



## INTISARI

**Latar belakang:** Pasien COVID-19 berisiko mengalami proses inflamasi hebat (badai sitokin). Badai sitokin ini menyebabkan hipoalbuminemia kritis dan meningkatkan risiko kematian. Biomarker keadaan inflamasi dengan menggunakan rasio CRP dan albumin merupakan perbandingan reaktan inflamasi fase akut positif terhadap reaktan fase akut negatif dan memiliki potensi dalam menggambarkan keadaan inflamasi dan status nutrisi penderita. Rasio ini diperkirakan dapat menjadi prediktor mortalitas pasien COVID-19.

**Tujuan:** Penelitian ini bertujuan mengevaluasi nilai *C-reactive protein to albumin ratio* (CAR) dengan *cut off* > 11,4 sebagai prediktor kematian pada pasien COVID-19 yang dirawat RSUP Dr. Sardjito.

**Metode:** Penelitian dilakukan secara *retrospective cohort* pada pasien COVID-19 di RSUP Dr. Sardjito. Subjek penelitian dibagi menjadi kelompok terpapar (pasien dengan CAR > 11,4) dan kelompok tidak terpapar (pasien dengan CAR ≤ 11,4), kemudian diamati ada atau tidak adanya kematian saat keluar rumah sakit. Resiko kematian dianalisis dengan resiko relatif. Analisis kesintasan pada kedua kelompok dilakukan *survival analysis* dengan Kaplan-Meier

**Hasil:** Jumlah subjek sebanyak 255 pasien. Tiga belas pasien dikeluarkan sesuai kriteria eksklusi sehingga didapatkan 242 pasien yang akan dianalisis. Kelompok dengan nilai CAR > 11,4 yang mengalami kematian sebanyak 184 (52,2%) sedangkan kelompok lain (CAR ≤ 11,4) yang mengalami kematian 14 (17,3%). Analisis survival kelompok pasien dengan nilai CAR > 11,4. Memiliki risiko (HR) kematian 3,26 kali dibanding kelompok dengan nilai CAR ≤ 11,4.

**Simpulan:** Pasien COVID-19 dengan nilai CAR > 11,4 memiliki risiko kematian sekitar 3 kali lebih tinggi dibanding pasien dengan nilai CAR ≤ 11,4

**Kata kunci:** COVID-19, *C-reactive protein to albumin ratio* (CAR), kematian



## ABSTRACT

**Background:** COVID-19 patients are at risk of severe inflammatory processes (cytokine storms). This cytokine storm causes critical hypoalbuminemia and increases the risk of death. Biomarkers of the inflammatory state using the ratio of CRP and albumin are a ratio of positive acute phase inflammatory reactants to negative acute phase reactants and have the potential to describe the inflammatory state and nutritional status of patients. This ratio is thought to be a predictor of mortality for COVID-19 patients.

**Objective:** This study aims to evaluate the value of *C-reactive protein to albumin ratio* (CAR) with a *cut off*  $> 11.4$  as a predictor of death in COVID-19 patients treated at Dr. Sardjito Hospital.

**Methods:** The study was conducted as a *retrospective cohort* in COVID-19 patients at Dr. Sardjito General Hospital. The study subjects were divided into exposed groups (patients with  $CAR > 11.4$ ) and unexposed groups (patients with  $CAR \leq 11.4$ ), then observed for the presence or absence of death at hospital discharge. The risk of death was analyzed by relative risk. Survival analysis in both groups was performed by Kaplan-Meier *survival analysis*.

**Results:** The total number of subjects was 255 patients. Thirteen patients were excluded according to the exclusion criteria, resulting in 242 patients to be analyzed. The group with a CAR value  $> 11.4$  who experienced death were 184 (52.2%) while the other group ( $CAR \leq 11.4$ ) experienced death 14 (17.3%). Survival analysis of patient groups with CAR values  $> 11.4$ . Has a risk (HR) of death 3.26 times compared to the group with a CAR value of  $\leq 11.4$ .

**Conclusion:** COVID-19 patients with CAR values  $> 11.4$  have a risk of death about 3 times higher than patients with CAR values  $\leq 11.4$

**Keywords:** COVID-19, *C-reactive protein to albumin ratio* (CAR), mortality