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Characteristics and treatment of the oncological patient in the midst of the current COVID-19 pandemic

Características y tratamiento del paciente oncológico en el marco de la actual pandemia de la COVID-19

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ABSTRACT

Introduction: Cancer is one of the main causes of death around the globe. Several reports indicate how dangerous COVID-19 can be for oncological patients.

Objective: To characterize the treatment of the oncological patient in the midst of the COVID-19 pandemic.

Methods: A bibliographical review was carried out using 37 bibliographical references in Spanish and English. Pubmed/Medline, ScIELO, Scopus,

and ScienceDirect databases were used for the search. Other official sources such as WHO and CDC were also used.

Development: Oncological patients have a compromised immune system. Polypnea was more common in oncological patients with COVID-19 than in cancer-free patients. There were no differences with regard to other symptoms; however, more severe lesions were observed in CT-Scans. Preventive measures must be reinforced in these patients and both chemotherapy and surgical treatment should be delayed as long as possible although its implicit risk must be considered. All patients with cancer must be classified as high risk patients and those infected with SARS-CoV-2 should receive the same treatment than the non- oncological patients.

Conclusions: Oncological patients have higher risk of suffering from severe forms of COVID-19 than the general population; therefore, it is very important to take appropriate preventive measures that are not against the administration of an adequate oncological treatment. Because of that, it is necessary to adapt previously established protocols to the current situation the world is living at present.

Keywords: Cancer, oncological disease, coronavirus, COVID-19, SARS-CoV-2.

RESUMEN

Introducción: El cáncer constituye una de las principales causas de morbimortalidad en todo el mundo. Múltiples reportes indican lo peligroso que puede llegar a ser la COVID-19 en pacientes oncológicos.

Objetivo: Caracterizar al paciente oncológico y su tratamiento en el marco de la actual pandemia de COVID-19.

Material y Métodos: Se realizó una revisión bibliográfica para la cual se usaron 37 referencias bibliográficas en inglés y español para la cual se utilizó *Pubmed/Medline, ScIELO, Scopus, ScienceDirect,* así como fuentes oficiales como OMS y CDC.

Desarrollo: Los pacientes oncológicos presentan un sistema inmune comprometido. La polipnea se presentó más en pacientes con cáncer con diagnóstico de la COVID-19 que en aquellos sin antecedentes oncológicos. No se hallaron diferencias en relación con otros síntomas; sin embargo, se detectaron lesiones de mayor severidad en la Tomografía Axial Computarizada. En estos pacientes deben reforzarse medidas preventivas y se plantea la posibilidad de retrasar los tratamientos quimioterapéutico y quirúrgico mientras sea posible, aunque debe tenerse en cuenta el riesgo que esto constituye. Todos los pacientes con cáncer deben clasificarse como de alto riesgo y los que contraigan el SARS-CoV-2, recibirán el mismo tratamiento que los pacientes no oncológicos.

Conclusiones: Los pacientes oncológicos tienen un mayor riesgo que la población general de padecer formas graves de la COVID-19; de ahí que sea importante adoptar medidas preventivas adecuadas que no se opongan a la aplicación de un tratamiento oncológicamente adecuado; por tanto, se hace necesario adaptar los esquemas

previamente establecidos a la situación que vive el mundo actualmente.

Palabras claves: Cáncer, enfermedad oncológica, Coronavirus, COVID-19, SARS-CoV-2.

INTRODUCTION

Coronaviruses (CoVs) are single-stranded positive-sense RNA viruses isolated for the first time in chickens in 1937; however, it was not until 1966 when Tyrell and Byone managed to successfully cultivate the virus from samples taken from human patients with common cold.[1] These viruses have spherical shape with protein projections emerging from their surface resembling a solar crown, hence its name.[2,3]

CoVs belong to the Coronaviridae family that has two sub-families, Coronavirinae and Orthocoronavirinae, the last of which has four genres: Alphacoronavirus, betacoronavirus, deltacoronavirus and gammacoronavirus. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which was identified by the International Committee on Taxonomy of Viruses as the causing agent of the current pandemic, was classified as a betacoronavirus belonging to the sarbecovirus sub-genre.[4,5,6,7] The disease caused by SARS-CoV-2 was officially named by the World Health Organization (WHO) as coronavirus disease 2019 (COVID-19).[8]

The current outbreak is the third in just two decades in which an animal coronavirus becomes harmful to humans, affecting a great number of people and causing low respiratory tract infections.[6] It began on December 2019 when a group of patients were diagnosed with pneumonia of unknown origin in Wuhan city, Hubei province, China. The first patient was diagnosed on December 12 and, after ruling out other possible etiological agents, it was concluded that the causing agent was a new coronavirus[4,5,9] which was identified by Chinese authorities on January 7, 2020.[9,10] On March 11, the WHO declared COVID-19 a pandemic.[11] To this date, 188 countries have reported cases around the world. A total of 4 426 937 cases have been confirmed and 301 370 have died, for a mortality rate of 6,8%. [12] In Cuba, the first case was reported on March 1. The information presented in this report comes from the data reported by the health authorities of the country,[13] confirmed by the WHO two days later.[14] Until now, a total of 1830 cases and 79 deaths have been reported.[15]

