CIRCULATING ENDOTHELIN-1 CONCENTRATION IN SYSTOLIC HEART FAILURE PATIENTS IS ASSOCIATED WITH BOTH CENTRAL SLEEP APNEA AND DIASTOLIC DYSFUNCTION

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Background: Central sleep apnea (CSA) affects >40% of heart failure (HF) patients and causes hypoxia. Hypoxia promotes endothelin-1 (ET-1) release which is associated with adverse prognosis in HF. We hypothesized plasma ET-1 is elevated in HF patients with CSA.

Methods: Consecutive ambulatory HF patients with left ventricular ejection fraction <35% were prospectively enrolled for measurement of ET-1 concentration, apnea-hypopnea index (AHI) and duration of arterial oxygen saturation <90% (T90%) by polysomnography (PSG). CSA was defined as AHI ≥15 after exclusion of obstructive sleep apnea; severity quantified by AHI and T90%. Diastolic dysfunction was estimated by ratio of mitral E velocity to medial anulus e´ velocity (E/e´).

Results: 42 subjects met inclusion criteria; 52% had CSA. Mean age was 64, 74% were men and 74% had class III HF. ET-1 concentration was higher in HF subjects with CSA than without CSA (2.6 vs 1.2 pg/mL, p<0.01) and correlated with AHI (r=0.44, p<0.01), T90% (r=0.37, p=0.02), and E/e´ (r=0.72, p<0.01). ET-1 concentration correlated with stratification by presence of CSA and magnitude of E/e´ (Fig, p<0.01). Multivariate regression demonstrated CSA (p=0.03), and severity of CSA (T90%, p=0.03; AHI, p=0.03) remained significantly associated with ET-1 concentration after controlling for E/e´ (p<0.01).

Conclusion: ET-1 concentration is elevated in systolic HF patients with CSA and appears independently related to severity of diastolic dysfunction and presence and severity of CSA.

![Graph showing ET-1 concentration comparison between CSA and no CSA groups](image-url)