by a group blinded to treatment assignment.

The BNP test provided additional information that clearly improved patient outcomes. The likelihood of admission to the hospital was lower in the BNP group (75% vs 85%; P=.008; absolute risk reduction=10%; number needed to treat [NNT]=10), as was the likelihood of admission to the intensive care unit (15% vs 24%; P=.01; NNT=11).

Patients in the BNP group were treated more quickly (63 vs 90 mins; P=.03), spent less time in the hospital (8 vs 11 days; P=.001), and their care cost less money ($5410 vs $7264; P=.006) than those whose physicians did not have that test result. There was no difference in either in-hospital or 30-day mortality and no difference in 30-day readmission rates.

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