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Spotlight on Special Topics

OBESITY, INFLAMMATION, AND OUTCOMES IN COVID-19

Moderated Poster Contributions
Saturday, May 15, 2021, 11:45 a.m.-11:55 a.m.

Session Title: Markers to Measure Mortality: Biomarkers, Inflammatory Markers and Other Markers of Outcomes in Patients with COVID-19 Infection
Abstract Category: 61. Spotlight on Special Topics: Coronavirus Disease (COVID-19)
Presentation Number: 1088-17

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Background: Obesity is a risk factor for severe coronavirus disease 2019 (COVID-19), but the mechanism remains unclear. We hypothesized that obesity, itself an inflammatory condition, increases risk of severe COVID-19 via augmentation of the acute inflammatory response seen in severe COVID-19.

Methods: We performed a multicenter observational study leveraging the Michigan Medicine COVID-19 Cohort (M_2C_2) to analyze the relationship between obesity defined by body mass index (BMI) ≥30 kg/m^2, inflammatory biomarkers, and clinical outcomes in patients hospitalized for COVID-19. The study population included 733 patients admitted between March 1st and May 31st, 2020.

Results: On admission, obese patients had higher levels of C-reactive protein (CRP, p=0.011), lactate dehydrogenase (LDH, p<0.001), and soluble urokinase-type plasminogen activator receptor (suPAR, p=0.005) than overweight (25.0-29.9 kg/m^2) and normal BMI (18.5-24.9 kg/m^2) patients. There were positive correlations between BMI and CRP (0.124; p=0.001), LDH (0.209; p<0.001), and suPAR (0.133; p=0.001) which remained significant even after controlling for age, sex, race, smoking, diabetes, hypertension, and renal function. There were no significant differences in or correlations with levels of ferritin, D-dimer, or interleukin 6. Controlling for the same covariates, obese patients had a 2.4-fold increase in intensive care unit admission (p=0.001), 2.3-fold increase in mechanical ventilation (p=0.003), and 2.3-fold increase in vasopressor use (p=0.006) compared to normal BMI patients. Obese patients did not have a significant increase in in-hospital mortality or dialysis, but every 5 kg/m^2 increase in BMI corresponded with a 1.2-fold increase in both in-hospital mortality (p=0.028) and dialysis (p=0.035). Addition of inflammatory markers to the regression model attenuated the association of BMI with mortality and dialysis but not mechanical ventilation.

Conclusion: The association between obesity and poor clinical outcomes in patients with COVID-19 is only partially accounted for by inflammation. Further study is warranted to elucidate the pathophysiologic link between obesity and severe COVID-19.