Delay in head and neck cancer care during the COVID-19 pandemic and its impact on health outcomes

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Abstract: The coronavirus disease 2019 (COVID-19) outbreak has created unprecedented challenges for healthcare systems worldwide. Oncology services have been reorganized to decrease the risk of nosocomial acquisition of SARS-CoV-2, but changes in treatment pathways and follow-up cancer care can result in patients receiving suboptimal or delayed care. Herein, we describe a cross-sectional nested cohort study conducted to evaluate delays in care for patients with head and neck cancer (HNC) in post-treatment follow-up or palliative care during the COVID-19 pandemic in Northeast Brazil and its impact on health outcomes. Information was extracted from medical records and supplemented by telephone interviews. We compared the following health outcomes: self-perception of anxiety or sadness, fear of COVID-19 infection, cancer-related complications during social isolation, self-medication, diagnosis of COVID-19, and death between patients with and without delayed cancer care. The Mann-Whitney U test was used to compare distributions of continuous variables and the Fisher exact test was used for categorical variables. Thirty-one HNC patients were included in the study, and no case of confirmed SARS-CoV-2 was found. Delayed cancer care due to restriction in health services was reported in 58.1% of cases, and there was no report of telemedicine use during the COVID-19 outbreak. Cancer-related complications during the COVID-19 pandemic were described for most patients (67.7%) and included pain or discomfort, swelling, and dyspnea. Eight (25.8%) patients reported use of prescribed morphine or codeine to manage pain and six (19.4%) patients reported self-medication with over-the-counter (OTC) non-steroidal anti-inflammatory drugs (NSAIDs). We found an association between delayed HNC care and the use of self-medication (p = 0.028). This study indicated that patients with delayed HNC care during the COVID-19 outbreak are more likely to use self-medication with NSAIDs for pain management. Better strategies to follow HNC patients in socioeconomically disadvantaged communities need to be discussed and implemented.

Keywords: Head and Neck Neoplasms; Self Medication; COVID-19; SARS-CoV-2 Infection.

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Introduction

The coronavirus disease 2019 (COVID-19) pandemic has created new challenges for healthcare systems worldwide. COVID-19 was first reported in Wuhan, China, in late December 2019 and rapidly spread worldwide resulting in unprecedented changes to clinical practice. These included the interruption of non-essential or elective in-hospital treatments, increasing the risk of potential adverse health complications.1 During the COVID-19 pandemic, studies have discussed the management of routine cancer follow-up, especially among patients with head and neck cancer (HNC), due to the risk of the spread of SARS-CoV-2 during the daily trips to the hospital for radiation therapy and the increased susceptibility to infection associated with chemotherapy-induced immunosuppression.2 Moreover, most patients with HNC are older adults and may have other underlying medical conditions associated with morbidity and mortality for COVID-19.3

Recent studies have indicated that the continuation of in-hospital treatment for patients with HNC can be performed safely with the use of appropriate workflow, personal protective equipment (PPE), cleaning measures to sanitize patient exam and treatment rooms, and pre-operative screening for SARS-CoV-2 infection for those undergoing surgery.2,4,5,6 Delivering timely HNC care is increasingly recognized as critical to achieving optimal oncologic outcomes and delayed treatment may increase the risk of disease progression and death for these patients.7

It has been suggested that patients receiving post-treatment follow-up or palliative care should stay at home to avoid any visits to the hospital that are not strictly necessary. Remote follow-up using telemedicine to support post-treatment surveillance is to be preferred for non-essential medical visits whenever possible.8 However, teleconsultation technologies are not widely available, especially in limited-resource settings, and provide a limited examination for cancer patients needing evaluation. Moreover, there is a paucity of observational studies regarding delays in follow-up consultations for HNC patients and potential outcomes during the COVID-19 pandemic, especially in respect of communities with large disparities in health provision. We hypothesized that delayed cancer care during the COVID-19 outbreak would be associated with worse outcomes. In this study, we evaluated the delay in care for HNC patients in post-treatment follow-up or palliative care during the COVID-19 pandemic in Sergipe state, Northeast Brazil, and its impact on health outcomes.

