



Arrhythmias

THE EFFECT OF ACUTE VOLUME CHANGES ON HEART RATE VARIABILITY

ACC Moderated Poster Contributions
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Background: Heart rate variability (HRV) measurements provide a low-cost, physiological, non-invasive method for assessing cardiac autonomic function. Lower than normal HRV values are typical in patients with advanced chronic systolic heart failure (HF) (NYHA III-IV), and have been shown to be associated with a higher occurrence of sudden death in these patients. There is limited data investigating whether acute HRV measurements may be useful in predicting CHF decompensation in patients with chronic systolic heart failure. Current biventricular devices have the ability to monitor HRV (time domain measures) on a daily basis. Furthermore, HRV measurements have never been correlated to acute changes in volume, which may help predict and guide heart failure management on a daily basis.

Methods: We measured time domain measure standard deviation of N-N intervals (SDNN), Normal = 141 ± 39 using a Philips Zymed Holter 2120 Plus over 30 minutes in supine position pre and post high intensity diuresis in 11 patients who presented to the heart failure infusion clinic with volume overload for their initial treatment session. Patients standing weight and volume loss pre and post diuresis was measured. Paired T-test and Pearson's correlation was performed to analyze pre and post diuresis values.

Results: The average age was 60 ± 10 yrs and with 9 males (80%). The mean LVEF was $35 \pm 8\%$. All patients were in NYHA class III HF. The mean pre diuresis BNP was 434 ± 421 . The average pre- and post diuresis weight was 232 ± 60 lbs and 229 ± 59 lbs. The mean pre and post-diuresis SDNN was 64 ± 64 ms and 89 ± 71 ms. The average volume lost was 1175 ± 403 ml. On paired T test there was a mean improvement of 24 ± 34 in SDNN ($p = 0.038$). The average decrease in weight was $2.3 \text{ lbs} \pm 0.9$ ($p = 0.001$). There was a correlation between volume loss and improvement in HRV ($r = 0.66$, $p\text{-value} = 0.038$).

Conclusions: There is statistically significant improvement in heart rate variability with diuresis, which closely correlated with volume loss. Thus, it is possible to acutely alter SDNN with diuresis. It remains to be investigated whether acute changes in volume and HRV may help guide outpatient management of HF through the use of current and future CRM devices