Alanine aminotransferase serum levels in COVID-19 patients inversely correlate with SARS-CoV-2 antigen

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The interesting work by Goel *et al.* [1] supported that alanine aminotransferase (ALT) is negatively associated with mortality in coronavirus disease 2019 (COVID-19) patients. Reinforcing this finding, we confirm an association between ALT levels and severe acute respiratory syndrome coronavirus 2 antigen (SARS-CoV-2 Ag) kinetics that could reveal a mechanism underlying clinical disease course.

In an interim analysis of an ongoing prospective study, we have established a relationship between SARS-CoV-2 Ag and ALT serum levels in immunocompetent patients hospitalized at the COVID-19 Department of the University Hospital of Larissa, Greece. Our study currently involved a cohort of 20 Greek RT-PCR confirmed COVID-19 patients (15 male and 5 female). Nasopharyngeal swabs and whole blood specimens were obtained every 2 days until hospital discharge or death. We quantitatively determined for every patient the SARS-CoV-2 nucleocapsid protein and the IgA, IgM, IgG spike protein-specific antibodies, respectively, using lateral flow immunochromatographic assays (Catalog numbers: V1310/30 and V1210/V1230, Prognosis Biotech, Larissa, Greece). ALT levels were recorded on the same dates. Pooled values of serial measurements of ALT and SARS-CoV-2 Ag from each patient were correlated.

The mean age of participants was 65.60 ± 17.84 years. The mean duration of hospitalization was 14 ± 3 days. ALT values (U/L) on admission and at peak ranged from 11.0 to 1102 and 17.7 to 1230.10, respectively. Mean values of ALT (75.34 ± 177.15 U/L) and mean values of SARS-CoV-2 Ag were (81.91 ± 248.46 AU). SARS-CoV-2 Ag was negatively correlated with ALT ($\rho = -0.355$, $P = 0.001$) and Ig ($\rho = -0.536$, $P < 0.001$).

These data strongly support the view of Goel *et al.* that the inability to raise ALT as COVID-19 progressed portended a worse outcome in infected patients. Higher SARS-CoV-2 Ag detection implies higher viral load which leads to a worse prognosis [2]. We suggest that the underlying pathophysiological mechanism of liver-associated mortality in COVID-19 patients should further be studied in the context of ALT and hepatocyte immune function [3,4].

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Conflicts of interest

There are no conflicts of interest.

References

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