Sergipe is the smallest state (21 925 square kilometers) in Brazil with approximately 2.3 million residents and a Human Development Index (HDI) of 0.665. The first case of COVID-19 was reported on March 14, 2020 and by October 27, 2020 more than 83,000 cases of disease and 2184 deaths had been registered.9 In addition, Sergipe has the highest incidence rate of oral cancer among women (5.89 cases per 100,000 women) and the seventh highest incidence among men (11.55 cases per 100,000 men) in the country.10

Methodology

This was a cross-sectional study nested in a cohort of patients with HNC treated in the Hospital de Urgência de Sergipe, which is the public hospital of reference for the treatment of cancer in Sergipe state, Northeast Brazil. Our cohort comprises patients who were diagnosed with HNC including oral cavity, pharynx, larynx and salivary gland cancers between August 2017 and August 2019 and were referred for oncologic treatment (surgery, radiotherapy, and/or chemotherapy) in this hospital. Of the 88 patients enrolled in this cohort, 33 were alive on January 1, 2020 and were followed until July 30, 2020. During this period, two were lost to follow-up. All the remaining patients were receiving post-treatment follow-up or palliative care at home. Information on all the patients included in this cross-sectional study were extracted from medical records and supplemented by telephone interviews.

In this study, we included data on demographic and socioeconomic characteristics, cancer staging according to the TNM classification (from early [I-II] to advanced tumor stage [III-IV]),11 oncological treatment previous to the COVID-19 outbreak, underlying
medical conditions, number of household members, adherence to COVID-19 prevention and control measures, household contact with people tested positive for SARS-CoV-2 infection, use of telemicine (defined as the provision of health care remotely via information and communications technology), and delayed cancer care during the COVID-19 outbreak.

Health outcomes included self-perception of anxiety and sadness, fear of COVID-19 infection, cancer-related complications during social isolation, self-medication, diagnosis of COVID-19, and death. Self-reported anxiety and sadness were assessed, respectively, using the following questions: “Are you nervous, uneasy, or anxious?” and “Are you sad or angry?”. Self-medication was defined as the selection and individual use of medicines to alleviate symptoms related to cancer.

Continuous variables were expressed as medians and interquartile range (Q1 - Q3). For the categorical variables, counts (n) and percentages (%) were used. We compared health outcomes between patients with and without delayed cancer care. Comparisons were also performed according to age, sex, marital status, income, and use of telemicine for cancer care. The Mann-Whitney U test was used to compare distributions of continuous variables and the Fisher exact test for categorical variables. The significance level was set at 5%. Analyses were performed using JASP software version 0.13 (JASP Team, Amsterdam, Netherlands). This study was approved by the ethics committee of the Federal University of Sergipe, Brazil (reference number 68035317.3.0000.5546).

### Results

Of the 31 HNC patients evaluated in this study, 24 (77.4%) were men, the median age was 55.0 years (44.5 – 69.5), most were not married (n = 17, 54.8%), had less than nine years of schooling (n = 26, 83.9%), and received a monthly income less than one Brazilian minimum wage (~192 USD) (n = 23, 74.2%). The median of household members was 3.0 (2.0–4.0). Patients had advanced-stage (III-IV) cancer and were treated with surgical resection plus radiotherapy (n = 1, 3.2%), or radiotherapy plus chemotherapy with (n = 14, 45.2%) or without (n = 16, 51.6%) surgical resection. Most cases were diagnosed in the oral cavity (n = 15, 48.4%) and pharynx (n = 8, 25.8%) and eight (25.8%) patients had underlying medical conditions including hypertension, diabetes, and heart disease. Delayed cancer care due to restrictions in the provision of health services was registered in 58.1% of cases (18 out of 31). There was no report of telemedicine use during the COVID-19 outbreak.

Cancer-related complications during the COVID-19 pandemic were described for most patients enrolled in this study (n = 21, 67.7%) and included pain or discomfort (n = 14), swelling (n = 9), and dyspnea (n = 5). Eight (25.8%) patients reported use of prescribed morphine or codeine to manage pain, and six (19.4%) patients reported use of self-medication with over-the-counter (OTC) non-steroidal anti-inflammatory drugs (NSAIDs). Twelve patients reported not wearing a face mask, 33.3% (4 out of 12) due to local pain or discomfort.

