



Non Invasive Imaging

NONINVASIVE ESTIMATION OF CARDIAC PROPERTIES IN PATIENTS WITH HYPERTENSION USING SPECKLE TRACKING ECHOCARDIOGRAPHY: A COMPARATIVE STUDY BETWEEN GOOD AND POOR CONTROLLED HYPERTENSION

Poster Contributions

Hall C

Sunday, March 30, 2014, 3:45 p.m.-4:30 p.m.

Session Title: Non Invasive Imaging: Myocardial Strain, Cardiac Mechanics and Diastolic Function

Abstract Category: 15. Non Invasive Imaging: Echo

Presentation Number: 1210-43

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Background: We reported that combination of left atrial volume (LAV) and emptying function (EF) could accurately predict pulmonary capillary wedge pressure (ePCWP). We sought to noninvasively evaluate cardiac properties including time constant of left ventricular (LV) relaxation (Tau), myocardial stiffness and ePCWP in hypertension (HTN) and clarify the cardiac feature in HTN using speckle tracking echocardiography (STE).

Methods: We evaluated cardiac properties using STE in 86 patients with HTN and 47 controls (age 73±11, men 21). HTN was divided in 2 groups according to mean blood pressure (BP) for 2 years; 50 good controlled HTN (age 74±7, men 23, systolic BP<140 and diastolic BP<90mmHg) and 36 poor HTN (age 75±7, men 22, systolic BP≥140 or diastolic BP≥90mmHg). The ePCWP was determined as 10.7 - 12.4 x log (active LAEF / minimum LAV). Tau is calculated as isovolumic relaxation time / {ln (0.9 x systolic BP) - ln ePCWP}. Isovolumic relaxation time was obtained by Doppler echo. LV stiffness is calculated based on liner elastic theory as ePCWP / ((thickness at end systole - thickness at end diastole) / thickness at end systole).

Results: See table.

Conclusions: LV compliance, filling pressure and LAEF in good HTN were preserved and comparable to normal, whereas LV relaxation was already impaired and LAV was increased even in good HTN. LV diastolic function including not only relaxation but also stiffness and LA structure and function in poor HTN were impaired associated with hypertrophy without reduction of LVEF.

	Normal	Good HTN	Poor HTN
BP, mmHg	126±9/75±7	131±5*/78±6*	142±3* #/84±7* #
LV mass index, g/m ²	92±16	100±14*	124±22* #
LV ejection fraction, %	66±7	67±5	64±7
E/e'	7.4±1.8	8.3±1.9	9.4±2.6*#
Tau, msec	23±7	26±5*	48±9*#
LV stiffness	21±9	24±8	51±31*#
ePCWP, mmHg	7.7±2.9	8.4±2.3	12.9±4.1*#
Maximun LAV, ml/m ²	35±9	41±11*	58±20*#
Total LAEF, %	48±7	49±5	39±9*#

*p<0.05 vs. Normal, #p<0.05 vs. Good HTN