280 Elevated brain natriuretic peptide is associated with abnormal tissue Doppler characteristics in patients with aortic stenosis

R. Rajani, H. Rimington, J. Chambers. St Thomas’ Hospital, Department of Cardiology, London, United Kingdom

Brain natriuretic peptide (BNP) is expected to be related to left atrial pressure, which can also be estimated using tissue Doppler echocardiography.

Aims: To assess the relationship between BNP level and measures of systolic and diastolic function on Tissue Doppler Imaging (TDI) in patients with aortic stenosis.

Methods: We studied 50 patients with asymptomatic moderate to severe aortic stenosis (ECAO 1.10 cm²) and normal transverse LV systolic function. The median age was 73 years (range 29-87) and 38 were male. We recorded trans-mitral pulsed Doppler and TDI at the lateral and septal mitral annuli. BNP levels were quantified using a fluorescence-immunoassay technique (Triage BNP test, Biosite Diagnostics, Inc).

Results: Log BNP was inversely correlated to both the lateral and mitral annular systolic velocities (r = -0.01; r = -0.01, respectively, and directly related to the septal E/E' ratio (P = 0.004). ROC curve analysis for an abnormal BNP (>100 pg/ml) gave an AUC of 0.6 for the septal systolic velocity and 0.7 for the E/E' ratio. An E/E' ratio > 10 gave a sensitivity of 76% and specificity of 30% for a high BNP while a ratio > 15 gave a sensitivity of 87% and specificity of 67%. A systolic velocity < 5 cm/s was 100% specific and below 8 cm/s 100% sensitive for a high BNP.

Conclusions: These results show that Tissue Doppler indices are related to the BNP level. A systolic velocity < 5 cm/s or E/E' ratio > 15 reliably predict a high BNP level.

280 Mitral annular motion as a surrogate for left ventricular function: correlation with brain natriuretic peptide levels

M. Elnoamany, A. Kilany. Shabin Elkom, Egypt

Background: Pulsed-wave (PW) Doppler tissue velocities of the mitral annulus correlate well with Left Ventricular (LV) diastolic and systolic functions. Brain natriuretic peptide (BNP) levels have been shown to be elevated in patients with symptoms of mitral valve dysfunction. We investigated the relation of mitral annular BNP to the severity of mitral annular dysfunction.

Objectives: To validate the accuracy of mitral annular motion (MAM) assessed by Doppler Tissue Imaging (DTI) & M-mode Echocardiography (MME) as a surrogate for determination of LV function in comparison with BNP.

Methods: A series of 133 patients with a variety of cardiac pathologies referred for echocardiography and 20 healthy age & sex matched volunteers as a control group were included in the study. Ejection fraction (EF) of LV, Doppler recordings of the mitral inflow, MME and PWDTI data (from each of 4 mitral annular sites, inferior, anterior, septal and lateral) were obtained. Mean peak (S) mitral annular velocity (Sm), mean annular early (E) velocity (Em) by PWDTI and mean mitral annular plane (S) excursion (MAPSE) by MME were calculated by averaging at each annular site. BNP levels were measured by a rapid immunoassay and blinded to cardiologist making the assessment of LV function.

Results: MAPSE < 12 mm determined by MME has 90% sensitivity, 88% specificity & 88% accuracy for detection of LV EF < 50%, while these values were 94%, 93% & 94% respectively for (S) MAM (Sm) < 8 cm/s determined by PWDTI. BNP level > 75 pg/ml has 98% sensitivity, 90% specificity & 97% accuracy for detection of LV EF < 50%. While these values were 94%, 93% & 94% respectively for (S) MAM (Sm) < 8 cm/s determined by PWDTI. BNP level > 5.14 pg/ml was significantly higher in the NT-proBNP positive group (E/Ea 144-7 vs 114-4, p = 0.03, E/Vp 2.24-0.8 vs 1.84-0.5, p = 0.05), as was LV mass index (1864-92g/m² vs. 1404-48 g/m², p = 0.03). Age (55-10 years vs 49-13 years, p = 0.02) and the proportion of patients on dialysis (68% vs 29%, p = 0.004) to be independently associated with an elevated NT-proBNP level.

Conclusions: A significantly elevated NT-proBNP level was present in 59% of patients with ESRD, especially those on dialysis, and was associated with significantly increased mortality. The presence signifies LV dilatation and impaired systolic and diastolic function. There was no association with severe CAD or inducible ischaemia.

289 Baseline cardiac structural and functional characteristics and prognostic significance of end stage renal disease patients with elevated N-Terminal Pro-B-Type natriuretic peptide level

R. Shurma 1, D. Pullin2, D.C. Gaze3, C.H. Streather4, H. Gregson4, R. Mehta5, O. Collomence6, N.J.D. Brecker2, 1Dartford, United Kingdom; 2The Heart Hospital, Cardiology, London, United Kingdom; 3St George’s Hospital, Biochemistry, London, United Kingdom; 4St George’s Hospital, Nephrology, London, United Kingdom; 5Southampton General Hospital, Medical Statistics, Southampton, United Kingdom

Elevated baseline levels of natriuretic peptides occur in a proportion of patients with end stage renal disease (ESRD). The aim of this study was to identify baseline characteristics and determine the prognostic significance of those renal failure patients with a raised N-terminal pro-B-type natriuretic peptide (NT-proBNP) level.

Methods: 84 renal transplant candidates (mean age 52±12 years, 75 male, mean creatinine 608±272 mmol/l) were prospectively studied over a mean follow-up time of 1 66±0.54 years. All had coronary angiography, dobutamine stress echocardiography and baseline biochemical markers. Severe coronary artery disease (CAD) was defined as luminal stenosis > 70% in at least 1 vessel by visual estimation. A baseline NT-proBNP level > 125 pg/ml was taken as significantly elevated. The primary end point was total mortality. Results. 50 (59%) patients had elevated NT-proBNP levels. This was associated with significantly increased mortality (p = 0.05). Those patients who had significantly impaired left ventricular (LV) fractional shortening (31±10% vs 41±9%, p = 0.04), lower mitral annular systolic velocity (0.06±0.02 m/s vs 0.09±0.02 m/s, p = 0.01) higher LV end diastolic diameter (5.1±0.9 cm vs 4.8±0.8 cm, p = 0.04), higher LV end systolic diameter (3.1±0.8 cm vs 2.5±0.7 cm, p = 0.008) compared to those with NT-proBNP levels < 125 pg/ml. Diastolic function was significantly impaired in the NT-proBNP positive group (E/Ea 14±7 vs 11±4, p = 0.03, E/aP 2.2±0.8 vs 1.8±0.5, p = 0.09), as was LV mass index (1864±92g/m² vs 1404±48 g/m², p = 0.03). Age (55±10 years vs 49±13 years, p = 0.02) and the proportion of patients on dialysis (68% vs 29%, p = 0.004) were significantly higher in the NT-proBNP positive group. Diabetes, the percentage of patients with severe CAD and inducible regional wall motion abnormality were similar in both groups. Stepwise logistic regression analysis identified dialysis (OR 5.8, 95% CI -9.7, -21 p = 0.004) to be independently associated with an elevated NT-proBNP levels. Conclusions: A significantly elevated NT-proBNP level was present in 59% of patients with ESRD, especially those on dialysis, and was associated with significantly increased mortality. Its presence signifies LV dilatation and impaired systolic and diastolic function. There was no association with severe CAD or inducible ischaemia.