Cancer is a generic term used to designate a large group of diseases that can affect any part of the body. Among its defining characteristics it is important to mention the rapid and unorganized cell growth that causes the formation of tumors and malignant neoplasms and the capacity to invade other parts of the body, either by contiguity or metastasis.[16,17] Cancer is one of the main causes of morbidity and mortality worldwide[18] and, in Cuba, it is the second cause of death.[19]

The care of cancer patients demands a lot of medical resources that frequently coincide with those needed for the care of COVID-19 patients, which is a great challenge for the medical staff. Multiple reports indicate how dangerous COVID-19 can be for cancer patients; therefore, the

potential risk of contracting the disease must be considered and compared to the risks of withholding cancer treatment. At the same time, the alleviation of the possible consequences of treatment irregularities associated with social isolation and quarantine is vitally important.[20]

Cancer is one of the diseases responsible for more deaths worldwide every year; therefore, it is undeniably one of the main health problems that mankind faces. COVID-19, with its fast spreading, has affected one way or another every aspect of daily life and, for cancer patients, the risk is even greater. To maintain a good cancer care in the midst of the current pandemic has been a great challenge for health authorities globally; so the following **objective** is proposed to characterize the treatment of the oncological patient in the midst of the COVID-19 pandemic.

MATERIAL AND METHODS

A bibliographic review was made during the period between April, 25 and May 14, 2020.

Pubmed/Medline, SciELO, Scopus and ScienceDirect databases were used for the search using Google Scholar search engine. Other official sources such as the World Health Organization and the Center for Disease Control and prevention were also used.

The most up-to-date and novel bibliographies in both English and Spanish were considered as selection criteria. Of a total of 45 selected references, 2 were excluded because they had no direct relationship with the objective of the work and other 6 were not selected because only the abstracts were available, leaving a total of 37 bibliographic references.

Search strategies were applied using the following keywords: *cancer, oncological disease, coronavirus, COVID-19, SARS-CoV-2*.

DEVELOPMENT

Cancer patients are generally characterized by advanced age, patients suffering from chronic diseases and having a compromised immune system, either because of the disease itself or because of its treatment, which makes them more susceptible to infections.[18,21,22] In addition, the need to visit the hospital more frequently and the possible previous history of a surgical intervention makes the risk of contracting COVID-19 greater.

A study performed by Liang W.et al. in China reported that polypnea appeared more commonly in cancer patients than in those with no history of oncological disease, which could be related to the fact that a great number of patients in that study suffered from lung cancer, which, in turn, could be related to the smoking habit that usually aggravates that symptom.[22] Besides, patients with lung cancer tend to have a compromised respiratory function associated with symptoms like cough, dyspnea and polypnea.[23] No differences were reported in other related symptoms or chest X-Ray findings compared to non-oncological patients; however, more severe lesions were found in other imaging studies like the Computed Tomography (CT-

Scan). Also, these patients had a higher risk to be rapidly progressing to more severe forms of the disease, so they required admission to the Intensive Care Unit (ICU) and mechanical ventilation more commonly, with a higher level of fatal outcome.[22] Other studies such as the one conducted by Yu et al. report a higher risk of contagion associated with greater contact with the hospital environment; however, they do not report a greater severity of the symptoms as compared to non-cancer patients.[24] The way the treatment of cancer patients is organized during the pandemic is crucial. Towards that goal, many countries such as Italy, India, the United States of America, Spain, and China among others have modified their treatment guidelines.[18,25,26,27,28] Regarding prevention, which so far constitutes the fundamental pillar in the treatment of COVID-19, the decision to postpone visits to hospitals for those patients that are not following specific treatments and to apply telemedicine as an alternative for their management has been taken. Other measures should also be taken by the general population such as hand washing; use of sanitary masks especially when suffering from respiratory symptoms; coughing in the flexion of the elbow or in a tissue that must be discarded after use; avoiding touching the eyes, nose and mouth; and maintaining interpersonal distance of at least 1 meter.[7,29,30] Hand washing must be frequent and should be done with soap and water, preferably hot and for no less than 20 seconds; if soap and water are not available, a 60% hydroalcoholic solution or a similar solution at higher concentration must be used; however, if hands are visibly dirty, the use of soap and water is preferred.[7] Regarding the use of sanitary masks, the FFP2 and FFP3 ones are preferred over the regular cloth mask since the latter is less effective, although it constitutes an alternative.[31] Regarding patients that have already started treatment with chemotherapy and those that have already made appointments to begin this kind of treatment, the possibility of treatment delay has been raised.[18,25] There is no data to support the change or delay of chemotherapeutic treatment, targeted therapy and/or immunotherapy; so, individualized evaluation of each patient is advised. In some cases, the change from intravenous cytostatic drugs to an oral drug, can be assessed.[32] In the case of patients in remission under follow-up, visits to hospitals must be reduced[25] and radiotherapy should be postponed in those patients that are awaiting or receiving this kind of treatment, unless it constitutes an adjuvant treatment prior to surgery that cannot be postponed due to the stage of the disease.[32] In those patients for whom treatment cannot be postponed, whether they live or not in endemic areas, their accessibility to the institutions designed for their care must be guaranteed. In Lombardy, epicenter of the COVID-19 pandemic in Italy, four Cancer Centers were chosen to attend all patients who were referred to receive chemotherapy, biological therapy and immunotherapy. In those centers, control areas were established for the early detection of potentially infected patients.[25] In India, due to isolation and other preventive measures taken in the country, not only patients' access but also the access of the medical staff to hospitals was

