The Benefits of Ambulatory Pulmonary Artery Pressure Monitoring in Patients with Heart Failure

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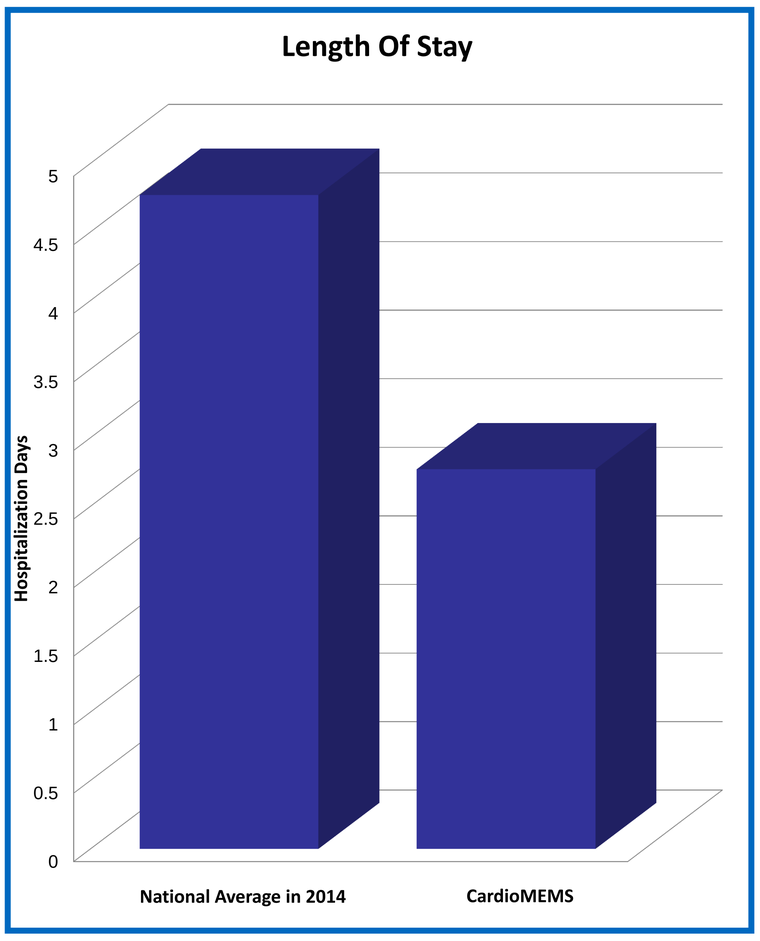
Background

The CHAMPION trial showed a reduction in CHF hospitalizations with the utilization of the CardioMEMS device. The CardioMEMS device provides daily pulmonary artery pressures, which are analyzed with clinical signs and symptoms to help investigators adjust guideline directed medical therapy and reduce recurrent hospitalizations. We hope to expand on this trial but relating it to other variables of volume status and correlate it to the patient population we currently serve.

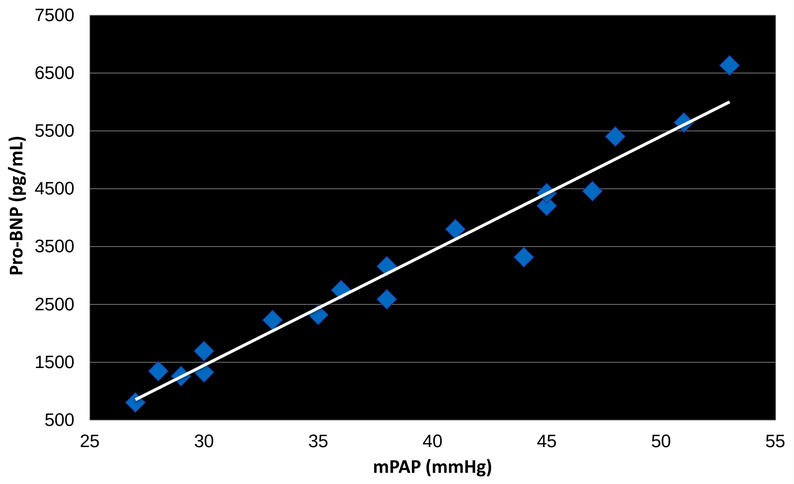
Methods

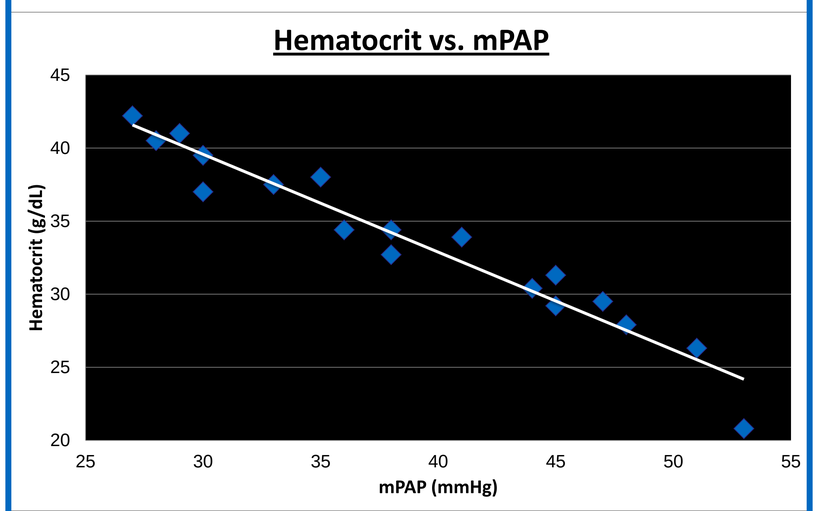
We retrospectively investigated 17 CardioMEMS patients who were hospitalized after device placement over a course of 1 year for CHF exacerbation. We followed them from baseline to hospitalization to discharge to clinic follow up while monitoring several variables, including pulmonary artery pressures, creatinine, pro-BNP, hematocrit, iron levels and body weight. All data was primarily collected via the Merlin.net™ Patient Care Network - Heart Failure Management Database and EPIC EMR. Necessary diuretic regimens were adjusted according to these variables.



