COVID-19 in Oncologic Patients: a Clinical-Epidemiological Profile Review

doi: https://doi.org/10.32635/2176-9745.RBC.2020v66nTemaAtual.1046

Covid-19 em Pacientes Oncológicos: uma Revisão do Perfil Clínico-Epidemiológico

Covid-19 en Pacientes con Cáncer: una Revisión del Perfil Clínico-Epidemiológico

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Abstract

Introduction: Since the beginning of COVID-19 pandemic, studies indicate that oncologic patients represent one of the main risk groups. **Objective:** To synthesize the literature addressing clinical and epidemiological profile of oncologic patients with COVID-19. **Method**: A systematic review of the literature was carried out in the PubMed database, utilizing the descriptors COVID-19, SARS-CoV-2, 2019-nCoV, n-CoV and coronavirus combined with cancer, tumor and malignancy. **Results**: Of the 821 articles found, nine texts were included in the qualitative analysis, totaling 39 individuals, predominantly male (74.4% men): China (6 texts, 35 patients), Nigeria (1 text, 1 patient), France (1 text, 2 patients), Denmark (1 text, 1 patient). Lung (51.3%; n=20) and breast (10.3%; n=4) cancers were the most prevalent. In 87.2% (n=34), information about life habits were not reported. Respiratory symptoms (46.8%; n=18) and fever (43.6%; n=17) stood out. Six patients died (15.4%), four were discharged due to cure (10.2%), two remained hospitalized until the study was published (5.2%) and for the other patients (69.3%, n=27), the manuscript did not inform the outcome . **Conclusion**: Adequate care for this special group of patients when infected with the new coronavirus is essential in pursuing better outcomes. Further studies are still needed to better understand how COVID-19 behaves in cancer patients.

Key words: Coronavirus Infections; Neoplasms/epidemiology; Review.

Resumo

Introdução: Desde o início da pandemia de Covid-19, estudos apontam que pacientes oncológicos representam um dos principais grupos de risco. **Objetivo:** Sintetizar a literatura no que se refere ao perfil clínico-epidemiológico de pacientes oncológicos com Covid-19. **Método**: Revisão integrativa da literatura a partir da base PubMed, utilizando os descritores *COVID-19, SARS-CoV-2, 2019-nCoV, n-CoV e coronavirus* combinados com *cancer, tumor e malignancy*. **Resultados**: Dos 821 artigos encontrados, nove textos foram incluídos na análise qualitativa, totalizando 39 indivíduos, com predomínio do sexo masculino (74,4% homens): China (6 textos, 35 pacientes), Nigéria (1 texto, 1 paciente), França (1 texto, 2 pacientes) e Dinamarca (1 texto, 1 paciente). Os cânceres de pulmão (51,3%; n=20) e de mama (10,3%; n=4) foram os mais prevalentes. Em 87,2% (n=34), não foram relatadas informações sobre hábitos de vida. Os sintomas respiratórios (46,8%; n=18) e febre (43,6%; n=17) se destacaram. Seis pacientes foram a óbito (15,4%), quatro receberam alta por cura (10,2%), dois permaneceram internados até a publicação do estudo (5,2%) e sobre os demais (69,3%, n=27) o manuscrito não informava o desfecho. **Conclusão**: O cuidado adequado a esse grupo especial de pacientes quando infectados pelo novo coronavírus é fundamental em busca de melhores desfechos. Mais estudos ainda são necessários para uma melhor compreensão de como a Covid-19 se comporta em pacientes com câncer.

Palavras-chave: Infecções por Coronavirus; Neoplasias/epidemiologia; Revisão.

Resumen

Introducción: Desde el comienzo de la pandemia de Covid-19, los estudios indican que los pacientes con cáncer representan uno de los principales grupos de riesgo. **Objetivo:** Sintetizar la literatura sobre el perfil clínico-epidemiológico de pacientes con cáncer además de Covid-19. **Método**: Revisión integral de la literatura utilizando la base de datos PubMed, con los descriptores COVID-19, SARS-CoV-2, 2019-nCoV, n-CoV y coronavirus combinados con cáncer, tumor y malignidad. **Resultados**: De los 821 artículos encontrados, se incluyeron nueve textos en el análisis cualitativo, totalizando 39 individuos, predominantemente hombres (74.4% hombres): China (6 textos, 35 pacientes), Nigeria (1 texto, 1 paciente), Francia (1 texto, 2 pacientes), Dinamarca (1 texto, 1 paciente). Los cánceres de pulmón (51,3%; n=20) y de mama (10,3%; n=4) fueron los más prevalentes. En 87,2% (n=34) del total, no se informó ninguna información acerca de hábitos de vida. Se destacaron los síntomas respiratorios (46,8%; n=18) y fiebre (43,6%; n=17). Seis pacientes fallecieron (15,4%), cuatro fueron dados de alta por cura (10,2%), dos permanecieron hospitalizados hasta que se publicó el estudio (5,2%) y en los otros (69,3%, n=27) el manuscrito no informó el resultado. **Conclusión**: La atención adecuada para este grupo especial de pacientes cuando se infectan con el nuevo coronavirus es esencial en la búsqueda de mejores resultados. Todavía se necesitan más estudios para comprender mejor cómo se comporta Covid-19 en pacientes con cáncer.

