Original article Bradley EH *et al.* (2006) Achieving rapid door-to-balloon times: how top hospitals improve complex clinical systems. *Circulation* 113: 1079–1085

Prehypertension and cardiovascular disease in high-risk individuals: the ARIC study

Individuals with blood pressure in the range 120/80–139/89 mmHg are described as prehypertensive. Although this condition has been associated with an elevated risk of developing cardiovascular disease, the relative risks among population subgroups are unknown. To assess the impact of prehypertension in high-risk cohorts, Kshirsagar and co-workers analyzed prospective data from the Atherosclerosis Risk in Communities (ARIC) study.

The study included 8,960 men and women aged 45–64 years without coronary heart disease or history of stroke. Of these, 5,622 participants had optimum blood pressure (120/80 mmHg), 2,059 had normal blood pressure (120/80–129/84 mmHg) and 1,279 had high-normal blood pressure (130/85–139/89 mmHg). Subgroup analyses were carried out among African Americans, participants aged 55–64 years, individuals with diabetes, participants with renal insufficiency, those with a BMI ≥ 30 kg/m², and those with levels of LDL cholesterol < 4.1 mmol/l (160 mg/dl).

Over an average follow-up of 11.6 years, a total of 772 cardiovascular disease events occurred. Participants with high-normal blood pressure were approximately 2.5 times more likely to develop cardiovascular disease than those with optimum blood pressure, whereas the risk for individuals with normal pressure increased by about 1.8-fold. Effects of prehypertension were more evident among African Americans, participants with diabetes, individuals with a high BMI or those with relatively low levels of LDL cholesterol, suggesting that blood pressure thresholds for therapeutic intervention could be reduced for certain high-risk cohorts. Whether intervention should include lifestyle modification, pharmacotherapy, or both, has yet to be determined.

Claire Braybrook

Original article Kshirsagar AV *et al.* (2006) Blood pressure usually considered normal is associated with elevated risk of cardiovascular disease. *Am J Med* 119: 133–141

Brain natriuretic peptide is a marker of diastolic wall stress in heart failure

Some studies have found plasma brain natriuretic peptide (BNP) to be a marker of left ventricular dysfunction and a predictor of morbidity and mortality in heart disease, but the relationship between heart function and BNP levels is not well understood. Stretching of cardiomyocytes is reported *in vitro* to be the most important factor in BNP regulation, and thus BNP is thought to be released from heart muscle in response to stress on the heart wall. Researchers in Japan, therefore, investigated the relationship between BNP levels and heart function in 160 consecutive patients with congestive heart failure.

Although an expected correlation between plasma BNP levels and left ventricular end-diastolic pressure was seen, a much stronger correlation was found, in both systolic and diastolic heart failure, between plasma BNP levels and end-diastolic wall stress.

The authors suggest that the correlation between left ventricular end-diastolic wall stress and BNP levels indicates increased BNP gene expression and supports a regulatory role for myocyte overstretch. They state that the robust relationship between end-diastolic wall stress and BNP release across systolic and diastolic heart failure might allay some of the confusion caused by the heterogeneous BNP levels seen in previous studies. Understanding this relationship might help to improve the diagnosis and management of heart problems.

Jim Casey

Original article Iwanaga Y *et al.* (2006) B-type natriuretic peptide strongly reflects diastolic wall stress in patients with chronic heart failure: comparison between systolic and diastolic heart failure. *J Am Coll Cardiol* 47: 742–748

Cangrelor inhibits platelet activation in patients undergoing PCI

Complications during percutaneous cardiac intervention (PCI) can be caused by platelet-initiated acute thrombosis and coronary embolization. The P2Y₁₂-receptor antagonist cangrelor has been found to inhibit platelet activation. In a two-part study involving a total of 399 patients undergoing PCI, Greenbaum *et al.* assessed the safety and pharmacodynamics of