

IMAGING AND DIAGNOSTIC TESTING

SHOULD NORMAL CUTOFF VALUES FOR E/E' AND BNP DIFFER IN THE PRESENCE OF OBESITY?

ACC Poster Contributions
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Session Title: General Echocardiography: Prognosis and Filling Pressure by TDI and Strain Imaging
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Background: Clinical estimation of volume status and pulmonary wedge pressure (PWP) relies on physical findings (jugular venous pressure, JVP), echo parameters (E/e' ratio) and plasma neurohormones (NT-BNP). Prospective data regarding the influence of obesity on the accuracy of these noninvasive measures are lacking.

Methods: Consecutive patients referred for right heart catheterization were prospectively enrolled. Cardiologists blinded to clinical data assessed JVP by physical exam ≤ 1 hour prior to cath. Contemporaneous E/e' and NT-BNP were recorded. Receiver operating characteristic analysis was used to assess the diagnostic accuracy of JVP, E/e' and NT-BNP for detecting elevated PWP by cath (≥ 15 mmHg). Analyses were stratified by the presence/absence of obesity (BMI >30).

Results: 157 exams were performed on 80 patients (62 \pm 12 years; 58% male; 45% obese). Overall diagnostic utility, as reflected by area under curve (AUC), was highest with BNP, lowest with E/e' and intermediate with JVP (Table). Optimal cut-off values for BNP and E/e' were dramatically lower in obese patients, whereas the cut-off of JVP was unchanged. Adjusting for age and sex, E/e' and BNP were lower in obese than non-obese patients at any given value of invasive PWP.

Conclusions: Obesity impacts the optimal cutoff values of E/e' and NT-BNP for the detection of elevated filling pressures. These findings suggest that body size should be taken into account for accurate interpretation of noninvasive measures of volume status.

ROC Analysis Stratified by Obesity

		Area Under Curve	P	Optimal Cutoff	Sensitivity(%)	Specificity (%)
Overall	JVP	0.72	<0.0001	10 cm	63	73
	E/e'	0.65	0.01	18	38	89
	NT-BNP	0.78	<0.0001	1900 pg/ml	59	90
Non-Obese	JVP	0.73	<0.001	10 cm	65	73
	E/e'	0.70	0.02	17	64	83
	NT-BNP	0.90	<0.0001	1450 pg/ml	93	83
Obese	JVP	0.71	0.01	10 cm	62	72
	E/e'	0.71	0.03	11	71	69
	NT-BNP	0.77	0.03	105 pg/ml	88	75