Palabras clave: Infecciones por Coronavirus; Neoplasias/epidemiología; Revisión.

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INTRODUCTION

The novel coronavirus was reported for the first time in the city of Wuhan, capital of the province of Hubei, in China[1]. Named Sars-CoV-2 (severe acute respiratory syndrome coronavirus 2), the virus, responsible for COVID-19 (coronavirus disease 2019) spread rapidly worldwide, resulting in a Public Health Emergency in February 2020. The next month (March 11), the World Health Organization declared pandemic[2].

Even with the efforts that are being taken to attempt to contain the pandemic advance, in May 14, there were 4.3 million confirmed cases and 278 thousand deaths resulting from the novel coronavirus in the world. USA (1.3 million) and Russia (252 thousand) were in the top two positions in number of cases identified, respectively. In number of deaths, USA (84 thousand) and United Kingdom (33 thousand) were the first ranked[3].

Understanding the role of chronic diseases, as cancer, as modifiers and/or aggravation of the natural course of COVID-19, assumes an important function in the pandemic scenario. Patients with cancer are a vulnerable populational group because they have more odds of presenting the severe form of the disease in comparison with patients without cancer[4]. The disease itself and its treatments, as chemotherapy and radiotherapy are immunossupressors[5,6], can raise the risk of worsening and death by COVID-19. In addition, these patients are frequently called to the hospital for treatment and monitoring, which increases the risk of becoming ill with COVID-19[4,6,7].

Considering the importance of this group of risk and the absence of investigations about it, this article attempted to summarize the literature on the clinical-epidemiological profile of oncologic patients with COVID-19.

METHOD

Integrative review of the literature including scientific articles that detailed the clinical and epidemiological characteristics of the oncological patients with COVID-19. Articles published in the database PubMed between January 1st and April 30th, 2020 were selected utilizing the descriptors *COVID-19, SARS-CoV-2, 2019-nCoV, n-CoV and coronavirus* combined with *cancer, tumor and malignancy*. Data collection was performed on April 30, 2020.

In the study, clinical trials, cohorts, cross-sectional, clinical cases and series of cases (published or in preprint) were included. The following exclusion criteria were adopted: government epidemiologic reports, comments, review of the literature and articles without access to the complete content. After searching the texts, three authors, independently, performed the next stages of the investigation: 1 - reading the title and abstract; 2 – reading the full article; 3 – data collection about the occupation and construction of the database. Two other investigators independently conducted the analysis. Next, the differences were reviewed by the investigation team.

RESULTS

Initially, 825 articles were encountered. Of these, 92 were selected for full reading. In the end, only nine texts[4,7-14] contained clinical and epidemiological information of patients with cancer who were infected by the new coronavirus, totaling 39 individuals predominantly males (74.4%), and from four countries: China (6 texts, 35 patients); Nigeria (1 text, 1 patient); France (1 text, 2 patients) and Denmark (1 text, 1 patient) (Figure 1 and Table 1).

Among the types of cancers, lung cancer stood out corresponding to 51.3% (n=20) of the patients, followed by breast cancer with 10.3% (n=4) and colon cancer with 7.7% (n=3). The other types, when grouped, reached the remaining 28.7% (n= 12). About habits of life, 13.8% (n=5) of the individuals were smokers and in 87.2% (n=34) this information was not provided. Among the signs and symptoms encountered, the following were the most remarkable: respiratory symptoms (46.8%; n=180) and fever (43.6%; n=17). In relation to outcomes, six patients died (15.4%), four were discharged because they were cured (10.2%), two remained hospitalized until the publication of the study (5.2%) and others (69.3%, n=27) were not informed (Table 2).

