

INTISARI

Latar belakang: Gagal jantung akut sering disertai penurunan fungsi ginjal akibat interaksi kardiorrenal yang saling memperburuk. NT-proBNP merupakan biomarker utama untuk menilai tekanan intrakardiak, namun kadarnya dapat meningkat akibat gangguan filtrasi ginjal. Sebaliknya, Cystatin C merupakan indikator fungsi ginjal yang lebih sensitif dan tidak dipengaruhi usia, jenis kelamin, maupun massa otot. Namun, kontribusi relatif antara gangguan fungsi ginjal dan peningkatan tekanan intrakardiak terhadap kadar NT-proBNP belum sepenuhnya jelas pada populasi gagal jantung akut. Oleh karena itu, pemahaman hubungan antara Cystatin C dan NT-proBNP menjadi penting untuk menilai interaksi kardiorrenal secara lebih akurat pada konteks klinis tersebut.

Tujuan: Penelitian ini bertujuan untuk mengetahui hubungan antara kadar NT-proBNP dan Cystatin C pada pasien gagal jantung akut di RSUP Dr. Sardjito.

Metode penelitian: Penelitian observasional potong lintang pada pasien gagal jantung akut tanpa sindrom koroner akut yang dirawat di IGD dan menjalani pemeriksaan Cystatin C serta NT-proBNP selama Agustus 2023–Agustus 2024. Analisis korelasi dilakukan menggunakan korelasi Spearman sesuai distribusi data, dengan $p < 0,05$ dianggap bermakna.

Hasil : Penelitian ini melibatkan 91 pasien gagal jantung akut yang menjalani pemeriksaan NT-proBNP dan Cystatin C dalam 24 jam awal perawatan di IGD dan ruang intensif RSUP Dr. Sardjito. Rerata usia subjek adalah $56,4 \pm 14,3$ tahun dengan mayoritas laki-laki (63,7%). Median NT-proBNP dan Cystatin C masing-masing sebesar 8.464 pg/mL dan 1,69 mg/L. Analisis korelasi menunjukkan adanya hubungan positif yang bermakna antara NT-proBNP dan Cystatin C ($\rho=0,319$; $p=0,002$). Korelasi signifikan terutama ditemukan pada subkelompok usia ≥ 60 tahun ($\rho=0,50$), laki-laki ($\rho=0,394$), LVEF $< 40\%$ ($\rho=0,427$), BMI ≥ 25 kg/m² ($\rho=0,61$), dan pasien dengan riwayat merokok ($\rho=0,45$), sedangkan pada subkelompok lainnya korelasi tidak bermakna.

Simpulan: Adanya korelasi positif antara kadar Cystatin C dan NT-proBNP dengan kekuatan korelasi lemah hingga sedang pada pasien dengan gagal jantung akut.

Kata kunci: Gagal jantung akut, NT-proBNP, Cystatin C

ABSTRACT

Background: Acute heart failure is often accompanied by a decline in renal function due to a mutually exacerbating cardiorenal interaction. NT-proBNP is the primary biomarker for assessing intracardiac pressure, but its levels may increase due to impaired renal filtration. In contrast, Cystatin C is a more sensitive indicator of renal function and is not affected by age, gender, or muscle mass. However, the relative contribution of renal dysfunction and increased intracardiac pressure to NT-proBNP levels remains unclear in the acute heart failure population. Therefore, understanding the relationship between Cystatin C and NT-proBNP is important for more accurately assessing cardiorenal interactions in this clinical context.

Objective: This study aims to investigate the relationship between NT-proBNP and Cys C levels in patients with acute heart failure at Dr. Sardjito General Hospital.

Methods: A cross-sectional observational study of patients with acute heart failure without acute coronary syndrome who were treated in the emergency department and underwent Cystatin C and NT-proBNP testing between August 2023 and August 2024. Correlation analysis was performed using Pearson or Spearman depending on the data distribution, with $p < 0.05$ considered significant.

Results: This study involved 91 patients with acute heart failure who underwent NT-proBNP and Cystatin C testing within the first 24 hours of treatment in the emergency department and intensive care unit of Dr. Sardjito General Hospital. The mean age of the subjects was 56.4 ± 14.3 years, with the majority being male (63.7%). The median NT-proBNP and Cystatin C levels were 8,464 pg/mL and 1.69 mg/L, respectively. Correlation analysis showed a significant positive relationship between NT-proBNP and Cystatin C ($\rho = 0.319$; $p = 0.002$). Significant correlations were mainly found in the subgroup aged ≥ 60 years ($\rho = 0.50$), males ($\rho = 0.394$), LVEF $< 40\%$ ($\rho = 0.427$), BMI ≥ 25 kg/m² ($\rho = 0.61$), and patients with a history of smoking ($\rho = 0.45$), while in other subgroups the correlation was not significant.

Conclusion: There is a positive correlation between Cystatin C and NT-proBNP levels with weak to moderate correlation strength in patients with acute heart failure.

Keywords: Acute heart failure, NT-proBNP, Cystatin C