

# Exploring Brain Natriuretic Peptide as a Surrogate Marker of Subclinical Heart Disease in Emergency Patients with Asymptomatic Hypertension: Preliminary Results



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ABSTRACT

EMAN RASHID

KIMBERLY SOUFFRONT

\*Author affiliations can be found in the back matter of this article



**Background:** Nearly half of patients who visit the emergency department (ED) in the United States have asymptomatic hypertension (HTN), and this disproportionately affects Black patients. Subclinical heart disease (SHD) (systolic and/or diastolic dysfunction) is prevalent in these patients (45%–93%), leading to conditions such as congestive heart failure (CHF). Identifying a blood biomarker that may serve as a surrogate for detecting SHD may improve vigilance with follow up to primary care from the ED for treatment, and the development of secondary complications.

**Study Objectives:** Brain natriuretic peptide (BNP) levels well below contemporary thresholds used for the diagnosis of CHF are associated with adverse cardiovascular outcomes in community patients with asymptomatic HTN. The objective of this study is to determine the diagnostic accuracy of BNP for predicting echocardiographic evidence of SHD in emergency patients with asymptomatic uncontrolled HTN.

**Study Design/Methods:** This is a prospective observational ongoing proof of concept study. A series of sample calculations determined a convenience sample of  $N = 76$  is necessary to achieve our objective. Adults ( $\geq 18$  years old) who have asymptomatic (i.e., no chest pain) HTN ( $BP \geq 160/100$  mmHg and  $2nd \geq 140/90$  mmHg) are being recruited from an urban academic ED in New York City. Patients with a history of CHF, renal insufficiency, and cardiovascular comorbidity, are excluded. BNP levels are categorized into high and low BNP levels, according to values above and below the 80th percentile (BNP 20 pg/ml for men and BNP 23.3 pg/ml for women). EKG evidence of left ventricular hypertrophy (LVH) by Cornell Voltage Criterion and evidence of SHD, defined as having diastolic or systolic dysfunction by bedside echocardiogram, are collected. Preliminary results are described.

**Results/Findings:** A total of 34 patients have been recruited as of September 2022. A majority are young (mean age 48 (SD 14.02), non-white ( $n = 31$ ; 91%) females ( $n = 19$ , 56%). Two patients were missing an echocardiogram, leaving 32 participants for analysis. Of the 32 participants, 100% have evidence of SHD and  $n = 29$  also had a BNP lab test (3 missing). Fifteen (52%) of 29 participants have an abnormal BNP. Very few ( $n = 3$ , 9.6%) have EKG evidence of LVH. No bivariate analyses were completed on this small cohort of patients.

**Conclusion:** Subclinical heart disease is ubiquitous in emergency patients with asymptomatic hypertension, a larger proportion being non-white. A receiver operator curve will be calculated to predict echocardiographic evidence of SHD on BNP lab test.

**CORRESPONDING AUTHOR:**  
Kimberly Souffront, PhD, RN,  
FNP-BC

Associate Director, Center for Nursing Research and Innovation, Mount Sinai Health System, US; Core Faculty, Institute for Health Equity Research, US; Assistant Professor, Department of Emergency Medicine, Icahn School of Medicine at Mount Sinai Hospital, US; Adjunct Assistant Professor, Philips School of Nursing at Mount Sinai, US

[kimberly.souffront@mountsinai.org](mailto:kimberly.souffront@mountsinai.org)

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## COMPETING INTERESTS

The authors have no competing interests to declare.

## AUTHOR AFFILIATIONS

### Eman Rashid

Student, Hunter-Bellevue School of Nursing, US

### Kimberly Souffront, PhD, RN, FNP-BC

Associate Director, Center for Nursing Research and Innovation, Mount Sinai Health System, US; Core Faculty, Institute for Health Equity Research, US; Assistant Professor, Department of Emergency Medicine, Icahn School of Medicine at Mount Sinai Hospital, US; Adjunct Assistant Professor, Philips School of Nursing at Mount Sinai, US

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