DISCUSSION

The novel coronavirus became a world threat and the main sanitary concern of the XXI century. Among the risk groups, the literature has indicated that patients with comorbidities are more susceptible of presenting manifestations related to the novel coronavirus[6,7].

According to a cohort Chinese study involving 1,590 cases of COVID-19, of which 18 patients had cancer, it was observed that these patients had higher risk of developing serious events (admission at the intensive care unit, necessity of invasive mechanic ventilation or death) in comparison with patients without cancer: 39% *versus* 8%, respectively[4].

Within the global context, oncology started to be affected in its multiple forms. Practically, cancer treatment, either with drugs or surgical in patient with COVID-19 is argued because of the lack of solid evidences and recommendations about the management of this clinical group. In addition,

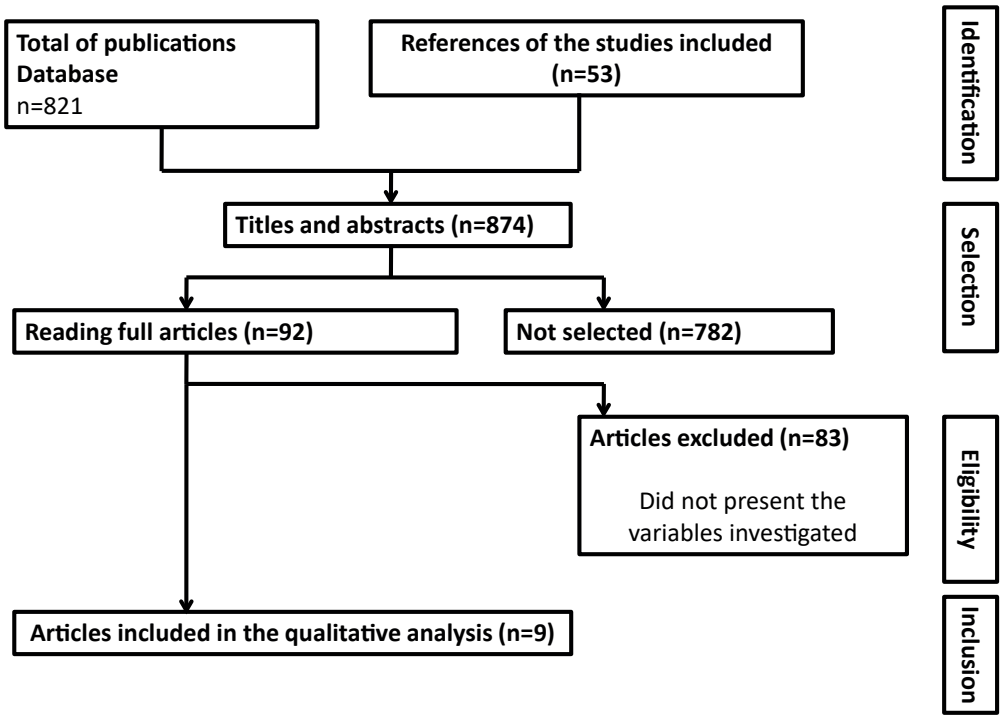

Figure 1. Flowchart of the selection of the articles, 2020

Table 1. General characterization of articles included in the study, 2020

Study	Country	N total (cancer)	Type of study	Males	Females	Age structure
Liang et al.[4]	China	18	Retrospective	12	6	Mean: 63.1 years
Leonetti et al.[7]	France	2	Case report	2	0	Age: 57 years
Tian et al.[8]	China	2	Case report	1	1	Mean: 78.5 years
Qu et al.[9]	China	1	Case report	0	1	Age: 46 years
Salako et al.[10]	Nigeria	1	Cross-sectional	1	0	Age: 67 years
Yu et al.[11]	China	12	Retrospective	10	2	Mean age: 66 years
Zhang et al.[12]	China	1	Case report	1	0	Age: 57 years
Ouyang et al.[13]	China	1	Case report	1	0	57 years
Suppli et al.[14]	Denmark	1	Case report	1	0	74 years
Total		39		74.4%	25.6%	Mean age: 62.85

oncologic patients need continuous care and its continuation implies in going to hospital environments, increasing the possibility of exposure to the virus[6].

The scientific literature indicates that the patients with cancer, because of their age-range (older adults) present other risk factors (as hypertension and diabetes) that added to cancer, makes COVID-19 much more aggressive. In addition, it has been noticed that the patients submitted to more invasive treatments, as surgery and chemotherapy present bigger risk of evolving with more serious clinical events[4,10-15].

