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Situation of oncological patients during COVID-19 pandemic with particular emphasis on lung cancer patients

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SUMMARY

Introduction and purpose: The purpose of this study is to review literature about alterations to treatment regimens to lung cancer during COVID-19 pandemic accessible on PubMed platform. In pulmonary neoplasms, early diagnosis and treatment is a key to ensure patient safety. Burdening of healthcare systems during pandemic has resulted in many obstacles in oncologic treatment.

A brief description of the state of knowledge: The lung cancer is the most frequent and the most deadly cancer in men and women. COVID-19 is a pulmonary infectious disease whose spread around the world has resulted in a pandemic. At the onset of the worldwide pandemic, many institutions, including healthcare facilities were closed, making it more difficult to provide oncological patients the treatment compliant with the standards. The anxiety of patients caused by the pandemic has caused delays in treatment that can cause progression of the disease. In patients with lung cancer mortality of COVID-19 was around 50%, which made their visits at hospital hazardous. Before the accessibility of anti-COVID-19 vaccines telemedical healthcare was one of the ways to provide healthcare to oncological patients.

Conclusions: Patients with lung cancer are one of the risk groups of COVID-19. Delays in their treatment caused by the pandemic are potentially dangerous and negatively affect the therapy. Telemedicine is a useful too provide medical care, but has its own limitations.

Key words: COVID-19; Telemedicine; Lung cancer; pandemic

INTRODUCTION

COVID-19 pandemic has taken many lives and overburdened healthcare systems. Its consequences are, among other things, limited access to physicians and lowered frequency of patients' visits at healthcare facilities [1-3]. One of the most endangered groups are oncological patients, whose treatment has to be delayed in case of SARS-CoV-2 infection [4,5]. Lung cancer is the most frequent cancer worldwide, being also the most fatal in both men and women [6]. Delay in diagnosis often results in progression of the disease and worse prognosis, lowering the expected survival time of the patients [7].

ISOLATION OF ONCOLOGICAL PATIENTS

World Health Organization (WHO), European Society for Medical Oncology (ESMO) and National Health Service (NHS) point to the role of isolation as an important measure to ensure the safety of risk groups [8-10]. Unfortunately, isolation has an impact on mental health of the patients, especially those who need third parties for their daily functioning. Isolation makes their levels of anxiety, loneliness and guilt rise [11-13]. These factors have a negative impact on their immunity, which decreases with a load of mental burden [14].

COVID-19 EPIDEMIOLOGY

From November 2019 to September 2021 almost 228 million cases of COVID-19 were diagnosed, 4,68 million of them being fatal [15]. Acute Respiratory Distress Syndrome is the reason of 80% of COVID-related deaths [16]. Severe cause of the disease is associated with fast viral replication and delayed interferon production and intense infiltration of inflammatory cells [17].

ONCOLOGICAL PATIENTS AS THE GROUP OF RISK

The risk of contracting the SARS-CoV-2 virus is three times higher in oncological patients. Risk of severe cause of the disease is also significantly higher. Exacerbation of the disease happens after a shorter time in them, and severity of the disease often need hospitalisation, respirator therapy and higher mortality. The course of the disease is the most severe in haematological tumours and lung tumours [18-22].

RISK FACTORS IN ONCOLOGICAL PATIENTS

Among the most important risk factors for COVID-19 contraction for oncological patients are: frequent contact with other people during hospitalisation, diagnostics and treatment, lowered immunity caused by neoplastic process, chemotherapy or bone marrow metastases [19, 23]. Additional diseases, for example diabetes, cardiovascular and pulmonary diseases, elderly age and medical procedures (surgeries, transplants, chemotherapy, bronchoscopy etc.) increase the risk of contracting SARS-CoV-2 [19,24].

TELEMEDICINE AND OTHER ALTERATIONS TO TREATMENT

Telemedicine is a term made to name performing medical procedures by means of distance communication. During COVID-19 pandemic it has become an important mean to provide medical care without the risk of virus transmission. It lowers costs of medical care, personal protective equipment and helps to save time of patients and physicians.

