**BIOIMPEDANCE VECTOR ANALYSIS IN THE DIAGNOSIS OF ACUTE DECOMPENSATED HEART FAILURE IN THE EMERGENCY DEPARTMENT**

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Objectives: To determine the diagnostic utility of Bioimpedance Vector Analysis (BIVA) and its additive value to serum B-type natriuretic peptide (BNP) among dyspneic patients in the emergency department (ED).

Background: BIVA represents a novel and noninvasive means to assess volume status among inpatients with acute decompensated heart failure (ADHF). Whether it can be used to diagnose ADHF in undifferentiated dyspneic patients in the ED is less clear.

Methods: BIVA was performed to measure total body hydration percentage on 97 consecutive adult patients presenting to the ED with a chief complaint of dyspnea. Adjudication of ADHF was done retrospectively using Framingham criteria.

Results: 34 of the 97 patients enrolled had adjudicated ADHF. Unlike serum BNP, BIVA-derived hydration had no significant correlation with renal function. Patients with adjudicated ADHF had a significantly higher mean BIVA-derived hydration compared to those without ADHF (77.9% vs. 73.6%, p=0.038). An optimum BIVA-derived hydration of 78% was determined by the receiver operating characteristic curve (p=0.002). BIVA-derived hydration rates than 78% yielded an area under the curve (AUC) of 0.688 (95% CI: 0.574-0.809) for adjudicated ADHF. BNP alone produced an AUC of 0.84 (95% CI: 0.749-0.930) and the combination of BIVA-derived hydration with BNP yielded an AUC of 0.892

(95% CI: 0.815-0.970).

Conclusions: BIVA-derived hydration rate adds to the diagnostic accuracy of BNP in the diagnosis of ADHF in undifferentiated dyspneic patients in the ED and does not correlate with renal function.

