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## Left ventricular longitudinal deformation and B-type natriuretic peptide activation and changes in asymptomatic aortic stenosis

C Henri, R Dulgheru, J Magne, S Kou, L Davin, A Nchimi, C Oury, L Pierard, P Lancellotti

University of Liège, GIGA Cardiovascular Sciences, Departments of Cardiology and Radiology, Heart Valve Clinic, CHU Sart Tilman, Liège, Belgium

**Purpose:** ESC guidelines emphasize the usefulness of B-type natriuretic peptide (BNP) measurements in aortic stenosis (AS). The purpose of the present study was to determine the relationship between BNP activation, serial BNP changes and left ventricular (LV) longitudinal strain (deformation).

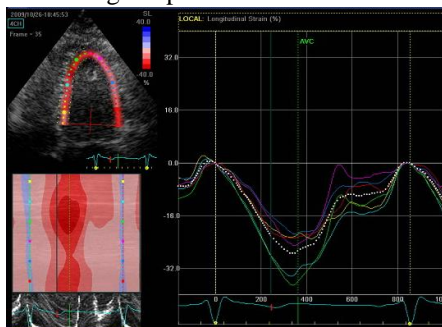
**Methods:** We studied asymptomatic patients with  $\geq$  moderate AS and preserved LV ejection fraction who underwent concomitant BNP level measurement and echocardiography in our Heart Valve Clinic. BNP measurements were repeated each 6 or 12 months and annualized BNP changes were calculated as the difference between the baseline and last BNP measurements divided by the duration of follow-up. LV longitudinal strain was measured using speckle-tracking in apical 4-chamber view.

**Results:** At baseline, patients (n=48) were divided into 2 groups according to the median of BNP level (66pg/mL). Patients in the high BNP level group had a significantly lower LV longitudinal strain. During follow-up, patients were divided into 2 groups according to the median of annualized BNP changes (20pg/mL/year). Patients in the high serial BNP changes group had a significantly lower LV longitudinal strain. Significant correlations were found between BNP level at baseline, annualized BNP changes and LV longitudinal strain.

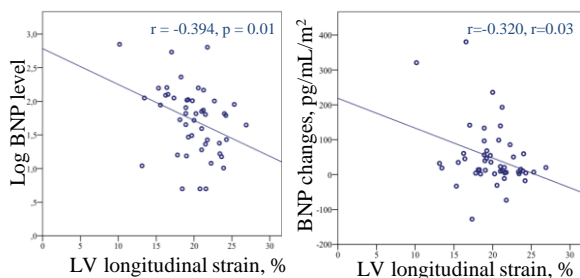
**Table:** LV longitudinal strain according to BNP level at baseline and annualized BNP changes.

Baseline	Low BNP level	High BNP level	p
LV longitudinal strain, %	$-21.1 \pm 2.8$	$-18.8 \pm 3.4$	0.02
Follow-up	Low BNP changes	High BNP changes	p
LV longitudinal strain, %	$-20.9 \pm 3.2$	$-18.9 \pm 3.1$	0.03

**Figure 1:** LV strain curve using speckle-tracking in apical 4-chamber view



**Figure 2:** Correlation between BNP level at baseline, annualized BNP changes during follow-up and LV longitudinal strain.



**Conclusions:** In AS, BNP activation and serial BNP changes during follow-up are determined by LV function as assessed by deformation imaging.