Impact of the COVID-19 virus pandemic on hospitalizations for skin cancer treatment in Brazil

Impacto da pandemia do vírus COVID-19 nas internações para tratamento de câncer de pele no Brasil

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Original Article

Introduction: COVID-19 virus infection was a severe health impact in 2020. The direct repercussion is easily measured through its morbidity and mortality rates. Its indirect repercussion on health is still little measured, and this is the objective of this study. Methods: To determine the number of hospitalizations for general treatments, for the treatment of neoplasms and malignant skin cancer in the SUS, from 2008 to 2020, in the department of informatics of the SUS. Results: The parallelism of the data referring to the three groups selected above allowed to observe a drastic reduction in the number of hospitalizations in the SUS between the same months of 2019 and 2020: a decrease of 10.60% in general hospitalizations, 58.65% in hospitalizations for neoplasia and 156% in hospitalizations for malignant skin cancer. The reduction gradually worsened in 2020 from January. In June 2020, the number of hospitalizations for skin cancer treatment reflected values from 12 years ago. Conclusion: The follow-up of the historical series of hospitalizations in the SUS provides a tangible value that serves as a basis for understanding the direction of health measures. The indirect implications of COVID-19 may have an outcome as tragic as its mortality, as they impact specialized health services availability. Services of great specialization such as hospital cancer treatment attend complex cases, and their unavailability may reflect an increase in mortality from these causes - an indirect impact of COVID-19.

Keywords: Coronavirus infections; Skin neoplasms; Melanoma; Basal cell carcinoma; Neoplasms.
INTRODUCTION

Skin neoplasms are a broad group of diseases, and malignant neoplasms receive greater clinical emphasis due to their epidemiology and outcomes that are largely preventable with early treatment. Skin cancers are the most common neoplasms globally, with an estimated 2 to 3 million incidences in the non-melanoma type and 132,000 in melanoma per year. It is estimated that 1 in 3 diagnosed cancers occurs on the skin.

Brazil mirrors global epidemiology and has an estimated annual incidence of 185,380 cases by 2020, with 4,120 deaths in 2018. In this scenario, skin cancer is the neoplasm with the highest annual incidence.

Neoplasms are the second leading cause of mortality in Brazil, but most skin cancers have a good prognosis when diagnosed and treated early. This is why maintaining and improving cancer approach programs is important.

The year 2020 is being marked by the fatalities and changes required to cope with the COVID-19 virus. Therefore, this study’s importance is justified since it is necessary that, given the impact on skin neoplasms’ treatment due to the influence of the COVID-19 pandemic, it is important to look for means that minimize its consequences.

OBJECTIVES

This work aims to measure the evolution of hospitalizations in general for neoplasms and skin cancer in the period 2008-2020 and, from these data, quantify the impact on the number of hospitalizations for skin cancer treatment.

METHODS

An epidemiological study was conducted in the DATASUS database (TABNET) covering Brazilian municipalities from January 2008 to June 2020 regarding hospital admissions, elective and urgent hospitalizations, for the treatment of chapters ICD-10, “malignant neoplasm of the skin,” and “other malignant neoplasms of the skin.”

This was followed by normative resolution number 510 of April 7, 2016, of the Ministry of Health, which defines the researches that use public access.
information, made in databases, whose information is aggregated, without the possibility of individual identification and do not need to go through the research ethics committee (CEP)

The information system of the Ministry of Health has already published data for the first six months of 2020 and, for this reason, was the period of choice determined to create parallelism with previous years regarding the number of hospitalizations in the chosen groups, the character of hospitalization (elective x urgency) and percentage evolutions. These data were analyzed by the authors of this study in meetings at Santa Casa de Montes Claros.

