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Letter

Cancer Care Disparities during the COVID-19 Pandemic: COVID-19 and Cancer Outcomes Study

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Patients with cancer, both active and previously treated, may be at higher risk of severe outcomes from COVID-19 compared to the general population (Dai et al., 2020; Bakouny et al., 2020; Westblade et al., 2020). Oncologists and health care systems have adapted the delivery of cancer care to mitigate the increased risk of morbidity and mortality from COVID-19 among oncology patients (Ürün et al., 2020). However, the ways in which the pandemic has incited changes in multidisciplinary cancer care remain poorly defined with minimal prospective data. In this multicenter, prospective cohort study of 2,365 outpatients receiving cancer care during the pandemic, we detail significant disruptions to routine cancer care and racial disparities in care disruption and COVID-19 outcomes.

The COVID-19 and Cancer Outcomes Study (CCOS) is a multicenter prospective cohort study comprised of adult patients (18 years or older) with a current or past history of hematological malignancy or invasive solid tumor who were scheduled for an outpatient medical oncology visit on the index week between March 2 and March 6, 2020, at the Tisch Cancer Institute, Icahn School of Medicine at Mount Sinai in New York City (MSSM), and the Dana-Farber Cancer Institute, Boston (DFCI). An electronic data capture platform was used to collect patient-, cancer-, and treatment-related variables during the 3 months prior to the index week (from December 2, 2019, hereafter referred to the baseline period) and 3-month

follow-up (until June 6, 2020, referred to as the pandemic period).

The primary objective was to examine the impact of COVID-19 on the delivery of cancer care as measured by the number of total visits, in-person outpatient visits, and telehealth visits. Secondary objectives included defining pandemic-related delays of planned oncologic care and COVID-19 diagnosis. To evaluate the correlates of changes in cancer care delivery, multivariable logistic regression models, with listwise deletion for missing data, that included the following independent variables were computed: self-reported race and ethnicity (non-Hispanic White, Hispanic, non-Hispanic Black, or Other), cancer center (DFCI or MSSM), cancer status (metastatic/active, localized/stable, or No Evaluable Disease [NED]/complete remission, with the former referring to solid malignancies and the latter hematologic malignancies), receipt of systemic therapy during the index period (yes or no), and tumor type (genitourinary, hematological, breast, thoracic, gastrointestinal, head and neck, or other solid tumor). For numbers of visits, per-patient differences in the numbers of visits in the pandemic period compared to the baseline period were used as the dichotomized dependent variables (any increase in telehealth visits, and any decrease in all or in-person visits). Adjusted odds ratios (aORs) and 95% confidence intervals (CIs) were reported. Wilcoxon signed-rank test was used to compare within-patient visit numbers

between periods. Median follow-up was determined using the inverse Kaplan-Meier method. All tests were two-tailed and considered statistically significant for $p < 0.05$. All analyses were done in the R statistical environment (v3.6.1).

Median age was 65 years (range, 20–90), and 1,278 (54.0%) patients were male. The racial and ethnic distribution included 1,346 (56.9%) non-Hispanic White patients, 299 (12.6%) non-Hispanic Black patients, and 297 (12.6%) Hispanic patients. Median follow-up was 84 days (95% CI, 82–84). In the 3-month pandemic period, 960 patients (40.6%) experienced a decrease in all visits, 1,219 (51.6%) had a decrease in in-person visits, and 760 (32.2%) had an increase in telehealth visits (Wilcoxon $p < 0.01$ for all three comparisons). When differences in visits were examined by race/ethnicity, after adjusting for cancer center, cancer status, receipt of systemic therapy, and tumor type, a significant reduction in overall visits was observed for Hispanic patients compared to White patients (aOR 1.34; 95% CI, 1.02–1.77; Table S1). No difference was demonstrated for Black or “Other” patients compared to White patients.

When adjusted for the same variables, no significant changes were demonstrated for in-person visits by race or ethnicity. However, Black (aOR 0.69; 95% CI, 0.50–0.94) and Hispanic patients (aOR 0.71; 95% CI, 0.51–0.98) were less likely to use telehealth during the pandemic period (Table S1).



During the 3-month follow-up period after the index date, 128 patients (5.5%) were diagnosed with COVID-19 infection. Of these, 122 (5.2% of all patients) had a positive SARS CoV-2 PCR or antibody test, and 6 (0.3% of all patients) were clinically presumed positive without a corresponding test. Non-Hispanic Black patients were more likely to experience COVID-19 infection (aOR 1.86; 95% CI, 1.10–3.11), as were Hispanic patients (aOR 3.19; 95% CI, 2.00–5.10; [Table S1](#)).

Based on narrative accounts provided in the electronic medical record (EMR), 239 patients (10.1%) had treatment delayed secondary to the pandemic. Of these, 48 (20.0%) were determined to be the direct result of COVID-19 infection. Treatment delays were more likely to be experienced by Hispanic patients (aOR 1.53; 95% CI, 1.03–2.26). No significant difference was demonstrated for Black patients (aOR 1.26; 95% CI, 0.84–1.88) or patients from “Other” ethnic groups. No ethnic or racial disparities were observed for delays in diagnostic imaging. During the pandemic period, 646 (27.3%) patients had a change of treatment compared to 734 (31.0%) during the baseline period. A relatively small subset of the decisions to change treatment were judged to be due to the pandemic ($n = 76$, 11.8%).

In conclusion, significant disruptions to cancer care were observed during the pandemic at tertiary institutions in New York and Boston. A significant decrease in outpatient visits and increase in telehealth visits were noted during the pandemic period. However, Black and Hispanic patients were less likely to have an increase in telehealth utilization and were more likely to develop COVID-19 infection compared to white patients. Hispanic patients were more likely than White patients to have pandemic-related delays in cancer care. Racial and ethnic barriers to the adoption of telehealth and related socioeconomic factors place members of these vulnerable populations at disproportionate risk for both COVID-19 infection and decreased cancer-related visits, thereby exacerbating existing health disparities. Sustained efforts to reduce racial and ethnic barriers to the adoption of tele-

health, as well as broader efforts to reduce the systemic inequities that place these populations at risk for COVID-19 infection, will be critical to narrowing disparities.

SUPPLEMENTAL INFORMATION

Supplemental Information can be found online at <https://doi.org/10.1016/j.ccell.2020.10.023>.

DECLARATION OF INTERESTS

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