Prediction Capability of Laboratory Indices and Charlson Index in Early Hospitalized COVID-19 Patients: A Study at Imam Khomeini Hospital, Ardabil

Abstract:

Background: With the global pandemic of COVID-19, healthcare systems and consequently people worldwide faced numerous challenges. Among these, the investigation of factors associated with clinical outcomes in patients, given the emerging circumstances, has been of significant importance.

Aim: This study aimed to assess and determine the predictive capability of laboratory indices and the Charlson Index for mortality in early hospitalized COVID-19 patients at Imam Khomeini Hospital in Ardabil.

*Material and Methods***:** In this cross-sectional study conducted from the beginning of Farvardin to the end of Shahrivar in 1399, all COVID-19 patients hospitalized at Imam Khomeini Hospital in Ardabil were examined. The inclusion criteria encompassed patients with a positive real-time PCR test or those diagnosed based on CT scan findings and national COVID-19 guidelines. Demographic, clinical, and laboratory data were collected and modified laboratory indices and the Charlson Index were used to estimate mortality prediction. Statistical analysis was performed using SPSS V21, and P<0.05 was considered significant.

*Results :*Out of the patients, 23/75% had a history of cardiovascular disease, 14/5% had a history of heart attack, 2.6% had a history of heart failure, 26/25% had diabetes, 26/25% had a history of high blood pressure, 8.2% had a history of respiratory disease, 3.2% had a history of stroke, 2.9% had a history of cancer, 9.7% had kidney disease, 2.6% had a history of rheumatology, and 0.8% had a history of other illnesses. Among COVID-19 patients, 83.2% survived, and 16.8% passed away. Analysis showed a significant correlation between laboratory and clinical results (P=0.01). The Charlson Index performed much better than laboratory indices in predicting mortality (with a significant ROC value). Furthermore, both the

Charlson Index and laboratory indices were significantly associated with survival (P<0.001). Regression analysis also demonstrated that both indices are strongly associated with survival.

***Conclusion*:** In this study, the Charlson Index outperformed laboratory indices in diagnosing and predicting mortality in COVID-19 patients. Moreover, both the Charlson Index and laboratory indices were significantly associated with survival, highlighting their potential to enhance clinical decision-making and patient management in COVID-19 cases.