Graphs

Admission:





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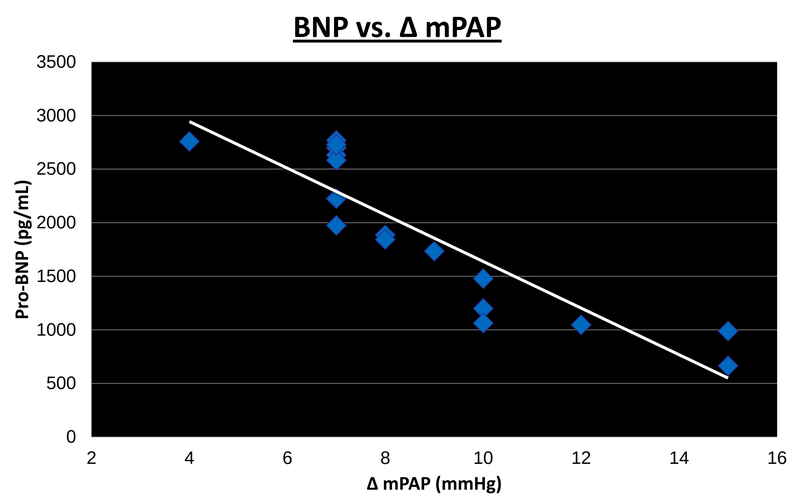

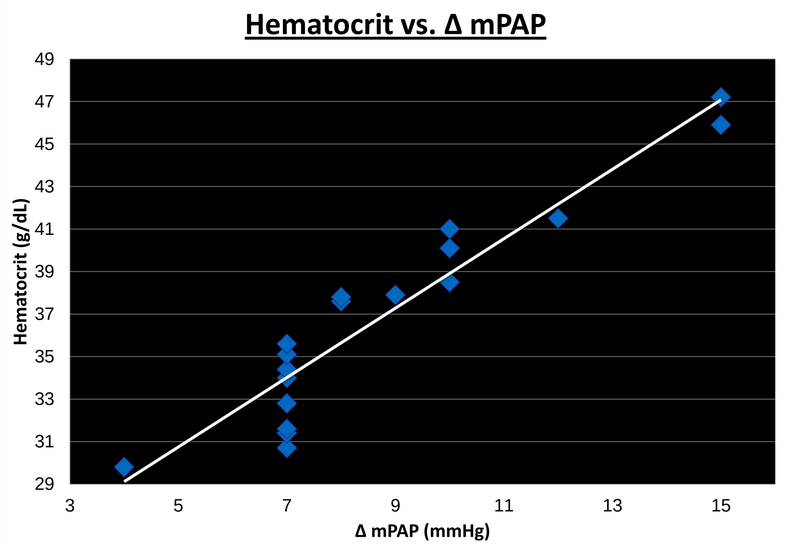

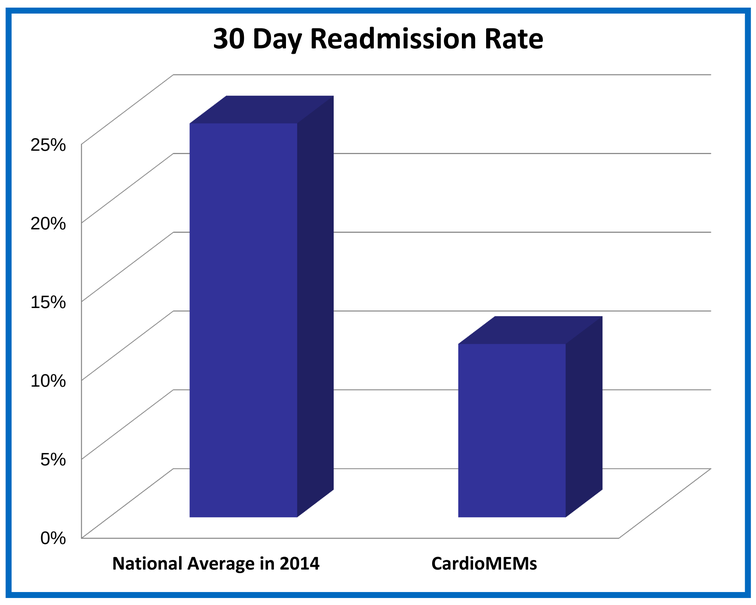

Results

Our analysis showed a direct correlation with pulmonary artery pressure with pro-BNP and body weight and an inverse relationship with creatinine, iron levels, and hematocrit at the time of admission suggesting evidence of volume overload and increased ventricular wall stress. Pro-BNP displayed a strong, positive, relative linear relationship (Pearson Correlation of 0.609 and r of 0.63) and hematocrit had a similar inverse (strong, negative, linear) (Pearson Correlation of 0.713 and r of -0.58) relationship with mean pulmonary artery pressure, compared to the other variables. These variable displayed a similar inverse relationship as patients were adequately diuresed during their hospitalization and subsequently discharged home. We also saw 42% reduction in length of hospital stay and 56% 30 day readmission rates in our study patient population.

Conclusion

Our retrospective analysis confirmed that results endorsed by the CHAMPION trial by showing a significant reduction in hospitalization of our CardioMEMS patients. Concurrently, we also advocate the benefit of Pro-BNP and hematocrit levels as strong correlating factors to determine volume status.

References:

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