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Impact of total serum bilirubin on all-cause mortality and AKI requiring dialysis in patients with COVID-19 in Korea

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Objectives: Previous studies suggested that liver dysfunction could serve as prognostic tools in assessing the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infections. We focused on total serum bilirubin, which has recently been attracting attention for its association with a high risk of mortality. However there have been no published large-scale studies conducted for Koreans with similar topics, so we assessed the impact of bilirubin on all-cause mortality and acute kidney injury requiring dialysis (AKI-D) in coronavirus disease 2019 (COVID-19) patients in Korea.

Methods: This research was conducted using the data from two different institutions in Korea that treated COVID-19 patients from February, 2020, to September, 2021. Data from 4365 adults out of 4,423 COVID-19 patients without missing values, end stage renal disease (ESRD), a history of kidney transplant, and recent use of immunosuppressive drugs were analyzed. We used bilirubin levels measured on the day of hospitalization for SARS-CoV-2 infection. The main outcomes of interest were two things: all-cause mortality and AKI-D. Statistical analyses were performed with cox-proportional hazard models.

Results: Analysis of data for 4,365 adults (mean age 54.5±18.3 years, 54.3% female) who met inclusion/exclusion criteria suggests that high total bilirubin is associated with high mortality (adjusted hazard ratio, 1.647; 95% confidence interval [CI], 1.219 to 2.226; P<0.001). Death occurred in 12 of 119 patients (10.1%) in the high-bilirubin group and in 121 of 4246 patients (2.8%) in normal group (P<0.001). However there were no significant between-group differences with respect to the outcome of AKI-D (adjusted hazard ratio, 1.930; 95% CI, 0.724 to 5.144; P=0.189).

Conclusions: Increased bilirubin is relevant to higher mortality in Korean patients with COVID-19. Therefore total bilirubin should be assessed early as a screening tool for risk stratification in Korean COVID-19 patients. However it seems difficult to use bilirubin as a predictor of AKI-D.

Table 2. Significance of total bilirubin on all-cause mortality