

## ABSTRACT

### **ASSOCIATION BETWEEN ALVEOLAR-ARTERIAL OXYGEN PRESSURE DIFFERENCE (AaDO<sub>2</sub>) AND LACTATE LEVEL WITH THE MORTALITY OF ADULT COVID-19 PATIENTS IN RSUP DR. SARDJITO: A RETROSPECTIVE COHORT STUDY**

**BACKGROUND:** Mortality in COVID-19 patients is often related to respiratory failure and multiple organ dysfunction. High Alveolar-Arterial Oxygen Pressure Difference (AaDO<sub>2</sub>) and high lactate level are associated with COVID-19 mortality as they can be assessed quickly in clinical settings and are able to indicate respiratory failure and organ dysfunction, respectively.

**OBJECTIVE:** This study aims to determine the association between AaDO<sub>2</sub> and lactate level with the mortality of adult patients with severe and critical COVID-19 in RSUP Dr. Sardjito.

**METHODS:** This is a retrospective cohort study involving adult hospitalized severe and critical COVID-19 patients in RSUP Dr. Sardjito from April 2021 until October 2021. The independent variables are AaDO<sub>2</sub> and lactate level whereas the dependent variable is COVID-19 mortality. The data is obtained from medical records. A cut-off point of the independent variables is determined using the ROC curve. The association between the variables is tested with Pearson Chi-square analysis and multivariate analysis using logistic regression.

**RESULTS:** Data from 270 patients are analyzed. The Pearson Chi-square analysis between AaDO<sub>2</sub> and lactate towards mortality showed relative risk of 2.418 (95%CI 1.483 to 3.940; p-value < 0.001) and 0.717 (95%CI 0.387 – 1.331; p-value insignificant), respectively. A multiple logistic regression involving independent variables and potential confounders showed a statistically significant association between AaDO<sub>2</sub>, shock, and epinephrine towards mortality, with the adjusted relative risk Exp(B) of 2.849, 26.702, and 9.803, respectively.

**CONCLUSION:** There is an association between AaDO<sub>2</sub> with the mortality of COVID-19 patients while there is no association between lactate with mortality.

**KEYWORDS:** COVID-19, high AaDO<sub>2</sub>, high lactate level, mortality, retrospective cohort study.

## INTISARI

### **ASOSIASI ANTARA PERBEDAAN TEKANAN OKSIGEN ALVEOLAR-ARTERIAL (AaDO<sub>2</sub>) DAN KADAR LAKTAT DENGAN MORTALITAS PASIEN COVID-19 DEWASA DI RSUP DR. SARDJITO: STUDI KOHOR RETROSPEKTIF**

**LATAR BELAKANG:** Kematian pada pasien COVID-19 sering dikaitkan dengan gagal napas dan disfungsi organ. Perbedaan Tekanan Oksigen Alveolar-Arterial (AaDO<sub>2</sub>) yang tinggi dan tingkat laktat yang tinggi dikaitkan dengan kematian akibat COVID-19 karena keduanya dapat dinilai dengan cepat dalam pengaturan klinis dan masing-masing dapat menunjukkan gagal napas dan disfungsi organ.

**TUJUAN:** Penelitian ini bertujuan untuk mengetahui hubungan antara AaDO<sub>2</sub> dan kadar laktat dengan mortalitas pasien dewasa dengan COVID-19 berat dan kritis di RSUP Dr. Sardjito.

**METODE:** Ini adalah studi kohort retrospektif yang melibatkan pasien COVID-19 berat dan kritis dewasa yang dirawat di rumah sakit di RSUP Dr. Sardjito dari April 2021 hingga Oktober 2021. Variabel independen adalah tingkat AaDO<sub>2</sub> dan laktat sedangkan variabel dependen adalah mortalitas pasien COVID-19. Data diperoleh dari rekam medis. Titik potong dari variabel independen ditentukan dengan menggunakan kurva ROC. Hubungan antara variabel independen dan dependen diuji dengan analisis bivariat Pearson dan analisis multivariat menggunakan regresi logistik.

**HASIL:** Data dari 270 pasien dianalisis. Analisis bivariat Pearson antara AaDO<sub>2</sub> dan laktat terhadap mortalitas menunjukkan risiko relatif sebesar 2,418 (95%CI 1,483 – 3,940;  $p < 0,001$ ) dan 0,717 (95%CI 0,387 – 1,331;  $p$ -value tidak signifikan). Regresi logistik berganda yang melibatkan variabel independen dan variabel pengganggu menunjukkan asosiasi yang signifikan secara statistik antara AaDO<sub>2</sub>, syok, dan epinefrin terhadap mortalitas, dengan risiko relatif yang disesuaikan  $Exp(B)$  masing-masing sebesar 2,849, 26,702, dan 9,803.

**SIMPULAN:** Terdapat asosiasi antara AaDO<sub>2</sub> dengan mortalitas pasien COVID-19 sedangkan tidak ditemukan asosiasi antara laktat dengan mortalitas.

**KATA KUNCI:** COVID-19, AaDO<sub>2</sub> tinggi, tingkat laktat tinggi, mortalitas, studi kohort retrospektif.