On the other hand, it increases the risk of confidential data leak, arouses distrust to healthcare and is impossible to perform without proper technical equipment. During telemedical visit, performing physical examination is impossible, which results in risk of improper diagnosis and lowered disease detectability. That may result in delayed diagnosis and treatment of a neoplastic lesion, resulting in worse prognosis for the patient. To improve telemedical treatment, technological innovations and education of the society, especially elderly people, are needed [12, 25-30]. Other implemented alterations to therapy were chemotherapy delay and less frequent radiotherapy in higher doses. Unfortunately, all alterations to treatment regimens bring the risk of disease progression and incorrect drugs dosage. They key factor in therapy during COVID-19 pandemic is individual care for every patient, treatment delay based on medical evidence and care for mental health of patients [31].

SARS-CoV-2 INFECTION IN LUNG CANCER PATIENTS

The lung cancer is a factor that increases the risk of severe course or death as a result of COVID-19 infection. According to research carried out in Spain, each lung cancer patients consecutively diagnosed with COVID-19 had symptoms of an infection and 74% of them required hospitalization. Time from symptoms onset to first positive SARS-CoV-2 PCR was 5,5 days. Among the most common symptoms occurred: cough (48%), shortness of breath (48%), fever (39%) or low-grade fever (30%). 39% of patients developed acute respiratory distress syndrome (ARDS). There was a high variability on thoracic imaging findings, with multilobar pneumonia as the most commonly found pattern (74%). Main abnormalities in laboratory results were low lymphocytes count (87%), high neutrophil to lymphocyte ratio -NLR- (78%) and elevated inflammatory markers: fibrinogen (91%), c-reactive protein -CRP- (87%), and D-dimer (70%) [32].

LUNG CANCER MANAGEMENT DURING PANDEMIC

Lung cancer number of cases and deaths is still rising, making it the most frequent cancer and cause of cancer death in man and women combined. According to GLOBOCAN data, in 2018 there was 2,09 million new cases and 1,76 million of deaths caused by lung cancer. In lung cancer, early diagnosis increases patients' survivability, and that's the reason of great importance of screening programmes. The COVID-19 pandemic is a time when healthcare systems are overburdened, resulting in delays in cancer screening [33,34]. Cancer Research UK estimates that in first 10 weeks of lockdown have resulted in 2,1 million delayed cancer seeking investigations. Even the early report from China and Italy have indicated higher susceptibility and mortality of cancer patients to COVID-19. That brings forward the challenge, to balance the need to screen patients for potential cancer and to protect them from potentially dangerous COVID infection [35,36]. The risk of infection can be greatly reduced trough anti-COVID-19 vaccination. Considering that in cancer patients' severe course incidence and COVID-19 mortality are higher, their vaccination is of high priority [37]. Pandemic has also influenced lung cancer therapy scheduling. During COVID-19 pandemic anxiety of oncologic patients has grown and often resulted in requested therapy delays. With the delays in therapy, the risk of tumour progression rises and threatens the life safety of patients [38,39].

The outbreak of COVID-19 pandemic (February-April 2020) has resulted in decrease in cancer notifications in many European countries. Data from Slovenia show also 19%, 43% and 20% decrease in outpatients visits respectively in radiotherapy, surgery and medical oncology sectors of Institute of Oncology in Ljubljana. Data from USA show 47% decrease of oncological outpatients visits in April 2020 [40].
Even without mentioning organisational problems that oncological healthcare had to stand up against, COVID -19 is a great danger to patients with lung cancer. Data from Hospital Universitario Infanta Leonor of Madrid show even 52,3% COVID mortality of lung cancer patients compared to 192 deaths over the total of 1878 COVID-19 patients in that centre. Lung cancer is a negative prognostic factor for COVID-19 infection because of lowered lung capacity, pulmonary vascular compromise, or interstitial or parenchymal damage related to cancer and prior treatments. In New York, mortality of cancer patients from COVID-19 was estimated on level of 28%. Mortality of lung cancer patients has reached 55% in the same study [41,42,43].

CONCLUSIONS

During COVID-19 pandemic treatment of pulmonary neoplasms was hindered by severe cause of the disease in oncological patients and logistical problems caused be protecting the patients with social distancing. Improving the telemedical healthcare system and anti-COVID-vaccination seem to be a proper way to increase the quality of treatment and prevent situations in which patients fear to continue the treatment.

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