

## KORELASI GAMBARAN RADIOGRAFI TORAKS PNEUMONIA COVID-19 DENGAN *BRIXIA SCORE* TERHADAP LEVEL PLASMA C- *REACTIVE PROTEIN*

Juliarti<sup>1</sup>, Bagaswoto Poedjomartono<sup>2</sup>, Anita Ekowati<sup>2</sup>

<sup>1</sup>Residen dan <sup>2</sup>Staf Departemen Radiologi, Fakultas Kedokteran, Kesehatan Masyarakat dan Keperawatan Universitas Gadjah Mada, Yogyakarta

### INTISARI

**Latar belakang:** Angka kejadian COVID-19 di Indonesia terus meningkat. Tes diagnostik khusus untuk mendeteksi COVID-19 tidak selalu tersedia dan membutuhkan waktu untuk mendapatkan hasil. CXR bermanfaat untuk triage awal pasien dengan suspek COVID-19. Diperlukan satu biomarker yang dapat diandalkan dan terpercaya untuk memprediksi tingkat keparahan pneumonia COVID-19. Penanda inflamasi CRP, LED, dan feritin meningkat pada pasien dengan penyakit parah atau lebih buruk.

**Tujuan penelitian:** Mengetahui apakah terdapat hubungan korelasi antara gambaran radiografi toraks pneumonia COVID-19 dengan *Brixia Score* terhadap penanda laboratorium rutin yaitu level plasma *C-reactive protein* (CRP).

**Bahan dan Cara:** Penelitian ini adalah penelitian observasional analitik korelasi *cross-sectional* dengan data sekunder secara *consecutive non-random sampling*. Subjek penelitian adalah semua pasien COVID-19 dengan hasil PCR positif dengan gambaran pneumonia typical yang dilakukan pemeriksaan darah CRP dengan rentang waktu dengan pemeriksaan foto toraks kurang dari 24 jam di RSUP Dr Sardjito dengan periode Juni 2020-Juli 2021. Dilakukan penilaian foto toraks dengan sistem *Brixia Score* dengan nilai 0-18. Hasil CRP dikorelasikan dengan *Brixia Score* menggunakan uji korelasi.

**Hasil:** Didapatkan 40 subjek penelitian yang memenuhi kriteria inklusi dan eksklusi penelitian. Jenis kelamin laki-laki 20 subjek (50%) dan perempuan 20 subjek (50%). Dengan sebaran usia 18-30 tahun sebanyak 5 subjek (12,5%), 31-45 tahun sebanyak 10 subjek (25%), 46-59 tahun sebanyak 14 subjek (35%) dan  $\geq 60$  tahun sebanyak 11 subjek (27,5%). Untuk hasil luaran didapatkan 35 subjek sembuh (87,5%), meninggal 4 subjek (10%) dan pulang paksa sebanyak 1 subjek (2,5%). Untuk nilai mean *Brixia score* didapatkan  $8,23 \pm 3,06$ , dan nilai mean CRP  $102,65 \pm 43,16$ . Tidak terdapat korelasi antara *Brixia Score* dengan CRP. Dari hasil analisis kurva ROC didapatkan *Brixia score* memiliki kemampuan yang lebih baik daripada CRP dalam memprediksi kematian.

**Kesimpulan:** Tidak terdapat korelasi yang bermakna secara statistik antara *Brixia Score* dengan CRP ( $p=0,817$ ) dengan nilai koefisien korelasi ( $r$ ) sebesar 0,039. Hasil analisis kurva ROC didapatkan hasil bahwa *Brixia score* memiliki kemampuan diskriminasi yang lebih baik daripada CRP dalam memprediksi kematian.

Kata kunci: Pneumonia COVID-19, Brixia Score, radiografi toraks, CRP

## CORRELATION OF RADIOGRAPHIC IMAGES OF THORAX PNEUMONIA COVID-19 WITH BRIXIA SCORE AND PLASMA LEVEL C-REACTIVE PROTEIN (CRP)

Juliarti<sup>1</sup>, Bagaswoto Poedjomartono<sup>2</sup>, Anita Ekowati<sup>2</sup>

<sup>1</sup>Resident and <sup>2</sup>Staff of the Department of Radiology, Faculty of Medicine, Public Health and Nursing, Gadjah Mada University, Yogyakarta

### ABSTRACT

**Background:** COVID-19 in Indonesia continue to increase. Specific diagnostic tests to detect COVID-19 are not always available and take time to get results. CXR is useful for the initial triage of patients with suspected COVID-19. A reliable biomarker is needed to predict the severity of COVID-19 pneumonia. Inflammatory markers such as CRP, ESR, and ferritin are elevated in patients with severe or worse disease.

**Objectives:** To determine correlation between the chest radiography of COVID-19 pneumonia based on the Brixia Score and a routine laboratory marker namely plasma level C-Reactive Protein (CRP).

**Materials and Methods:** This study was a cross-sectional correlation analytic observational study with secondary data using consecutive non-random sampling. The research subjects were all COVID-19 patients with positive PCR results with a typical pneumonia picture who underwent blood examinations of CRP with a time span with a chest X-ray examination of less than 24 hours at Dr Sardjito Hospital for the period June 2020-July 2021. A chest X-ray was assessed using the system Brixia Score with a value of 0-18. The CRP were correlated with the Brixia Score with a correlation test.

**Results:** There were 40 research subjects who met the inclusion and exclusion criteria of the study. Male 20 subjects (50%) and female 20 subjects (50%). With the distribution of age 18-30 years as many as 5 subjects (12.5%), 31-45 years as many as 10 subjects (25%), 46-59 years as many as 14 subjects (35%) dan  $\geq 60$  years as many as 11 subjects (27.5%). For the outcome, 35 subjects recovered (87.5%), 4 subjects died (10%), and 1 subject forced home. The mean Brixia score is  $8.23 \pm 3.06$  and the mean CRP is  $102,65 \pm 43,16$ . There is no correlation between Brixia Score and CRP. From the results of the ROC curve analysis, it was found that the Brixia score had a better ability than the CRP in predicting death.

**Conclusion:** There is no correlation between Brixia Score with the CRP ( $p=0.817$ ) with a correlation coefficient ( $r$ ) of 0.039. From the results of the ROC curve analysis, it was found that the Brixia score had a better ability than the CRP in predicting death.

**Keywords:** Pneumonia COVID-19, Brixia Score, chest radiograph, CRP