Heart Failure and the Bedside Valsalva Maneuver

For decades clinicians have diagnosed and treated the symptoms of left heart failure in their patients based on a carefully taken history, physical findings at the bedside, and chest roentgenogram. Symptoms such as orthopnea, paroxysmal nocturnal dyspnea, and dyspnea on exertion lack specificity, however, and may be seen in patients with chronic sinusitis as well as obstructive airways disease.1,2 The well-known physical findings of ventricular gallop sound, pulmonary rales, hepatojugular reflux, jugular venous distention, and peripheral edema, on the other hand, while quite specific (91 to 97 percent), are unacceptably insensitive (10 to 31 percent), making their absence (predictive value of a negative response 34 to 38 percent) in an individual patient of little value in excluding significant left ventricular (LV) dysfunction.3-4 Indeed, nearly two thirds of patients with proven LV dysfunction confirmed by invasive cardiac studies may not demonstrate any of these abnormal physical findings!4 The chest roentgenogram, using the presence of roentgenographic pulmonary venous hypertension or cardiomegaly, while far superior to the standard physical diagnostic signs, still is associated with rather limited sensitivity (54 to 82 percent),2,4 particularly for the detection of mild or moderate LV dysfunction.

This problem of limited sensitivity and demonstration of the prognostic importance of LV systolic dysfunction was responsible for the unprecedented enthusiasm of cardiologists nationwide for new technologies such as radionuclide ventriculography5,6 and two-dimensional echocardiography for determination of the LV ejection fraction. Finally, methods were available that would allow noninvasively the assessment of LV systolic function in an objectively reproducible manner. Somewhere in this frenzy, the concepts of LV systolic dysfunction and symptomatic “heart failure” became inappropriately equated. While diastolic LV dysfunction as a cause of clinical heart failure had already been well described,7,8 its relative importance was rediscovered by the cardiology community only after returning to the basic clinical and roentgenographic “gold standards” for heart failure recognition. Nearly half the number of patients who suffer the clinical syndrome of left heart failure could be shown to have normal LV systolic function at rest!9 The assessment of diastolic LV function, moreover, by radionuclide or echo-Doppler methods is fraught with interpretive ambiguity, since many of the measured parameters are themselves dependent on a host of secondary variables such as age, heart rate, and ventricular loading conditions in addition to the sought-after factors of abnormal ventricular compliance and relaxation.10 It is against this background that the return to a clinical bedside gold standard for the diagnosis of congestive heart failure has derived support.11-12

The Valsalva maneuver, described nearly 300 years ago,13 is employed at the bedside by many cardiologists today solely as a provocative test used in the evaluation and differential diagnostic assessment of patients with a systolic cardiac murmur. Of greater potential importance and wider applicability, however, is its performance by the patient during careful auscultatory determination of the brachial systolic arterial pressure response by the physician using routine sphygmomanometric apparatus.14 High reproducibility, objectively measurable end points, semiquantitative gradable responses, ease of determination, lack of need for specialized equipment, and proven prognostic value would appear to make it the technique of choice for the detection of LV dysfunction at the bedside.15,16

The sensitivity and specificity of the nonsinusoidal-type pressure response for the detection of LV systolic dysfunction (80 to 88 percent and 86 to 91 percent, respectively)2,4 and diastolic dysfunction (80 and 100 percent, respectively)4 in patients with chronic heart disease is unrivaled by any other physical diagnostic sign—it even surpasses the chest roentgenogram in this regard.2,4

The work of Marantz et al in this issue (see page 776) provides evidence that even in acutely ill patients, the simple bedside Valsalva maneuver may be helpful in differentiating cardiac from primary pulmonary dyspnea. Why does this important addition to the routine physical examination continue to go unnoticed, untaught, and unpracticed by physicians caring for patients217-20? In this era of cost containment, isn’t it about time that we return to proven basics!

Michael J. Zena, M.D., F.C.C.P.
Patchogue, New York

Division of Cardiology, Brookhaven Memorial Hospital Medical Center
Reprint requests: Dr. Zena, 101 Hospital Road, Patchogue, New York 11772

REFERENCES

2 Zema MJ, Masters AP, Margouleff D. Dyspnea: the heart or the lungs? differentiation at bedside by use of the simple Valsalva maneuver. Chest 1984; 85:59-64
Acute Irritants

More than a Nuisance

There is a continuing debate on the importance of acute irritants among public health and medical scientists concerned with the adverse impact of environmental exposures. Although the commonly recognized human response to irritation is subjective symptomatology, the Occupational Safety and Health Administration (OSHA) recently justified setting exposure limits for irritants based only on objective signs of irritation. In selecting new exposure limits for a number of irritants, OSHA relied heavily on consensus recommendations published by the American Conference of Governmental Industrial Hygienists (ACGIH). In contrast, the Nordic countries have accepted, to a greater degree than the ACGIH, subjective evidence of irritation as a critical effect to guide exposure control and these countries have set more stringent exposure limits. Given the differing approaches to defining irritants, it is worth reviewing the nature of the irritant response and the range of the impact of this response.

An acute irritant response occurs when tissue is irritated by chemicals absorbed from inhaled vapors or aerosols. Irritation of the respiratory tract may result in airway narrowing, inflammation, sensory nerve impulses, and other nonspecific reversible responses. The truly acute reactions occur within minutes to hours after the exposure. For example, the bronchoconstrictive effect of inhaled histamine begins immediately upon inhalation and persists for 5 to 10 minutes. The degree of the immediate response, however, can be modified, enhanced or diminished, by exposures that occurred in the recent past or by pre-existing disease.

The irritant effects of a variety of agents appear to decrease following repeated exposure, ie, response is attenuated in exposed individuals through a tolerance mechanism. The phenomenon of attenuation has been well described for ozone and has also been demonstrated for exposures to nitrogen dioxide, hydrogen sulfide, phosgene, and cadmium oxide. Unless there is no recent history of prior exposure, the properties of tolerance and sensitization make it difficult to predict the response of an exposed group. This is because an individual’s probability of response may change over time which increases the heterogeneity of any population exposed to a respiratory irritant. The degree of acute response can also be altered by the presence of pre-existing disease.

Irritant-related symptoms have a wider impact than commonly realized. Eye irritation can include stinging, itching, and burning of the eyes along with tearing as disabling as that caused by exposure to tear gas. Nasal irritation can consist of a burning sensation in the nasal passages, severe congestion and discharge, as well as persistent sneezing. The larynx can be affected with responses ranging from hoarseness to severe laryngeal edema. The irritant cough can be harsh, continuous and painful often accompanied by sputum production with the secondary impact of headache and/or chest discomfort. Even in the absence of cough, irritants can cause chest pain, chest tightness with asthma-like symptoms, wheezing, and dyspnea.

The National Institute for Occupational Safety and Health commented on the increased risks which are present for those who are experiencing irritant symp-