Oncologic patients, by itself, are more challenging. Both the disease and the treatment can promote physiological changes that compromise the immunity and modify the manner the organism responds to other diseases, as the infectious, for example[11-13]. In this context, the diagnosis, the clinical presentation and the therapeutic support become more difficult for the medical community.

An example of this are the radiographic findings where, many times, the typical characteristics of COVID-19 may not signify the presence of the disease, since there are reports in the literature that showed the incompatibility

Table 2. Clinical and epidemiological characterization (n=39), 2020

Variable	N	%
Type of cancer		
Lung	20	51.3
Breast	4	10.3
Kidney	1	2.6
Rectum	2	5.1
Colon	3	7.7
Colorectal	1	2.6
Pancreas	1	2.6
Urothelial	1	2.6
Bladder	2	5.1
Adrenal	1	2.6
Thyroid	1	2.6
Multiple myeloma	1	2.6
Lymphoma	1	2.6
Signs/symptoms		
Asymptomatic	1	2.6
Fever	17	43.6
Cough	9	23.6
Dyspnea	4	10.3
Myalgia	3	7.7
Fatigue	2	5.2
Diarrhea	1	2.6
Nausea or vomit	1	2.6
Shortness of breath	4	10.3
Hypoxia	1	2.6
Sweating	1	2.6
Anosmia	1	2.6
Ageusia	1	2.6
Habits of life		
Ex-smoker	5	12.8%
Not informed	34	87.2%
Image		
Unspecified radiologic findings	10	25.6
Bilateral Pneumonia	3	7.7
Ground glass opacity	5	12.8
Lymphadenopathy	1	2.6
Crazy paving	1	2.6
Not informed	19	48.7
Status of the disease		
Mild	3	7.7
Moderate	1	2.6
Severe/not serious	3	7.7
Serious (critical)	2	5.1
Not informed	30	76.9

to be continued

Table 2. continuation

Variable	N	%
Treatment		
Antibiotic	3	7.7
Antiviral	1	2.6
Oxygen therapy	2	5.1
Mechanic ventilation	1	2.6
Traditional Chinese medicine	1	2.6
Not informed	31	79.5
Outcome		
Death	6	15.4
Cure/discharge	4	10.2
Remains hospitalized	2	5.1
Not informed	27	69.3

between imaging tests and polymerase chain reaction (PCR) that were negative[6]. Furthermore, the literature evidenced that similarities can exist among the radiologic changes caused by COVID-19 and those motivated by the cancer itself, in special lung cancer[8,9].

The same can happen with other signs/symptoms, most of all with those related to the respiratory system and fever. In individuals with lung cancer, for example, clinical complaints associated to this system are predominant. An additional challenge for the physicians is to establish the relation between the complaints presented and the probable cause. This aspect reveals the necessity of clinical guidelines that can guide the professionals in the management of these patients.

In addition to the damaging effects of the pandemic for oncologic patients, it is necessary to highlight that, in the attempt to contain the dissemination of the virus, the clinical activities were reduced. This conduct, together with social isolation, can cause in the long time the reduction of the rate of cancers diagnosis in earlier stages. In the future, the late diagnosis can impact the survival of these new diagnosis[10]. According to an analysis conducted in England, it is anticipated an accrual of 6,270 deaths (20% raise) in the upcoming 12 months in patients with new diagnosis of cancer because of the pandemic[15].

The reduced number of investigations about the theme and the small population studied are limitations of this study. This scenario hinders the definition of a clinical profile of the oncologic patients infected by Sars-CoV-2 and the identification of subgroups with major risk.

CONCLUSION

The proper care to this special group of patients when infected by the novel coronavirus is essential to achieve

better outcomes. In this study, the profile was characterized by the predominance of males, lung cancer and respiratory symptoms. Still, high lethality was observed.

Substantial efforts are been made to better understand the particularities of patients with cancer infected by the novel coronavirus. The paucity of investigations about the effects of the virus in individuals with cancer and the small population included demonstrate the urgent necessity of new scientific investigations targeted to this public.

CONTRIBUTIONS

All the authors contributed substantially for the conception and planning of the study, gathering, analysis and interpretation of the data, wording, critical review and approval of the final version to be published.

DECLARATION OF CONFLICT OF INTERESTS

There is no conflict of interests to declare.

FUNDING SOURCES

None.

