Anomalies in criteria for heart failure with preserved ejection fraction

Sir,

The diagnostic algorithm for heart failure with preserved ejection fraction (vol 74(2), 2013, p. C26) appears to relate to left ventricular ejection fraction >45–50%, as opposed to patients with left ventricular ejection fraction >50% mentioned in the European Society of Cardiology Consensus Statement (Paulus et al, 2007).

Symptomatic heart failure, characterized by pulmonary capillary wedge pressure >15 mmHg (averaging 33 mmHg in one study)(Anjan et al, 2012), can also occur in subjects with left ventricular ejection fraction >50% despite brain natriuretic peptide levels <100 pg/ml (Anjan et al, 2012). Among 46 subjects characterized by left ventricular ejection fraction >50%, and brain natriuretic peptide levels equal to, or less than 100 pg/ml, jugular venous pressure averaged 9 cm water, orthopnoea was a feature in 48%, and paroxysmal nocturnal dyspnoea occurred in 28%. Forty three per cent were in New York Heart Association functional class III. Accordingly, the currently accepted brain natriuretic peptide cut-off level of <100 pg/ml may not suffice to rule out heart failure.

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Anjan VY, Loftus TM, Burke MA et al (2012) Prevalence, clinical phenotype, and outcomes associated with normal B-type Natriuretic Peptide levels in heart failure with preserved ejection fraction. *Am J Cardiol* **110**: 870–6

Paulus WJ, Tschope C, Sanderson JE et al (2007) How to diagnose diastolic heart failure: a consensus statement on the diagnosis of heart failure with normal left ventricular ejection fraction by the Heart Failure and Echocardiography Association of the European Society of Cardiology. *Eur Heart J* **28** (20): 2539–50

Sir,

We thank Dr Jolobe for his interest and for his response to our article. Dr Jolobe is correct that the cut-off level for left ventricular ejection fraction between those labelled as having heart failure with preserved ejection fraction and those with left ventricular systolic dysfunction remains controversial.

We would like to draw attention to a more up-to-date European Society of Cardiology document than the 2007 statement, announced in May 2012 (Paulus et al, 2007; McMurray et al, 2012). In these guidelines, the authors recognized that the main terminology used to describe heart failure is historical and is based on measurement of left ventricular ejection fraction. The major trials in patients with heart failure and reduced left ventricular ejection fraction mainly enrolled patients with a left ventricular ejection fraction <35%. It is only in these latter patients that effective therapies have been demonstrated to date.

The European Society of Cardiology guidelines go further to accept that while the normal left ventricular ejection fraction is widely considered to be >50%, many of the recent trials of patients with heart failure with preserved ejection fraction enrolled patients with a left ventricular ejection fraction >40–45% with no other abnormalities on echocardiography and they certainly did not have impaired contraction. This is why the term used was preserved rather than normal ejection fraction. The 2012 European Society of Cardiology guidelines acknowledge that patients with left ventricular ejection fraction 40–50% are in the grey area.

With regards to Dr Jolobe's point on the cut-off limit for natriuretic peptide, it is well recognized that we are dealing with a continuum and the cut-off point is designed to maximize the diagnostic yield of the test. Patients with proven heart failure on treatment will have symptoms and signs of heart failure (clinical and laboratory), and yet will have lower natriuretic peptide levels than the cut-off point. The cut-off points have sensitivities and specificities less than 100% (Paulus et al, 2007; Mant et al, 2009). These cut-off points are for new cases of heart failure which are not being treated and should be taken together with the history, the clinical examination and the results of the other investigations to reach the final diagnosis.

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