The Use of Low Dose Tocilizumab SARS-CoV-2 In a Minority Population in New Jersey

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BACKGROUND

- SARS-CoV-2 has caused a worldwide pandemic; as of March 2022, it has affected over 78.8 million individuals with over 958,609 deaths in the United States. [1]
- The coronaviruses infect monocytes, dendritic cells, and T cells which activate and secrete IL-6.
- High circulating concentrations of IL-6 bind to the soluble form of IL-6R complex that activates endothelial cells and sets off a "cytokine storm," known as the cytokine release syndrome (CRS). Severe cases of cytokine release can cause multi-organ failure with life-threatening complications. [2]
- Tocilizumab is a monoclonal antibody that inactivates the IL-6 receptor thus altering the cytokine storm.
- We aim to examine the use of the IL-6 inhibitor, tocilizumab, at a dose of 200 mg or less in a single, community-based institution.

METHODS

- We performed a retrospective analysis on 55 patients with confirmed COVID-19 virus between March-July 2020. who were above 18 years of age and had respiratory symptoms, which required the use of supplemental oxygen for saturation of less than 94% on ambient air.
- This study was reviewed by the Trinitas Medical Center IRB and consent was obtained from patients or their health care proxy to receive medication for off-label use of this infusion.
- Tocilizumab was given to patients that had hypoxemia, lung infiltrates on chest radiography, and elevated biomarkers. We assessed all patients for inflammatory markers such as CRP, fibrinogen, d-dimer, and ferritin. We analyzed IL-6 levels in all patients.
- Following the administration of medication, inflammatory markers were repeated within 48 hours to check for measurable change. Four patients had received a second dose of 162 to 200 mgs after 48 hours due to lack of clinical improvement or no change in CRP.
- Descriptive analysis was performed on all patients receiving tocilizumab using SigmaPlot/SyStat Software

RESULTS

- In total, 73% (40) were Hispanic, 18% (10) African American, and the remaining 9% (5) were Caucasian. Co-morbidities include 28.5% with cardiopulmonary disease, 23% with diabetes, and 50% with no underlying comorbidities.
- Mortality: 19 fatalities (34%) of the 55 patients were documented. Of these 14 were Hispanic, 3 were African American and 2 were Caucasian. Figure 1 notes demographics based on age and mortality.
- 20 patients had undergone endotracheal intubation and 35 had received NINV as their highest level of respiratory support during hospitalization. Of the 54 patients who had received low dose tocilizumab, 61.11% (33) had improved respiratory status and 38.8% (21) had worsened or died.
- Inflammatory markers, such as CRP and ferritin, were collected in all.

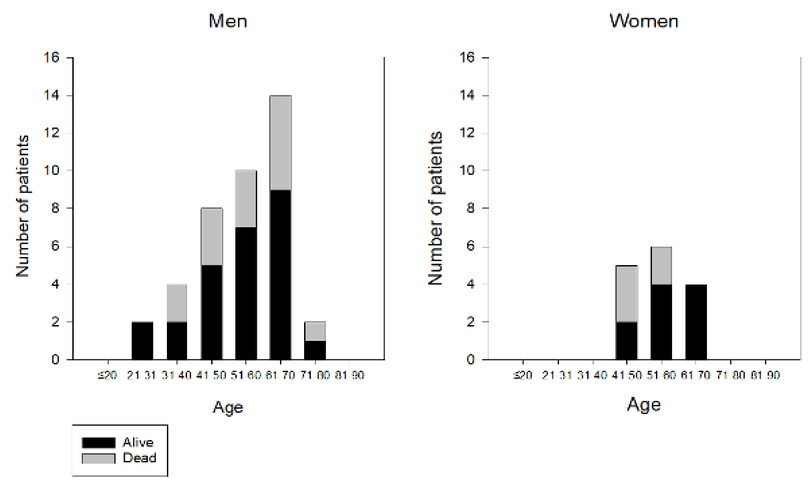
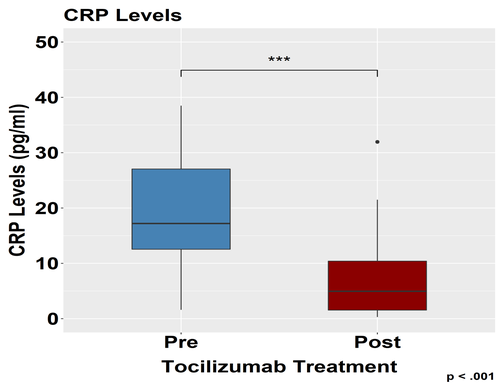
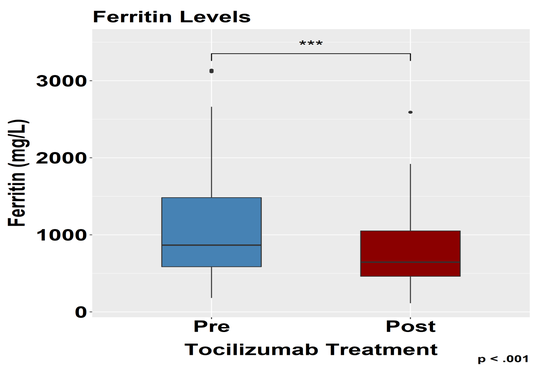


Figure 1: Showing deaths and survival observed for COVID-19 patients according to demographics.





Conclusion

- These results suggest that low dose tocilizumab could cause an improvement in the respiratory status of our minority population with SARS-CoV-19.
- CRP and ferritin performed prior to and post will be helpful markers regarding treatment response.
- This treatment may have allowed many to be safely weaned off ventilatory support
- A large majority of our patients are Hispanic, followed by African Americans. Currently, non-Hispanic black persons are hospitalized at a rate that is 5 times that of non-Hispanic white persons. Hispanic persons have an admission rate that is 4 times that of non-Hispanic white persons[3,4]. Health differences between ethnic groups can be due to inequities in social, living, and health conditions
- We suggest that more studies include a more diverse ethnic population of individuals
- The limitations is that this was a single-center study and there was neither a control or placebo group. A larger multicenter with low dose treatment is suggested

References

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