

# Hubungan left atrial volume index dan heart rate variability dengan gagal jantung pada pasien fibrilasi atrium = Association between left atrial volume index and heart rate variability with heart failure in atrial fibrillation patients

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## Abstrak

Latar belakang: Angka morbiditas dan mortalitas meningkat pada pasien fibrilasi atrium (FA) yang mengalami gagal jantung akut. Pada pasien irama sinus, left atrial volume index (LAVI) dan heart rate variability (HRV) merupakan prediktor kuat terjadinya komplikasi kardiovaskular. Penelitian LAVI dan HRV pada pasien FA hingga saat ini belum konklusif.

Tujuan: Mengetahui hubungan LAVI dan HRV dengan kejadian gagal jantung akut pada pasien FA

Metode: Studi kohort retrospektif dengan populasi terjangkau pasien dewasa FA di Rumah Sakit dr. Cipto Mangunkusumo (RSCM) 1 Januari 2020 hingga 31 Desember 2021 yang berasal dari registri Optimal INR measures for Indonesians (OPTIMA). Data sekunder LAVI diukur dengan ekokardiografi dan parameter HRV terdiri dari standar deviation of NN intervals (SDNN), root mean square of successive differences (RMSSD), rasio low frequency dan high frequency (LF/HF) diukur menggunakan alat HRV portabel. Pasien diikuti hingga 30 Januari 2023, luaran dinilai dengan melihat catatan medik atau melalui telepon.

Hasil: Dilakukan analisis pada 144 sampel. Proporsi kejadian gagal jantung akut sebesar 15,3%. Tidak terdapat hubungan antara SDNN dengan kejadian gagal jantung akut (RR 1,75; IK95% 0,260 – 11,779, p=0,565). Tidak terdapat hubungan antara LF/HF dengan kejadian gagal jantung akut (RR 2,865; IK 95% 0,765 – 10,732, p=0,118). Terdapat hubungan antara LAVI dengan kejadian gagal jantung akut (adjusted RR 2,501; IK 95% 1,003 – 6,236, p=0,049). Diabetes melitus dan hipertensi merupakan faktor perancu pada penelitian ini.

Kesimpulan: Peningkatan LAVI berhubungan dengan kejadian gagal jantung akut pada pasien FA. HRV tidak berhubungan dengan kejadian gagal jantung akut pada pasien FA.

.....Background Morbidity and mortality rates increase in patients with atrial fibrillation (AF) who experience acute heart failure. In patients with sinus rhythm, left atrial volume index (LAVI) and heart rate variability (HRV) are strong predictors of cardiovascular complications. Research on LAVI and HRV in AF patients has so far not been conclusive.

Objectives: To determine the relationship between LAVI and HRV and the incidence of acute heart failure in AF patients.

Methods: A retrospective cohort study was conducted with an accessible population of adult AF patients at RSCM from January 1, 2020, to December 31, 2021, originating from the Optimal measures INR for Indonesians (OPTIMA) registry. LAVI was measured by echocardiography, and HRV parameters consist of the standard deviation of NN intervals (SDNN), the root mean square of successive differences (RMSSD), and the ratio of low frequency and high frequency (LF/HF) measured using a portable ECG device. Patients were followed until January 30, 2023, and outcomes were assessed by looking at medical records or by telephone.

Result: A total of 144 subjects were analysed. The proportion of acute heart failure is 15.3%. There was no

relationship between SDNN and the incidence of acute heart failure (RR 1.75; 95% CI 0.260–11.779,  $p=0.565$ ). There was no relationship between LF/HF and the incidence of acute heart failure (RR 2.865; 95% CI 0.765–10.732,  $p=0.118$ ). There is a relationship between LAVI and the incidence of acute heart failure (adjusted RR 2.501; 95% CI 1.003–6.236,  $p = 0.049$ ). DM and hypertension were confounding factors in this study.

Conclusion: The elevation of LAVI is associated with the incidence of acute heart failure in AF patients. HRV is not associated with the incidence of acute heart failure in AF patients.