Three (9.7%) HNC patients reported household contact with people tested positive for SARS-CoV-2, but only one patient described symptoms suggestive of COVID-19 including cough and musculoskeletal pain. These symptoms lasted for seven days and laboratory tests for SARS-CoV-2 infection were not performed. Fear of COVID-19 infection and feelings of anxiety and sadness were, respectively, described by 41.9% (n = 13), 71.0% (n = 22), and 45.2% (n = 14) of patients. Six (19.4%) patients died from cancer within the follow-up period. Characteristics of the study population are summarized in Table 1. We found an association between delayed HNC care and the use of self-medication (p = 0.028) (Table 2).

### Discussion

In response to the COVID-19 pandemic, oncology services have been reorganized worldwide to ensure that patients continue to receive essential care while minimizing the risk of nosocomial acquisition of SARS-CoV-2. However, cancer-diagnostic facilities and treatment pathways have been altered, and follow-up cancer care has been deprioritized in some countries in favor of supporting health systems to react to the COVID-19 pandemic, which can result in patients receiving suboptimal or delayed care.
Table 1. Demographic, socioeconomic, clinical characteristics, and behavior of HNC patients during COVID-19 pandemic.

| Variable                                      | Patients (n = 31) |
|-----------------------------------------------|------------------|
| Age (years), median (Q1 – Q3)                | 55.0 (44.5–69.5) |
| Sex                                           |                  |
| Male                                          | 24 (77.4%)       |
| Female                                        | 7 (22.6%)        |
| Level of education                            |                  |
| ≤ 9 years of schooling                        | 26 (83.9%)       |
| > 9 years of schooling                        | 5 (16.1%)        |
| Marital status                                |                  |
| Married                                       | 14 (45.2%)       |
| Not married                                   | 17 (54.8%)       |
| Income less than one minimum wage             | 23 (74.2%)       |
| Comorbidities                                 | 8 (25.8%)        |
| Cancer stage                                  |                  |
| I–II                                          | 0 (0)            |
| III–IV                                        | 31 (100.0%)      |
| HNC sites                                     |                  |
| Oral cavity                                   | 15 (48.4%)       |
| Pharynx                                       | 8 (25.8%)        |
| Larynx                                        | 6 (19.4%)        |
| Salivary glands                               | 2 (6.4%)         |
| Household members, median (Q1 – Q3)           | 3 (2 – 4)        |
| Facemask adherence                            |                  |
| Yes                                           | 19 (61.3%)       |
| No                                            | 12 (38.7%)       |
| Household contact with people tested positive for SARS-CoV-2 | |
| Yes                                           | 3 (9.7%)         |
| No                                            | 28 (90.3%)       |
| Delayed cancer care during COVID-19 outbreak  |                  |
| Yes                                           | 18 (58.1%)       |
| No                                            | 13 (41.9%)       |
| Use of telemedicine for follow-up cancer care during COVID-19 outbreak | 0 (0) |
| Cancer-related complications during COVID-19 outbreak | |
| Yes                                           | 21 (67.7%)       |
| No                                            | 10 (32.3%)       |
| Self-medication                               |                  |
| Yes                                           | 6 (19.4%)        |
| No                                            | 25 (80.6%)       |
| Fear of COVID-19 pandemic                     |                  |
| Yes                                           | 13 (41.9%)       |
| No                                            | 18 (58.1%)       |
Our study highlights the large proportion of HNC patients with delayed cancer care due to restrictions in health services and impacts on health outcomes, especially related to pain management.

Ensuring the continuum of care in cancer patients is vital and should be considered a major priority during this time. Deciding to delay or suspend medical care for a period based on clinical judgments, taking into consideration the balance between decreasing the risk of nosocomial SARS-CoV-2 infection and worsening cancer outcomes due to the absence of sufficient cancer care, is a health care ethical dilemma. However, maintaining the routine of care for patients with chronic diseases during the COVID-19 outbreak in settings with limited resources has been an even greater challenge.

