

# Prediktor Kejadian Gagal Jantung Akut pada Pasien COVID-19 = Predictors of Acute Heart Failure in Hospitalized COVID-19 Patients

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## Abstrak

Latar Belakang: Infeksi COVID-19 merupakan penyakit dengan komplikasi multi-organ, salah satunya komplikasi kardiovaskular. Dengan kejadian gagal jantung akut sebagai komplikasi COVID-19 dengan mortalitas dan morbiditas yang tinggi, perlu dilakukan identifikasi faktor-faktor yang berhubungan dengan terjadinya gagal jantung akut pada pasien COVID-19, khususnya pada derajat sedang – berat.

Tujuan : Mengetahui prediktor gagal jantung akut pada pasien COVID-19 yang dirawat, khususnya derajat sedang – berat

Metode : Metode penelitian bersifat kohort retrospektif. Luaran primer adalah kejadian gagal jantung akut saat perawatan. Terdapat 15 faktor klinis dan laboratoris yang dianalisis secara bivariat dan multivariat.

Hasil: Dari total 208 subjek sesuai kriteria inklusi dan eksklusi, sebanyak 73 subjek (35%) mengalami episode gagal jantung akut saat perawatan. Riwayat gagal jantung kronik memiliki risiko 5,39 kali (95% IK: 1,76 – 16,51;  $p = 0,003$ ) mengalami kejadian gagal jantung akut. Pasien dengan nilai TAPSE < 17 mm memiliki risiko 4,25 kali (95% IK: 1,13 – 16,07;  $p = 0,033$ ) mengalami gagal jantung akut. Sedangkan pemakaian ACE-i/ARB memiliki risiko 0,16 kali (95% IK: 0,05 – 0,51;  $p = 0,002$ ) untuk mengalami gagal jantung akut intraperawatan dibandingkan kelompok tanpa pemakaian ACE-i/ARB.

Kesimpulan: Riwayat gagal jantung kronik, TAPSE < 17 mm, dan pemakaian ACE-i/ARB diidentifikasi sebagai prediktor kejadian gagal jantung akut pada pasien COVID-19.

.....Introduction: COVID-19 infection is a disease with multi-organ complications, including cardiovascular organ. As heart failure is one of COVID – 19 complications that has high morbidity and mortality, we need to identify factors that can predict acute heart failure in COVID – 19, especially in moderate to severe patients.

Objective : to determine predictors of acute heart failure in hospitalized COVID -19 patients

Method : This was a retrospective cohort study. The primary outcome was acute heart failure that happened during hospitalization. There were total of 16 clinical (age, sex, body mass index, hypertension, diabetes, smoking history, coronary artery disease, chronic kidney disease, chronic heart failure, chronic obstructive pulmonary disease, PaO<sub>2</sub>/FiO<sub>2</sub> ratio, non-cardiogenic shock at admission, use of ACE-inhibitors/ARBs during hospitalization, ejection fraction, TAPSE) as well as 6 laboratory parameters (neutrophil - lymphocyte ratio, platelet - lymphocyte ratio, eGFR, D-Dimer, procalcitonin, CRP) that were used in statistical analysis.

Result: From total of 208 subjects with moderate – severe COVID-19, 73 (35%) had acute heart failure. The median time of developing heart failure is 4 ( 1 - 27) days. On multivariate analysis, patients with history of chronic heart failure exhibited a 5.39-fold higher risk of acute heart failure compared with no history of chronic heart failure (95% CI: 1.76 – 16.51;  $p = 0.003$ ). The risk of acute heart failure was multiplied by 4.25 in patients that was presented with TAPSE <17 mm (95% CI: 1.13 – 16.07;  $p = 0.033$ ). In contrast, use/continuation of ACE-inhibitors/angiotensin receptor blockers during hospitalization showed reduced

risk of acute heart failure (16% of the risk developing acute heart failure compared with patients with no use of ACE-inhibitors/angiotensin receptor blockers). In subjects developing acute heart failure, the mortality rate was 67%, compared with 57% in subjects without acute heart failure ( $p = 0,028$ ).

Conclusion: History of chronic heart failure, TAPSE  $<17$  mm, and the use of ACE-inhibitors/angiotensin receptor blockers were identified as predictors of acute heart failure in hospitalized COVID-19 patients.