

Abstract

Aims: N-terminal pro-brain natriuretic peptide (NT-proBNP) measurements can be used to rule out heart failure in patients with sinus rhythm. Atrial fibrillation (AF) often coexists with heart failure but affects NT-proBNP levels. This study aims to identify the optimal NT-proBNP cut-off value for ruling out heart failure among AF patients.

Methods and results: This prospective study included AF patients admitted to the emergency department. The inclusion criterion was documented AF on a 12-lead electrocardiogram. All patients completed a NT-proBNP blood sample, a chest X-ray, and an echocardiogram. Heart failure was defined as a left ventricular ejection fraction of <40%. In total, 409 patients were included (mean age: 75.2 ± 11.6). The median NT-proBNP level was 2,577 ng/L (quartiles: 1,185-5,438) and 21% had heart failure. We found a lower median NT-proBNP level of $3,187 \pm 3,973$ ng/L in patients without heart failure compared to $9,254 \pm 8,008$ ng/L in patients with heart failure (absolute difference: 4,131, 95% (CI): 3,299-4,986, $p < 0.001$). The area under the receiver operating characteristic curve for diagnosing heart failure was 0.82 (95% confidence interval: 0.77 -0.87). The optimal cut-off value for ruling out heart failure was 739 ng/L with a sensitivity of 99%, a specificity of 18%, and a negative predictive value of 98%.

Conclusion: NT-proBNP can be used to rule out heart failure in AF patients with a high negative predictive value, but low specificity (Clinicaltrials.gov: NCT04125966).

Keywords: Atrial fibrillation, heart failure, NT-proBNP, biomarker, emergency department