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The Effects of Different Antihypertensives, Steroids, and Beta Blockers on COVID-19 Outcomes in a CKD and Non-CKD Cohort in Detroit, Michigan

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The effects of different antihypertensive medications, steroids, and beta blockers on COVID-19 outcomes in a CKD and non-CKD cohort in Detroit, Michigan

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Initial studies during the COVID-19 pandemic reported angiotensin converting enzyme 2 inhibitors (ACE2i) could be associated with worse disease course due to potential increase in (angiotensin converting enzyme 2) ACE2 receptors which SARS-CoV2 virus uses for cellular entry. Subsequent studies refuted such concerns, reporting that continued use of ACEis and angiotensin receptor blockers (ARBs) in hypertensive individuals is protective. Moreover, certain comorbidities, such as hypertension and heart disease, have been linked to a higher risk of disease severity. However, there remains a paucity of data evaluating effects of various antihypertensive medications, steroids, and beta blockers in chronic kidney disease (CKD) populations and in individuals with normal kidney function. This study was designed to evaluate the potential risk associated with renin angiotensin system inhibitors, calcium channel blocker, mineralocorticoid receptor blocker, steroids and beta blockers in a cohort of mostly Black and Caucasian patients admitted to Detroit Medical Center for COVID-19. We conducted a retrospective study on patients admitted to Detroit Medical Center, Detroit, MI during March and April of 2020. The data were collected through the electronic medical chart reviews. We assessed 330 patients using inclusion criteria of age > 18 years and a positive SARS-CoV2 PCR test. We used the mean, standard deviation/standard error of mean, and percentages when appropriate for the description of patient characteristics. Group differences (CKD vs. non-CKD) were compared using the Pearson $\chi2$ test. P-values of <0.05 were regarded as significant. We conducted binary logistic regression analysis to determine the effect of biological sex and CKD status on in-hospital mortality due to COVID-19. We conducted multivariate regression analysis for factors contributing to mortality during COVID-19 hospitalization and ICU admission, evaluating the contribution of different medications, comorbidities, and clinical course of the disease. On regression analyses, the odds of death during hospitalization for COVID-19 infection was not significantly associated with either biological sex, race, or CKD status in our sample population. The odds of dying in the hospital were higher in patients who were on calcium channel blockers (OR 2.99, 95% CI 1.29-6.93, P = 0.01) and steroids (OR 4.23, 95% CI 1.17-15.31, P = 0.03). The only significance for ICU admission was obtained for steroid use (OR 1.872, 95% CI 1.059-3.311, P = 0.03). Likewise, COPD was the only comorbidity found to be associated with ICU admission (OR 2.38, 95% CI 1.282 - 4.426, P = 0.006). Significant associations were not observed for patients taking ACEis, ARBs, mineralocorticoid receptor inhibitors, diuretics, beta blockers and sympatholytics.