511 Brain natriuretic peptide predicts exercise induced symptoms in patients with apparently asymptomatic aortic stenosis

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Brain natriuretic peptide (BNP) correlates with the grade of aortic stenosis (AS), but its relationship with symptoms is not adequately determined.

Aim: To test the relationship between BNP level and exercise induced symptoms in patients with apparently asymptomatic aortic stenosis.

Methods: We studied 43 patients with asymptomatic moderate to severe AS (mean gradient 51±17 mmHg) with normal LV transverse systolic function. The median age was 68 years (range 29-87) of whom 38 were male. All patients had echocardiography, BNP measurements and Modified Bruce protocol exercise testing. BNP levels were quantified using a fluorescence immunoassay technique (Triace BNP test, Biosite Diagnostics, Inc.)

Results: 14 (33%) patients developed symptoms on exercise whilst 29 (67%) remained asymptomatic. Age, exercise time and BNP, but not grade of stenosis differed significantly between these groups using a t-test (Table 1). Exercise time was independently related to age (P=-0.000) and Log BNP (P=0.002) but not the grade of aortic stenosis. ROC curve analysis gave an optimal cut off value of 60pg/ml with a sensitivity 93%, specificity 66%, and positive and negative predictive accuracy 56% and 95% respectively for predicting exercise induced symptoms (AUC 0.865).

Conclusion: The BNP level predicts the presence of occult symptoms in aortic stenosis. Treadmill exercise testing is not necessary if the resting BNP level is normal.

512 Early myocardial abnormalities in asymptomatic patients with severe aortic regurgitation: strain imaging study

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Background: Early left ventricular (LV) dysfunction in asymptomatic patients (pts) with severe aortic regurgitation (AR) is often underestimated due to the lack of a sensitive diagnostic tool to monitor systolic function. Ultrasound strain rate imaging (SRI) could provide a new technique for detecting early dysfunction in regional LV systolic deformation.

Aim: To assess SRI prospectively in predicting LV dysfunction in asymptomatic pts with AR.

Methods: The study population consisted of 41 pts: 21 asymptomatic pts with chronic isolated moderate/severe and severe AR (age 64±10) and 20 age matched healthy subjects. All pts underwent a standard echocardiographic examination extended with a tissue Doppler imaging study. For LV radial deformation, the posterior wall (LVPW) was examined. To assess LV longitudinal deformation, S and SRI data were acquired from the anterior and the inferior wall.

Results: There was a significant reduction of SR in the radial and the longitudinal direction in pts with severe AR compared to the healthy subjects (Fig 1). The reduction in SR correlated significantly with the LV end systolic diameter. There was no difference in S between the two groups of the pts.

Figure 1. P<0.001

Conclusions: SR imaging is a sensitive tool in detecting subclinical changes in radial and longitudinal deformation in asymptomatic pts with severe AR. It could be a useful tool in predicting LV dysfunction during patients follow-up.

514 The role of different color Doppler methods in the assessment of severity of mitral regurgitation

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For grading mitral regurgitation (MR) color jet area (JA), vena contracta (VC) and effective regurgitant orifice (ERO) measurement by PISA method can be used besides quantitative Doppler (QD). In this study we attempted to answer the questions:

1. Which of the three color Doppler (CD) methods has better correlation with regurgitant volume (RV) and regurgitant fraction (RF) measured with QD as reference method?
2. Is the diagnostic value of CD methods influenced by the left ventricular function or by the direction of the MR jet?
3. Could QD be replaced by the combination of CD methods?

We analyzed 32 consecutive cases (20 men, 12 women, mean age 59±12 years) with at least moderate degree MR with QD. The etiology was ischemic (ISCH) in 15, prolapse or flail leaflet in 9, rheumatic in 5 and other in 3 cases. We performed JA, VC, ERO and RF measurements according to the guidelines in all cases. Patients were divided into subgroups:

1. Ejection fraction (EF): 55% or higher 17 cases, less than 55% 15 cases (14 ISCH).
2. Regurgitant jet, central 17 cases (13 ISCH), eccentric 15 cases

In case of EF>55% JA had the strongest correlation with QD (RVJA r=0.67 p<0.001; RFJA r=0.78 p<0.001; RVERO r=0.59 p<0.01; RFERO r=0.62 p<0.01; RVVC r=0.47 p<0.01; RFVC r=0.46 p<0.01). In case of EF<55% ERO had better correlation with QD (RVERO r=0.83 p<0.001; RFERO r=0.84 p<0.001; RVVC r=0.47 p<0.01; RFVC r<0.05; RVJA r<0.05). In the central jet group only QD and ERO were correlated (RVJOJA r=0.58 p<0.05; RFJOJA r=0.59 p<0.05). In cases of eccentric MR all color Doppler methods had good correlation with QD (RVJA r=0.76 p<0.01; RFJA r=0.82 p<0.01; RVERO r=0.77 p<0.01; RFERO r=0.77 p<0.01; RVVC r=0.67 p<0.05; RFVC r=0.64 p<0.001). In the eccentric MR group EF was higher (59.5±11% vs. 38.9±10%, p<0.0001). In the whole patient group only the existence of ERO>0.3cm2 and VC>5mm was predictive for RV<40%, i.e. grade III. MR (sensitivity: 82%; specificity: 90%).

Conclusions: In case of left ventricular dysfunction and associated central MR jet QD is correlated only with ERO measured by PISA method. In case of good EF and eccentric jet JA and ERO have stronger correlation with QD than VC. The diagnostic value of CD methods depends on left ventricular function and the direction of the MR jet. Quantitative Doppler can be replaced by simultaneous use of vena contracta and PISA methods.

515 Assessment of the severity and mechanism of mitral regurgitation by magnetic resonance imaging


Background: Accurate assessment of the severity and mechanism of mitral regurgitation (MR) is of paramount importance before mitral valve repair surgery. So far, this required both transthoracic (TTE) and transesophageal echocardiography (TEE). The aim of this study was to evaluate whether cardiac Magnetic Resonance Imaging (cMRI) could achieve both aims.

Methods: We studied 21 pts (12 men, 64±14 yrs) referred for cardiac surgery by TTE, TEE, and cMRI. Mitral regurgitant volume (RV) by cMRI was compiled as the differences between the left ventricular stroke volume (obtained from cine images using the Simpson's method) and aortic stroke volume (measured using aortic phase contrast imaging). cMRI-derived RV was compared to that obtained by TTE using the proximal isovelocity surface area (PISA) method. Mechanism of MR by cMRI was defined on 3-chamber views as type I: anular dilatation; type II:...