Assessment of Biochemical Marker Profiles and Their Impact on Morbidity and Mortality of COVID-19 Patients in Tigray, Ethiopia

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Abstract : Abstract: The emergence and subsequent rapid worldwide spread of the COVID-19 pandemic have posed a global crisis, with a tremendously increasing burden of infection, morbidity, and mortality risks. Recent studies have suggested that severe cases of COVID-19 are characterized by massive biochemical, hematological, and inflammatory alterations whose synergistic effect is estimated to progress to multiple organ damage and failure. In this regard, biochemical monitoring of COVID-19 patients, based on comprehensive laboratory assessments and findings, is expected to play a crucial role in effective clinical management and improving the survival rates of patients. However, biochemical markers that can be informative of COVID-19 patient risk stratification and predictor of clinical outcomes are currently scarcely available. The study aims to investigate the profiles of common biochemical markers and their influence on the severity of the COVID-19 infection in Tigray, Ethiopia. Methods: A laboratory-based cross-sectional study was conducted from July to August 2020 at Quiha College of Engineering, Mekelle University COVID-19 isolation and treatment center. Sociodemographic and clinical data were collected using a structured questionnaire. Whole blood was collected from each study participant, and serum samples were separated after being delivered to the laboratory. Hematological biomarkers were analyzed using FACS count, while organ tests and serum electrolytes were analyzed using ion-selective electrode methods using a Cobas-6000 series machine. Data was analyzed using SPSS Vs 20. Results: A total of 120 SARS-CoV-2 patients were enrolled during the study. The participants ranged between 18 and 91 years, with a mean age of 52 ($\pm$108.8). The majority (40%) of participants were between the ages of 60 and above. Patients with multiple comorbidities developed severe COVID-19, though not statistically significant (p=0.34). Mann-Whitney U test analysis showed that biochemical tests such as neuropile count (p=0.003), AST levels (p=0.050), serum creatinine (p=0.000), and serum sodium (p=0.015) were significantly correlated with severe COVID-19 disease as compared to non-severe disease. Conclusion: The severity of COVID-19 was associated with higher age, organ tests AST and creatinine, serum Na+, and elevated total neutrophile count. Thus, further study needs to be conducted to evaluate the alterations of biochemical biomarkers and their impact on COVID-19.

Keywords : COVID-19, biomarkers, mortality, Tigray, Ethiopia

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