REFERENCES

1. Hui DS, I. Azhar E, Madani TA, et al. The continuing 2019-nCoV epidemic threat of novel coronaviruses to global health - The latest 2019 novel coronavirus outbreak in Wuhan, China. Int J Infect Dis. 2020;91:264-66. doi: https://doi.org/10.1016/j.ijid.2020.01.009
2. Organização Pan-Americana da Saúde (BR). Brasília, DF: OPAS; [data desconhecida]. Folha informativa – COVID-19 (doença causada pelo novo coronavírus); 2020 maio 25 [acesso 2020 maio 14]. Available from: https://www.paho.org/bra/index.php?option=com_content&view=article&id=6101:covid19&Itemid=875
3. World Health Organization. Coronavirus disease (COVID-19). Situation Report; 114. Geneva: WHO; 2020 May 13 [cited 2020 May 14]. Available from: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200513-covid-19-sitrep-114.pdf?sfvrsn=17ebbbe_4
4. Liang W, Guan W, Chen R, et al. Cancer patients in SARS-CoV-2 infection: a nationwide analysis in China. Lancet Oncol. 2020;21(3):335-7. doi: https://doi.org/10.1016/S1470-2045(20)30096-6
5. Sica A, Massarotti M. Myeloid suppressor cells in cancer and autoimmunity. J Autoimmun. 2017;85:117-25. doi: https://doi.org/10.1016/j.jaut.2017.07.010
6. Moujaess E, Kourie HR, Ghosn M. Cancer patients and research during COVID-19 pandemic: a systematic review of current evidence. Crit Rev Oncol Hematol. 2020 Apr 22;150:102972. doi: https://doi.org/10.1016/j.critrevonc.2020.102972
7. Leonetti A, Facchinetti F, Zielli T, et al. COVID-19 in lung cancer patients receiving ALK/ROS1 inhibitors. Eur J Cancer. 2020 Jun;132:122-4. doi: https://doi.org/10.1016/j.ejca.2020.04.004
8. Tian S, Hu W, Niu L, et al. Pulmonary pathology of early-phase 2019 novel coronavirus (covid-19) pneumonia in two patients with lung cancer. J Thorac Oncol. 2020;15(5):700-4. doi: https://doi.org/10.1016/j.jtho.2020.02.010
9. Qu J, Yang R, Song L, et al. Atypical lung feature on chest CT in a lung adenocarcinoma cancer patient infected with COVID-19. Ann Oncol. 2020 Mar 9. doi: https://doi.org/10.1016/j.annonc.2020.03.001 Epub ahead of print. PubMed PMID: 32165205.
10. Salako O, Okunade K, Allsop M, et al. Upheaval in cancer care during the COVID-19 outbreak. Ecancermedicalscience. 2020 Apr 1;14:ed97. doi: https://doi.org/10.3332/ecancer.2020.ed97
11. Yu J, Ouyang W, Chua MLK, et al. SARS-CoV-2 Transmission in patients with cancer at a tertiary care hospital in Wuhan, China. JAMA Oncol. 2020 Mar 25;e200980. doi: https://doi.org/10.1001/jamaoncol.2020.0980
12. Zhang H, Xie C, Huang Y. Treatment and outcome of a patient with lung cancer infected with severe acute respiratory syndrome Coronavirus-2. J Thorac Oncol. 2020 May;15(5):e63-e64. doi: https://doi.org/10.1016/j.jtho.2020.02.025
13. Ouyang W, Yu J, Zhang J, et al. Alert to potential contagiousness: a case of lung cancer with asymptomatic SARS-CoV-2 infection. J Thorac Oncol. 2020 Apr;S1556-0864(20)30300-2. doi: https://doi.org/10.1016/j.jtho.2020.04.005 Epub ahead of print. PubMed PMID: 32305592.
14. Suppli MH, de Blanck SR, Elgaard T, et al. Early appearance of coronavirus disease 2019 associated pulmonary infiltrates during daily radiotherapy imaging for lung cancer. J Thorac Oncol. 2020 Apr;S1556-0864(20)30299-9. doi: https://doi.org/10.1016/j.jtho.2020.04.004 Epub ahead of print. PubMed PMID: 32283316.
15. Banerjee A, Pasea L, Harris S, et al. Estimating excess 1-year mortality from COVID-19 according to underlying conditions and age in England: a rapid analysis using NHS health records in 3.8 million adults. MedRxiv. 2020 Mar 24. doi: https://doi.org/10.1101/2020.03.22.20040287

Recebido em 18/5/2020
Aprovado em 20/5/2020