RESULTS

The hospitalizations performed in the Unified Health System, between January and June 2008 and 2020, were tabled and analyzed, resulting in figures 1A, 1B and 1C and Table 1. There was an increase in the total number of hospitalizations for all causes from 2008-2019: the total number of hospitalizations increased 10.60%, the number of hospitalizations for neoplasms increased 58.65%, and the total number of hospitalizations for skin cancer increased by 156.24%.

The first six months of 2020 showed a numerical reduction in hospitalizations in the three groups compared to the same months of 2019: general hospitalizations reduced by 26.69%, hospitalizations for all neoplasms reduced by 26.12%, while malignant skin neoplasms reduced by 33.03%.

The percentage changes over the previous year, in the first six months of each year, 2008-2020, are recorded in figure 2.

The number of hospitalizations for skin cancer studied in the first six months of the period is shown in Figure 3 and Table 2.

Figure 4 shows the evolution of elective and urgent hospitalizations for skin cancer treatment from January to June 2008 to 2020.

DISCUSSION

The direct and indirect impact of COVID-19 infection is not yet fully known. The possible theorized indirect results are reduced hospitalizations to other diseases due to the scarcity of SUS resources or its contingency. Another French study, still in progress, confirms in its preliminary reports a similar trend, with a drastic reduction in terms of screening (-86%), diagnosis (-39%) treatment (-30%) when compared to the same period of 2019.

The analysis of figures 1 and 2 and table 1 revealed that there was an increase in hospitalizations in the three groups from 2008 to 2019: general hospitalizations increased by 582,326 (10.60%), hospitalizations for skin cancer studied in the first six months of the period is shown in Figure 3 and Table 2.

The evolution of elective and urgent hospitalizations for skin cancer treatment from January to June 2008 to 2020.
Table 1. Number of general hospitalizations, neoplasms and skin cancer in Brazil in the first six months (2008-2020).

| Year | All admissions | Neoplasms | Skin cancer |
|------|---------------|-----------|-------------|
| 2008 | 5,495,649     | 272,415   | 10,820      |
| 2009 | 5,518,042     | 278,240   | 11,639      |
| 2010 | 5,717,400     | 302,015   | 13,095      |
| 2011 | 5,730,321     | 310,662   | 13,702      |
| 2012 | 5,666,376     | 330,234   | 14,947      |
| 2013 | 5,596,107     | 335,941   | 16,000      |
| 2014 | 5,654,255     | 354,641   | 17,426      |
| 2015 | 5,747,574     | 371,718   | 18,954      |
| 2016 | 5,746,614     | 380,344   | 20,680      |
| 2017 | 5,747,733     | 393,835   | 22,933      |
| 2018 | 5,921,025     | 411,028   | 25,592      |
| 2019 | 6,077,975     | 432,190   | 27,725      |
| 2020 | 4,455,777     | 319,297   | 18,567      |

The comparison of the first six months of 2019 and 2020 revealed a reduction in the total and the proportional number of hospitalizations: general hospitalizations decreased by 1,622,198 (26.69%), cancer in general increased by 159,775 (58.65%), and hospitalizations for skin cancer increased by 16,905 (156.24%).

The drop in the number of hospitalizations shows how skin cancer treatment may have been affected, similar to what occurred in England, where there was a statistically significant reduction in skin cancer diagnoses of 68.61%.

Monthly hospitalizations for skin cancer in 2020 gradually reduced. January 2020 still increased compared to 2019, while February, March, April, May and June 2020 were equivalent to the number of hospitalizations with the same months of 2019, 2016, 2010 and before 2008. The impact of this change is best understood in Figure 5.

In line with other international projections, this trend in reducing the number of cases treated may lead to a late diagnosis, with a worse prognosis in this cancers.

Figure 4 shows that the rates of elective and urgent surgeries maintained their general downward trend from 2008 (40% of urgent surgeries) until 2020 (19.88%), with small variances, which shows no change to urgency in elective cases.

