

Association between Biomarkers of Inflammation and Delirium in Critically Ill Patients with COVID-19.

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Background: Critical illness with COVID-19 is associated with increased delirium duration and severity, and delirium is associated with poor health outcomes. The pathophysiology of delirium in this population is not well understood but neuroinflammation is hypothesized to play a key role.

Objective: To evaluate the relationship between biomarkers of systemic inflammation and delirium in critically ill patients with COVID-19.

Design: Observational retrospective data extraction study from March 1, 2020 – June 7, 2020. Biomarker levels and delirium occurrence were assessed up to the first 14 days in the intensive care unit (ICU).

Setting: Two large, urban, academic referral hospitals in Indianapolis, IN

Patients: Two hundred thirty-five patients admitted to the ICU with a positive SARS-Co-V2 PCR test

Methods and Main Results: A total of 235 consecutive patients admitted to the ICU were included in the analysis. The cohort had a mean age of 58.6 years (SD: 15.4), 43.4% were female, 45.9% were African American, with median Acute Physiology and Chronic Evaluation-II score of 18.0 (IQR: 13.0 -15.0). Delirium occurred in 176 (79.1%). Increased levels of C-Reactive Protein (CRP) were associated with increased odds of delirium and coma (OR: 1.27, 95% CI: 1.08, 1.49, p=0.004). Increased levels of D-dimer were not associated with increased odds of delirium/coma (OR: 0.94, 95% CI 0.76, 1.16, p=0.574). Increased levels of ferritin (OR: 1.04, 95% CI 0.84, 1.29, p=0.717) and lactate dehydrogenase (LDH) were also not associated with increased odds of delirium/coma (OR: 0.86, 95% CI 0.70, 1.06, p=0.149). Elevated levels of creatine kinase (CK) levels were associated with lower odds of delirium/coma (OR: 0.71 95% CI 0.52, 0.97, p=0.033).

Conclusion: Increased levels of biomarkers of inflammation and thrombosis were associated with greater odds of delirium and coma. Further studies are needed to validate these results in a larger population.

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