Interestingly, no patient was diagnosed with COVID-19, even among those who continued to have their regular face-to-face consultations at the hospital. The major problem found in this study was the large number of advanced-stage HNC patients reporting cancer-related complications including pain and edema, and the use of self-medication with NSAIDs, especially in cases of delayed cancer care. Unfortunately, most people in limited-resource regions are diagnosed in a late stage of disease and the prognosis is poor. In addition, patients with advanced-stage cancer commonly report pain during and after oncological treatment which is an important predictor of disability with significant implications for physical and psychological functioning. The synergistic effects of cancer and the COVID-19 pandemic can have a devasting impact on the mental health of these people, especially for those who are not under regular medical care.

| Table 2. Characteristics of HNC patients with delayed follow-up consultation or palliative care during COVID-19 pandemic. |
|---------------------------------------------------------------|
| **Variable** | **Delayed cancer care** | **p-value*** |
| | Yes (n = 18) | No (n = 13) | |
| Age (years), median (Q1 – Q3) | 51.0 (39.0–70.3) | 56.0 (45.5–64.5) | 0.535 |
| Male | 12 (66.7%) | 12 (92.3%) | 0.191 |
| ≤ 9 years of schooling | 14 (77.8%) | 12 (92.3%) | 0.368 |
| Not married | 11 (61.1%) | 6 (46.2%) | 0.481 |
| Income less than one minimum wage | 12 (66.7%) | 11 (84.6%) | 0.412 |
| Cancer-related complications during isolation | 13 (72.2%) | 8 (61.5%) | 0.701 |
| Self-medicaton | 6 (33.3%) | 0 (0) | 0.028* |
| Fear of COVID-19 pandemic | 10 (55.6%) | 3 (23.1%) | 0.139 |
| Self-perception of anxiety | 15 (83.3%) | 7 (53.8%) | 0.114 |
| Self-perception of sadness | 9 (50.0%) | 5 (38.5%) | 0.717 |
| Death | 4 (22.2%) | 2 (15.4%) | 1.000 |
* p-values less than 0.05 were considered statistically significant.
Chronic pain has been described in up to 50% of HNC patients at 1-year after treatment, and 40% of patients receiving pain medication report inadequate relief. The pain and discomfort described by the patients in this study contributed to the low adherence to the use of facemasks, which is an important physical intervention against SARS-CoV-2 transmission. Management of pain for patients with HNC cancer is complex and should be based on the World Health Organization (WHO) ‘pain ladder’. Moreover, counseling sessions and honest communication are important parts of managing psychological symptoms, while drugs play a role in pain relief. Recognizing that changes in cancer services during the current COVID-19 outbreak increase the possibility of chronic pain, strategies to follow HNC patients receiving post-treatment follow-up or palliative care should be prioritized.

Patients reporting delays in cancer care during the COVID-19 outbreak were more likely to use self-medication with a risk of duplicate prescribing, medication overdoses and adverse interactions. In this respect, remote consultations may have an important role in surveillance and clinical case management. It has been suggested that post-cancer treatment face-to-face consultations during the COVID-19 outbreak should kept to a minimum and reserved for patients with concerning symptoms. Monitoring should be performed through video calls or phone consultations, and the cessation of follow up of any kind should not be considered acceptable.

Although switching outpatient consultations online or to phone rather than face-to-face consultations is being universally adopted by oncology services, no use of telemedicine was described by the patients in this report. Poverty and lack of education have been shown to be the biggest barriers to the practice of telemedicine in low- and middle-income countries, especially in rural areas. In addition, in Brazil, despite telehealth becoming more common in the delivery of health care, there remain institutional and professional barriers that need to be overcome to facilitate the process of telemedicine dissemination and consolidation.

This study has some limitations. First, delayed cancer care was not evaluated before the COVID-19 outbreak and a longitudinal evaluation was not performed, thereby restricting the inferences that can be made from a cross-sectional analysis. Second, the interviews to collect data were conducted by phone due to the COVID-19 outbreak and were of short duration, making assessing the health status of patients, rapport development, and the use of long questionnaires difficult. However, this method enhanced safety, reduced the need to travel and decreased the risk of SARS-CoV-2 infections inherent in a face-to-face approach. Finally, this study was also limited by sample size, since most of the patients included in the cohort died in a short time.

Conclusion

This study indicated that patients with delayed HNC care during the COVID-19 outbreak are more likely to use self-medication with NSAIDs for pain management. Better strategies to address and monitor HNC patients in socioeconomically disadvantaged communities need to be developed with funding prioritizing the use of new technologies to improve access to remote care and to ensure essential medicines for cancer pain relief during the current pandemic.

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