effective in treating CRS secondary to CAR-T cell therapy. The efficacy of tocilizumab in treating Covid-19 is unknown.

Methods: This was a retrospective cohort study conducted at two hospitals in northern New Jersey. All patients treated with tocilizumab for confirmed or suspected Covid-19 between the dates of 3/10/20 and 4/9/20 at the study sites were included. The primary endpoint was clinical improvement on day 7 after treatment as assessed by respiratory status. Univariate analysis compared data between those who improved and those who did not.

Results: Forty five severe and critically ill patients treated with tocilizumab for Covid-19 were evaluated. Eleven (24%), 22 (49%) and 12 (27%) patients improved, had no change and worsened by day 7 after treatment, respectively. Lower WBC and LDH at the time of drug administration as well as shorter time from supplemental oxygen initiation to dose were significantly associated with clinical improvement in the univariate analysis.

Conclusion: Tocilizumab administration was associated with a low rate of clinical improvement within 7 days in this cohort of severe and critically ill patients with Covid-19.

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555. Effectiveness of a Treatment Team on Adherence to Health System Guidelines for Hydroxychloroquine Use During Two Phases of the COVID-19 Epidemic

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Background: Our hospital system created system guidelines to standardize care across 24 hospitals for COVID-19 treatment during the pandemic. Guidelines changed over time. Hydroxychloroquine (HCQ) was unrestricted during phase 1, then restricted by pharmacy outside of a randomized clinical trial (RCT) during phase 2 (excepting those ineligible for RCTs).

Methods: This was a prospective study to assess system-wide adherence to COVID-19 treatment guidelines, and to evaluate patient outcomes.

Results: Of 261 patients, median age was 67 years (IQR 56–76); 49% (129/261) were male, and 45% (118/261) required ICU care.

Overall, 47% (122/261) were in phase 1; HCQ was offered to 57% (69/122) during this phase. The rate of HCQ prescription in phase 2 decreased significantly to 10% (14/136), ($p < 0.001$). Adherence to COVID-19 treatment protocol was 97% (135/139) during phase 2. Mortality was similar in both phases (22% vs 28%, p=0.32), as was median length of stay (8 vs 7 days, p=0.3). Overall 66 patients (25%) died in the hospital; neither non-adherence (p=1) to system guidelines nor receipt of HCQ (p=0.17) were risk factors for death.

Independent predictors of mortality included: new renal replacement therapy (OR 61, 95%CI 6.7–560, $p < 0.001$), mechanical ventilation (OR 4.9, 95%CI 2.0–11, $p < 0.001$), abnormal chest X-ray (OR 4.3, 95%CI 1.4–12.6, p =0.009), history of heart failure (OR 3.9, 95%CI 1.5–11, p=0.006), lack of fever on admission (OR 3.5, 95%CI 1.7 -7.6, p =0.001), receipt of corticosteroids (OR 2.7 95%CI 1.1–6.6, p=0.026) and increased age (OR 1.07 per year, 95%CI 1.04–1.1, $p < 0.001$). Bacterial pneumonia occurred in 8% (21/261), more commonly in those who died (p=0.02). Black patients had a higher race-specific death rate (308 vs 197) per 1000 than white patients ($p< 0.001$).

Conclusion: During the COVID-19 pandemic, our health system guidelines and pharmacy restrictions were successful in delivering consistent care across hospitals. Restriction of HCQ for COVID-19 treatment to RCTs reduced its use in phase two. Non-adherence to systemic guidelines was infrequent, and not associated with adverse outcomes. A COVID-19 treatment team of physicians and pharmacists can effectively coordinate therapy across hospitals in the setting of rapidly changing guidelines.

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556. Evaluation of Hydroxychloroquine-based Combination Therapies for the Treatment of COVID-19

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Background: During the early COVID-19 pandemic a large number of investigational agents were utilized due to lack of therapeutic options. We evaluate the utility of commonly-used investigational agents combined with hydroxychloroquine (HCQ).

Methods: This multicenter observational cohort study included patients admitted with COVID-19 between March - May 2020 in Detroit, Michigan who received at least 2 doses of HCQ. Our primary outcome was the change in Sequential Organ Failure Assessment (SOFA) score from presentation to day 5 of HCQ therapy with a secondary outcome of in-hospital mortality. Data collected included demographics, Charlson Comorbidity index (CCI), daily SOFA score, laboratory data and COVID-directed therapies. Multiple linear regressions were performed to control for potential confounders between different therapies and change in SOFA score.

Results: Three hundred thirty-five patients receiving HCQ were included. Patients were 62 ± 14.8 years of age, male (54%) and African-American (82%) with a mean CCI of 1.7 ± 1.9. In our cohort, 32% were admitted to the intensive care unit and 35% expired. Therapies received by more than 20% of patients in addition to HCQ included azithromycin (80%), zinc (76%) and vitamin D (29%). In our unadjusted analysis, a significant improvement in SOFA score was observed with zinc (0.76) while no significant change was observed with azithromycin (-0.46) or vitamin D (0.05). However, there was no significant change in SOFA score after adjusting for confounders for azithromycin, zinc and vitamin D. No difference in mortality was observed between the groups.

Conclusion: Overall, no benefit in end-organ damage or mortality was observed with the addition of azithromycin, zinc or vitamin D to HCQ. Further studies are needed to confirm this observation.

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557. Impact of Concomitant Hydroxychloroquine Use on Safety and Efficacy of Remdesivir in Moderate COVID-19 Patients

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Background: Remdesivir (RDV) has been shown to shorten recovery time and was well tolerated in patients with severe COVID-19. Hydroxychloroquine (HQN) is an experimental treatment for COVID-19. Effects of coadministration of HQN with RDV have not been studied and are relevant given the long half-life (~22 days) of HQN. We report the impact of concomitant HQN and RDV use on clinical outcomes and safety in patients with moderate COVID-19.

Methods: We enrolled hospitalized patients with confirmed SARS-CoV-2 infection, oxygen saturation >94% on room air, and radiological evidence of pneumonia. Patients were randomized 1:1:1 to receive 5d or 10d of intravenous RDV once daily plus standard of care (SoC), or SoC only. We compared patients on concomitant HQN (HQN^{pos}) vs not (HQN^{neg}). Clinical recovery was evaluated using Cox proportional hazards. Covariate adjustment included age, sex, race, region, symptom duration, oxygen support status and obesity. Recovery and adverse events (AEs) were assessed through death, discharge, or d14.

Results: Of 584 patients, 199 (34%) received HQN (5d RDV: n=57 [30%]; 10d RDV, n=49 [25%]; SoC: n=93 [47%]). Through median follow-up of 13d (range 1-41d), HQN^{pos} patients on 5d or 10d RDV had a lower recovery rate (adjusted HR [95% CI] 0.78 [0.59, 1.03], p=0.09) with longer median time to recovery (8 vs 6 days) compared to HQN^{neg}. HQN^{pos} compared to HQN^{neg} patients in 5d RDV showed a trend of reduced recovery rate (HR: 0.69 [0.45,1.04], p=0.080); such an effect was not observed in 10d RDV or SoC (Table 1). More HQN^{pos} than HQN^{neg} patients had AEs in RDV (5/10d) or SoC arms evaluated separately, and all arms combined. This difference was significant for AEs and SAEs for all arms combined after covariate adjustment (Table 2).