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EPICC Study Group

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Background. Approximately 10-20% of patients with critical COVID-19 harbor neutralizing autoantibodies (auto-Abs) that target type I interferons (IFN), a family of cytokines that induce critical innate immune defense mechanisms upon viral infection. Studies to date indicate that these auto-Abs are mostly detected in men over age 65.

Methods. We screened for type I IFN serum auto-Abs in sera collected < 21 days post-symptom onset in a subset of 103 COVID-19 inpatients and 24 outpatients drawn from a large prospective cohort study of SARS-CoV-2 infected patients enrolled across U.S. Military Treatment Facilities. The mean age of this n = 127 subset of study participants was 55.2 years (SD = 15.2 years, range 7.7 – 86.2 years), and 86/127 (67.7%) were male.

Results. Among those hospitalized 49/103 (47.6%) had severe COVID-19 (required at least high flow oxygen), and nine subjects died. We detected neutralizing auto-Abs against IFN-α, IFN-ω, or both, in four inpatients (3.9%, 8.2% of severe cases), with no auto-Abs detected in outpatients. Three of these patients were white males over the age of 62, all with multiple comorbidities; two of whom died and the third requiring high flow oxygen therapy. The fourth patient was a 36-year-old Hispanic female with a history of obesity who required mechanical ventilation during her admission for COVID-19.

Conclusion. These findings support the association between type I IFN auto-antibody production and life-threatening COVID-19. With further validation, reliable high-throughput screening for type I IFN auto-Abs may inform diagnosis, pathogenesis and treatment strategies for COVID-19, particularly in older males. Our finding of type I IFN auto-Ab production in a younger female prompts further study of this autoimmune phenotype in a broader population.

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451. Is Antibody to Nucleocapsid More Prevalent in Individuals with Severe COVID-19?

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Background. Virus-specific antibodies help to understand the prevalence of infections and the course of the immune response. Humans produce antibodies against the spike and nucleocapsid proteins of SARS-COV-2 virus. Patients with COVID-19 who recover from the infections have higher levels of antibodies to spike proteins. Our study aimed to find the levels of antibodies to spike and nucleocapsid proteins in severe COVID-19.

Methods. A single center prospective study was done at Ascension St John Hospital, Detroit, MI. We included COVID-19 cases diagnosed by reverse-transcriptase polymerase-chain-reaction (RT-PCR). Quantitative measurements of plasma or serum antibodies to nucleocapsid and spike proteins were done in hospitalized patients with acute COVID-19. Using the electronic medical record, we collected data on demographic and clinical information.

Results. A total 24 patients were studied. Of which, 15 patients were suffering from severe and critical COVID 19 and 9 patients were suffering from mild to moderate COVID 19. The mean age (standard deviation) of our cohort was 69 ± 10 years and 60% were males. Common comorbid conditions were hypertension, obesity, and type 2 diabetes. We also noted that severe to critical COVID 19 expressed higher level of antibody to nucleocapsid.

Conclusion. These results display the seroconversion in COVID 19 patients. Our study shows antibody level remain high in severe COVID 19 patients but those are against nucleocapsid protein instead of spike protein.

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452. Correlation of Charleston Comorbidity Index Score as the COVID-19 Pandemic Surged Throughout HCA Healthcare Facilities and Patient Outcomes

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Session: P-21. COVID-19 Research

Background. As the COVID-19 pandemic raged throughout the United States, the healthcare system was strained due to a sudden increase in demand. Testing was initially limited, and the perception was that patients with high comorbidity burden were at higher risk for poor outcomes. The Charleston Comorbidity Index (CCI) is widely used as a predictor of prognosis and one-year mortality for a wide range of pathologies. This study aims to assess whether a correlation exists between CCI score, COVID-19 incidence throughout the pandemic and patient outcomes.

Charleston Comorbidity Index Score

Charleston Comorbidity Index (CCI)	
Condition	**Score**
Myocardial infarction	1
Congestive Heart Failure	1
Peripheral Vascular Disease (including aortic aneurysm >6cm)	1
TIA or Cerebrovascular disease with mild of no residua	1
Dementia	1
Chronic pulmonary disease	1
Connective tissue disease	1
Peptic ulcer disease	1
Mild liver disease without portal HTN	1
Diabetes without end-organ damage	1
Hemiplegia	2
Moderate or severe renal disease	2
Diabetes with end-organ damage	2
Tumor without metastases (diagnosed <5years ago)	2
Leukemia	2
Lymphoma	2
Moderate or severe liver disease	3
Metastatic solid tumor	6
AIDS	6

Scoring system for Charleston Comorbidity Index (CCI). Plus 1 point for every decade age 50 years and over, maximum 4 points. Higher scores indicate a more severe condition and consequently, a worse prognosis.

Methods. Multicenter, retrospective review of patients diagnosed with COVID-19 from January 2020 to September 2020 throughout the HCA Healthcare system. The percent of total encounters that were COVID-19 positive by state was calculated along