Given the absence of adequate diagnosis and treatment, there can be a considerable increase in severity cases, according to studies by Tejera-Vaquerizo et al. (2020), which estimated increased size and depth.
Table 2. Hospitalizations for skin cancer treatment in Brazil in the first six months (2008-2020).

| Year | January | February | March | April | May | June |
|------|---------|----------|-------|-------|-----|------|
| 2009 | 1.638   | 1.591    | 2.155 | 2.017 | 2.149| 2.089|
| 2010 | 1.877   | 1.798    | 2.510 | 2.177 | 2.395| 2.338|
| 2011 | 2.119   | 2.294    | 2.310 | 2.165 | 2.581| 2.233|
| 2012 | 2.222   | 2.128    | 2.690 | 2.561 | 2.889| 2.457|
| 2013 | 2.409   | 2.200    | 2.640 | 3.027 | 2.821| 2.903|
| 2014 | 2.627   | 2.821    | 2.760 | 3.003 | 3.257| 2.958|
| 2015 | 2.764   | 2.551    | 3.588 | 3.199 | 3.442| 3.410|
| 2016 | 2.918   | 2.970    | 3.774 | 3.593 | 3.683| 3.742|
| 2017 | 3.234   | 3.214    | 4.336 | 3.619 | 4.490| 4.040|
| 2018 | 3.923   | 3.714    | 4.412 | 4.585 | 4.478| 4.480|
| 2019 | 4.235   | 4.492    | 4.491 | 4.800 | 5.205| 4.502|
| 2020 | 4.482   | 4.150    | 3.738 | 2.156 | 2.328| 1.713|

Source: DATASUS, 2020.

of squamous cell carcinoma and melanomas in Spain during the pandemic. It was noticed in this study when there is a delay of 3 months in the diagnosis the projection and reduction of the survival in 5 years of 5.2% for squamous cell carcinoma (SCC) and up to 30.2% months for the melanoma.

CONCLUSION

This study shows that SUS resources’ contingency led to a reduction in the total number of hospitalizations, returning to lower monthly levels than 12 years ago. This isolated data is an important indication of the indirect impact of the COVID-19 pandemic, as it represents real, measurable and up-to-date data on the change of approaches to other pathologies in this particular period.

Due to the delay in the various stages of approach to skin cancers, efforts should be made to minimize the pandemic’s impact. In this context, we can highlight the standardization of conducts, according to guidelines developed by institutions, such as the National Comprehensive Cancer Network. Besides, it is necessary to facilitate the patient’s access to the health system, and telemedicine, cited in several sources as a facilitator of the follow-up of these cases, is necessary.

In the specific case of skin cancer requiring reconstruction in a hospital environment (and not just outpatient), these are patients with complex lesions. A few months may undoubtedly represent the difference between curative surgery or just
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Due to acute and chronic diseases, the mortality curves presented in the coming years will attest to the meaning of this fall in hospitalizations.

COLLABORATIONS

**IFV**
- Analysis and/or data interpretation, Data Curation, Formal Analysis, Investigation, Project Administration, Writing - Original Draft Preparation, Writing - Review & Editing

**TRWC**
- Analysis and/or data interpretation, Conceptualization, Data Curation, Final manuscript approval, Formal Analysis, Investigation, Methodology, Project Administration, Resources, Supervision, Validation, Visualization, Writing - Original Draft Preparation, Writing - Review & Editing

**LRS**
- Analysis and/or data interpretation, Conceptualization, Final manuscript approval, Formal Analysis, Writing - Review & Editing

**LAT**
- Conceptualization, Data Curation, Final manuscript approval, Formal Analysis, Writing - Original Draft Preparation, Writing - Review & Editing

**OJDM**
- Analysis and/or data interpretation, Conceptualization, Final manuscript approval, Writing - Original Draft Preparation, Writing - Review & Editing

**DFS**
- Data Curation, Formal Analysis

**DSR**
- Data Curation, Formal Analysis, Resources, Writing - Review & Editing

**PCA**
- Data Curation, Formal Analysis, Methodology

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