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## Correlation of natriuretic peptide to inferior vena cava compressibility and caval index in patients with dyspnea

Singh H, Gao L, Rehil N, Chen H, Heng T and Bajaj V  
West Suburban Medical Center, USA

**Background:** B-type natriuretic peptide (BNP) is a cardiac neurohormone produced from the ventricles in response to cardiomyocyte stretch in states of volume expansion and pressure overload. It is common practice to use inferior vena cava (IVC) diameter and the degree of inspiratory compressibility to predict volume status. IVC diameter varies with inspiration and expiration due to changes in intrathoracic pressures and this variation can be expressed as the caval index. The purpose of this study is to find any correlation between BNP levels of varying degree to IVC compressibility and caval index in general population presenting to the emergency department with dyspnea.

**Methods:** We examine 71 patients (32% males) admitted to the hospital between February 1, 2015 and April 30, 2015 with dyspnea. Patients had their BNP drawn the day of admission and underwent transthoracic echocardiography within 48 hours. They were excluded, if they received more than one dose of 40 mg IV furosemide and had GFR of less than 60 or creatinine of more than 2. The degree of association was measured using the Pearson Chi-square test and the Pearson product-moment correlation coefficient.

**Results:** The mean age and BMI was 63 years and 31.8 kg/m<sup>2</sup>, respectively. 29 patients (41%) had CHF with mean EF of 52%, 17 patients (24%) had COPD, 30 patients (42%) had pulmonary hypertension, 6 patients (8%) had pneumonia and 3 patients (4%) with pulmonary embolism. The average BNP is 556 pg/ml with mean creatinine and caval index of 1.43 and 29%. After performing a Pearson Chi-square test, the results suggest that IVC compressibility is independent of BNP ( $X^2=2.11$ ,  $P\text{-value}=0.347$ ). A linear relationship was assessed between continuous variables BNP and caval Index. As a result, the Pearson product-moment correlation coefficient suggests the relationship between BNP and caval index is technically positive, but weak ( $r=0.299$ ).

**Conclusion:** IVC compressibility is independent of BNP levels and the correlation between BNP and caval index is positive but weak.

jyotsingh13@gmail.com