affected, diminishing availability. Because of that, the hard decision of prioritizing those patients receiving curative treatment over those receiving palliative care had to be made.[27]

Oncological surgery currently poses a risk, not only because of the severity of the disease itself, but also because of the lack of medical supplies, health personnel and the low ICU beds availability. Several measures related to the performance of surgical procedures during the pandemic have been recommended for those patients suspected of having the disease. They should wait for the results of the diagnostic test for COVID-19, being the real-time polymerase chain reaction (RT-PCR) from oropharyngeal and sputum samples the most used one.[2,33] In places where this test is not available or in the case urgent surgery should be performed, a preoperative CT-Scan must be planned and maximum protective measures aimed to prevent the potential contagion of the surgical team must be taken; prophylactic and risk reducing procedures as well as surgery for benign diseases must not be performed. The American Society of Oncology proposed a series of changes according to the type of oncological surgery to be performed.[34] All elective surgeries that do not directly affect the evolution of the patient must be postponed; however, this decision should be taken by a team that includes both the oncologist and the surgeon, evaluating the particularities of each patient.[28] The stage of the pandemic will be taken into consideration in decision-making for surgery. In breast cancer-related surgery like patients with atypia, benign lesions and patients needing risk-reducing surgery or reconstructive surgery, surgical procedures should be delayed for at least three months; however, in patients that have already received neoadjuvant therapy, surgery should be delayed for as long as possible taking into account a 2-to-8 window period. In the case of thoracic tumors, surgery must be limited to those patients that will not survive during the next three months due to the characteristics of the disease in some cases like lung cancer patients with positive lymph nodes and patients with symptomatic mediastinal tumors, among others. Other entities such as solitary lung nodule or lung tumors smaller than 2 cm in diameter, thymomas, and others may also be recommended for surgery. Regarding head and neck and neuroendocrine tumors, most of the non- complicated surgeries can be postponed; however, some thyroid tumors that threaten life because of their histological type, rapid growth, local invasion or recurrence, can be treated as urgencies. In general, in tumors of the digestive tract, a preoperative waiting time of six months does not affect the total survival of patients with early gastric cancer; whereas in patients with stage II and III, the waiting time should be less than three months. Surgery should be performed in patients with aggressive hepato-pancreatico-biliary cancer, as it was indicated before the pandemic. Most patients with colorectal cancer must undergo surgery during the early stages of the pandemic (stage I), foreseeing the possibility of a future saturation of the health systems.[28,34]

The European Society of Surgical Oncology (ESSO) recommends patients older than 70 years to avoid, if possible, visits to hospitals and medical

centers. The American Society for Transplantation and Cellular Therapy and the European Society of Blood and Marrow Transplantation have reported the implications that travel restrictions enforced by the European continent will have on transplant therapy.[35]

During the pandemic, all cancer patients will be classified as either risk patients or confirmed COVID-19 patients.[22] Once diagnosed, it is recommended to stop the oncological treatment and to treat the infection as established in the WHO and the CDC guidelines.[36,37]

Some measures such as isolation, quarantine, limitation of visits from family and friends compromise the support given to cancer patients. In addition, many patients and their families will be aware of the risk of contracting SARS-CoV-2 and the way it would affect the evolution of their disease. As a result, the work of a trained personnel that provides psychological support to these patients and their families is of paramount importance for hospitals and medical centers

CONCLUSIONS

Cancer patients generally have a compromised immune system, either because of the disease itself or its treatment, which makes them more susceptible to infections. This means that, at present, special attention must be paid to cancer patients due to the danger that COVID-19 represents for them and the greater risk they have of developing more severe forms of the disease. Preventive measures must be strictly taken and, if possible, oncological treatments such as chemotherapy, radiotherapy, immunotherapy and even surgery, must be modified or postponed. Given the difficult epidemiological situation the world is currently facing, the implementation of adequate preventive measures that do not compete against the application of an appropriate oncological therapy is of vital importance; therefore, it is necessary to adapt the previously established therapeutic schemes to the current situation of the world.

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Conflict of interests

No conflicts of interests were reported.

Authors´ contribution

Both authors contributed equally to the confection of this article. All the authors participated in the bibliographical research, the confection of the written report, and the final revision of the article. All of them approved the final version of the written work.