

The relationship between serum biomarkers and viral load of COVID-19 with severity of lung involvement on chest computed tomography - a single centre study

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ABSTRACT

Introduction: The objective of this study is to investigate the relationship between Cycle Threshold (Ct) values and serum biomarkers in COVID-19 patients with Total Severity Score (TSS) on chest computed tomography (CT). Apart from this, this study also aims to explore the role of TSS, serum biomarkers and viral load in predicting the disease severity and clinical outcome of patients with COVID-19. **Methods:** In this retrospective cross-sectional study, we included 213 confirmed COVID-19 patients from Hospital Sungai Buloh who conform to the inclusion criteria. A search was performed on the picture archiving and communication system (PACS) and Centricity UV to collect data on the clinical features, laboratory findings (the first one upon admission), epidemiological characteristics as well as the chest CT scans of the targeted group. To quantify the extent of COVID-19 lung involvement in CT scan, TSS was applied. Data was collected and analysed using SPSS. **Results:** There were significant correlations between TSS of chest CT with four out of the six serum biomarkers studied, namely C-Reactive Protein (CRP), Neutrophil-Lymphocyte Ratio (NLR), creatinine and Lactate Dehydrogenase (LDH). There was an inverse relationship between TSS and Ct values. TSS, serum biomarkers (NLR, CRP, LDH and creatinine) as well as Ct value are good predictors of disease severity. **Conclusion:** TSS is a reliable scoring method to determine the severity of COVID-19 patients. Serum biomarkers which include NLR, CRP, LDH and creatinine are good predictors of disease severity and can be used for stratification of patients according to severity. Ct value is a valuable early indicator of disease severity.