

INTISARI

HUBUNGAN ANTARA *STRAIN* ATRIUM KIRI, KADAR PENANDA NT-PROBNP DENGAN DERAJAT DISFUNGSI DIASTOLIK VENTRIKEL KIRI PADA PASIEN GAGAL JANTUNG

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Latar Belakang: Disfungsi diastolik sering dijumpai pada gagal jantung baik dengan fraksi ejeksi yang normal maupun menurun. Prevalensinya semakin meningkat dan melebihi disfungsi sistolik. Ekokardiografi merupakan modalitas utama penilaian fungsi diastolik. Diagnosis disfungsi diastolik menggunakan ekokardiografi seringkali cukup sulit dan kompleks. *Strain* atrium kiri dengan *speckle tracking echocardiography* (STE) dua dimensi dan kadar NT-proBNP diharapkan dapat memperkirakan perubahan fungsional pada atrium kiri. Dimana diharapkan *strain* atrium kiri dan kadar NT-proBNP dapat digunakan sebagai parameter tambahan penanda disfungsi diastolik pada pasien gagal jantung.

Tujuan: Penelitian ini bertujuan untuk mengetahui hubungan *strain* atrium kiri, kadar NT-proBNP dengan derajat disfungsi diastolik pada pasien gagal jantung

Metode: Penelitian observasional potong lintang dan mengambil data secara restrospektif ini mencakup data dari 84 pasien berusia ≥ 18 tahun dengan diagnosis gagal jantung yang dirawat di bangsal jantung RSUP Dr. Sardjito, Yogyakarta, Indonesia dari Januari 2020 hingga Mei 2022 dan telah menjalani pemeriksaan TTE dan Kadar NT-proBNP. *Strain* atrium kiri (diukur pada video TTE) dan Kadar NT-proBNP dianalisis untuk melihat hubungannya dengan derajat disfungsi diastolik.

Hasil: Terdapat hubungan antara *strain* atrium kiri dan derajat disfungsi diastolik pada pasien gagal jantung dengan nilai $p < 0,001$, dimana penurunan nilai *strain* atrium kiri berhubungan dengan semakin memberatnya derajat disfungsi diastolik. Sedangkan kadar NT-proBNP tidak berhubungan dengan derajat disfungsi diastolik nilai $p = 0,523$. *Strain* atrium kiri pada kelompok disfungsi diastolik derajat 1 dan 2 tidak berbeda signifikan, tetapi memiliki perbedaan yang signifikan dengan nilai $p < 0,001$ jika dibandingkan kelompok disfungsi diastolik derajat 3. Nilai batas *strain* atrium kiri sebesar $\leq 7,57\%$ didapatkan dari analisis ROC sebagai *cut-off* untuk menilai disfungsi diastolik derajat 3. *Strain* atrium kiri sebesar $\leq 7,57\%$ memiliki akurasi dalam mendiagnosis disfungsi diastolik derajat 3 lebih tinggi dibandingkan nilai *strain* atrium kiri $> 7,57\%$ (OR = 5,5, 95% IK=1,04-14,67; $p < 0,001$).

Kesimpulan: *strain* atrium kiri berhubungan dengan derajat disfungsi diastolik ventrikel kiri. Sedangkan kadar NT-proBNP tidak berhubungan dengan derajat disfungsi diastolik.

Kata Kunci: *strain* atrium kiri, *speckle tracking echocardiography* (STE), NT-proBNP, derajat disfungsi diastolik, gagal jantung

ABSTRACT

RELATIONSHIP BETWEEN LEFT ATRIAL STRAIN, LEVELS OF NT-PROBNP WITH THE DEGREE OF LEFT VENTRICULAR DIASTOLIC DYSFUNCTION IN PATIENTS WITH HEART FAILURE

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Background: Diastolic dysfunction is often found in heart failure with either preserved or reduced ejection fraction. Its prevalence is increasing and exceeds that of systolic dysfunction. Echocardiography is the main modality for assessing diastolic function. The diagnosis of diastolic dysfunction using echocardiography is quite difficult and complex. Left atrial strain assessed using speckle tracking echocardiography (STE) two-dimensional and NT-proBNP levels was expected as an affordable marker for left atrial function and can be performed on routine examinations. These two parameteres are considered as an additional parameter to assess the degree of diastolic dysfunction in heart failure patients.

Objective: This study aims to determine the relationship between left atrial strain, NT-proBNP levels, and the degree of diastolic dysfunction in heart failure patients.

Methods: This was a cross-sectional observational study and took data retrospectively. This study included data from 84 patients aged ≥ 18 years with a diagnosis of heart failure who had been admitted to the cardiac ward of RSUP Dr. Sardjito, Yogyakarta, Indonesia from January 2020 to May 2022 and has been performed TTE and simple blood test to measure NT-proBNP levels. Left atrial strain (measured on TTE video) and NT-proBNP levels were analyzed for their relationship to the degree of diastolic dysfunction.

Results: Decrease in left atrial strain value was associated with a worsening degree of diastolic dysfunction in heart failure patients with p value $< 0,001$. Meanwhile, the level of NT-proBNP was not related to the degree of diastolic dysfunction, p value = 0,523. left atrial strain in grade 1 and 2 diastolic dysfunction groups were not significantly different but had a significant difference with p value $< 0,001$ when compared to the grade 3 diastolic dysfunction group. The left atrial strain of $\leq 7,57\%$ was obtained from ROC analysis as the cut-off to assess grade 3 diastolic dysfunction. Left atrial strain $\leq 7,57\%$ had a higher accuracy in diagnosing grade 3 diastolic dysfunction than left atrial strain $> 7,57\%$ (OR = 5,5; 95% CI = 1,04-14,67; p $< 0,001$).

Conclusion: left atrial strain associated with the degree of left ventricular diastolic dysfunction. Meanwhile, NT-proBNP levels were not associated with the degree of diastolic dysfunction.

Keywords: left atrial strain, speckle tracking echocardiography (STE), NT-proBNP, degree of diastolic dysfunction, heart failure