Role of cell activation parameters in predicting severity of COVID-19 patients in Kelantan

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ABSTRACT

Introduction: Timely recognition and prompt intervention of critically severe COVID-19 patient is important in the reduction of COVID-19 infection mortality rates. This study aimed to identify extensive haematological parameters (Hemoglobin, Neutrophils, NLR, IG, RET, etc) including cell activation parameters (AS-LYMP, RE-LYMPH, NEUT-RI, NEUT-GI) in predicting the severity of COVID-19 infection hence to expand its use as predictive biomarkers. **Methods:** This study was a prospective cohort study involving 118 COVID-19 patients admitted to Hospital Universiti Sains Malaysia and Hospital Raja Perempuan Zainab 2, from November 2022 till December 2023. For this study, blood samples from COVID-19 patients were collected in an EDTA vacutainer tube. Receiver operating characteristics were used to estimate the performance of the evaluated parameters in predicting the ICU admission. Logistic regression test was used to determine the association between cell activation parameters and patients' survival. **Results:** NEUT-RI and NLR emerge as the most promising predictor for ICU admission (AUC:0.719 and AUC:0.760 respectively), both with $p<0.05$. NEUT-RI displayed borderline significance for patients' survival in the univariable model ($p=0.050$) but was not significant in the multivariable model. Both NLR and IG emerged as significant predictors of the survival, maintaining their significance in univariable models ($p<0.001$ and $p=0.048$ respectively). Other cell activation parameters did not reveal significant associations in either model. **Conclusions:** NLR is the best marker for predicting ICU admission for COVID-19 patients, followed by NEUT-RI, Neutrophils and IG. NEUT-RI, NLR and IG are shown to be the most significant markers that helps in predicting patient's survival among COVID-19 patients.