

Diastolic Heart Failure or Heart Failure with normal Ejection Fraction

In 2000, an European Study Group proposed criteria for the diagnosis of diastolic congestive heart failure (CHF) or CHF with normal ejection fraction (CHF-nIEF). The simultaneous presence of the following 3 criteria was considered obligatory:

- 1) evidence of congestive heart failure
- 2) normal or mildly abnormal left ventricular dysfunction
- 3) evidence of abnormal left ventricular relaxation, filling, diastolic distensibility, or diastolic stiffness.

The assessment of left ventricular diastolic function, abnormal relaxation, filling and diastolic distensibility, currently can only be performed invasively with high fidelity left ventricular pressure measurements with micromanometer transducers.

The conductance catheter technique, however, combines micromanometer pressure measurement with real-time ventricular volume measurements at high-time resolution. Consequently left ventricular pressure-volume analysis may therefore provide *definitive objective evidence of ventricular diastolic dysfunction*.

Since the publication of the Framingham and Mayo clinics studies indicating that 50% of the CHF patients have a normal EF, active research and debates are focusing on Diastolic Heart failure.

References

1. Zile MR, Gaasch WH, Carroll JD et al. Heart failure with a normal ejection fraction. Is measurement of diastolic function necessary to make the diagnosis of diastolic heart failure? *Circulation*. 2001;104:779-782.
“After decades of study, there is little agreement as to the utility of echocardiographic-Doppler indexes of LV diastolic function in the diagnosis of diastolic heart failure”
“However, the European study group also requires evidence of abnormal LV relaxation, filling, diastolic distensibility, or diastolic stiffness”
2. Vasan RS and Levy D. Defining diastolic heart failure. A call for standardized diagnostic criteria. *Circulation* 2000;101:2118-2121.
“The first step toward evaluating any potential treatment for diastolic heart failure is to develop uniform criteria for its diagnosis. This task, however, is complicated by the pathophysiological heterogeneity of diastolic heart failure and by the limitations of currently available noninvasive modalities for diagnosing left ventricular diastolic dysfunction”
“Recently the European Society of Cardiology proposed guidelines for the diagnosis of congestive heart failure. These guidelines require objective evidence of LV dysfunction for a diagnosis of CHF”

“Definitive objective evidence of ventricular diastolic dysfunction requires cardiac catheterization. This would typically involve demonstrating an increased LV end-diastolic filling pressure in the presence of a normal or reduced LV end-diastolic volume”

“We recommend an uniform approach to the diagnosis of diastolic heart failure rather than waiting until a noninvasive test for accurately assessing left ventricular diastolic dysfunction is developed.”

3. W Grossman. Defining Diastolic Dysfunction. Circulation 2000;101:2020-2021.

“Epidemiological and case control studies of individuals presenting with clinical heart failure have estimated that 40% to 50% of such patients have normal systolic function and presumed diastolic heart failure”

“It is now clear that the majority of patients with what is currently called “systolic heart failure” also have diastolic dysfunction of various degrees.”

4. MF O’Rourke. Diastolic heart failure, diastolic left ventricular dysfunction and exercise tolerance. JACC 2001;38:803-805.

“Modern medicine has been slow to accept diastolic dysfunction as a cause of heart failure, largely because there are no accepted noninvasive measures of diastolic dysfunction.”

5. MR Zile, DL Brutsaert. New concepts in diastolic dysfunction and heart failure: part I. Diagnosis, Prognosis, and Measurements of diastolic dysfunction. Circulation 2002;105:1387-1393.

“Thus, all patients with systolic heart failure and elevated diastolic pressures in fact have combined systolic and diastolic heart failure”

6 MR Zile and DL Brutsaert. New concepts in diastolic dysfunction and diastolic heart failure: part II. Causal mechanisms and treatment. Circulation 2002;105:1503-1508.

“Diastolic heart failure is now recognized as an important problem..”

7. Kawaguchi M, Hay H, Fetis B, Kass DA. Combined ventricular systolic and arterial stiffening in patients with heart failure and preserved ejection fraction. Circulation. 2003;107:714-720.

“HF-nEF is not solely a diastolic disease but also characterized by systolic ventricular and arterial stiffening and, thus, adverse coupling between the systems.” *A clinical study using P-V relationships as measured by the conductance catheter technique.*

8. Burkhoff D, Maurer MS, Packer M. Heart failure with normal ejection fraction. Is it really a disorder of diastolic function? Circulation 2003;107:656-658.

“Have we failed because diastolic dysfunction is too difficult to understand or manage, or is it because Heart Failure with normal EF has nothing to do diastolic dysfunction at all?”