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Management strategy for cancer patients in the context of the COVID-19 epidemic



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ABSTRACT

Coronavirus infection 2019 (COVID-19) has emerged a very dangerous infectious disease that occurs as an acute respiratory viral infection with complications, including pneumonia with acute respiratory distress syndrome or respiratory failure with a risk of death. As already confirmed, COVID-19 is caused by the new severe acute respiratory syndrome-2 coronavirus (SARS-CoV-2). We describe our strategy for the management of cancer patients based on the experience of the medical staff of the Regional Clinical Oncology Center of the Republic of Bashkortostan. We hope this can serve as a guide for oncologists to provide emergency care in the context of the COVID-19 epidemic.

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Introduction

The etiological agent coronavirus infection 2019 (COVID-19) confirmed a new coronavirus, now known as the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which most likely arose from zoonotic coronaviruses, such as SARS-CoV, which appeared in 2002 [1,2].

Due to the specificity of oncologic diseases, it can happen that the course of the disease itself can be very difficult, in particular, accompanied by high fever [3]. Therefore, an important question arises that requires an urgent solution: how to standardize and reasonably plan the process of providing emergency medical care to patients with cancer in order to diagnose COVID-19 in time, but also to be able to discriminate patients who have fever from an infection from those whose fever is due to their underlying cancer and its treatment. While in the vast majority of patients with a diagnosis of cancer, COVID-19 proceeds as an otherwise uncomplicated acute respiratory disease, it can also proceed with serious

complications due to immunosuppression and the associated cancer treatments [4].

At the Regional Clinical Oncology Center (RCOC) of the Republic of Bashkortostan, the at-risk group for COVID-19 includes 86,847 patients who are registered with a diagnosis of a malignant neoplasm. The majority of these patients registered with a diagnosis of cancer are in remission, and undergoing regular examinations in order not to miss a relapse. In 2019,

14,008 patients were diagnosed with malignant neoplasm for a first time, and most of them are in active phases of treatment, receiving therapy as either outpatients or in the hospital.

To continuously treat and monitor cancer patients and reduce the risk of COVID-19 infection, new temporary protocols for patient admission to the clinic and planned hospitalization have been introduced. The procedure for admitting employees to work has also been defined taking into account the reduction in the risk of mass infection. We describe here how work has been organized according to temporary guidelines in the context of the COVID-19 pandemic.

All individuals entering the RCOC must pass through 1 of 3 entrances where temperatures are measured and hands are processed. Access for visitors and those who provide care is also limited, with all transfers organized through the help desk. Any patient or employee with a temperature above 37°C is not allowed to

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proceed further in order to limit the risks of infection to personnel and all those present in the RCOC building. Those with a temperature are advised to isolate themselves and call their local general practitioner at the place of residence by telephone. RCOC employees who develop symptoms of SARS are not allowed to work. In these situations, self-isolation is recommended. In addition, structural divisions result in 2-fold thermometry at the beginning and at the end of the work day with data entered into observation sheets. In RCOC, there are 5 branches where chemotherapy is administered. In the branches, the antiepidemic measures summarized above are also enforced to prevent the spread of coronavirus infection. When patients contact the RCOC, they undergo an examination at the entrance. The medical staff of the RCOC were trained for work with coronavirus infection, and a stock of necessary supplies was ensured. All medical personnel have been trained to work with patients to identify COVID-19. All RCOC employees have been provided level 1 personal protective equipment (PPE).

Upon admission, all patients undergo a thorough epidemiological history to identify any clinical history of an acute respiratory viral infection and pneumonia, with clarification of the fact of contact with the sick person, full information about contact persons, and body temperature. In the departments of the hospital, thermometry, the collection of an epidemiological history, and a thorough examination of the patient for acute respiratory viral infections are also duplicated. When patients are identified in the inpatient departments with signs of hyperthermia and other symptoms of acute respiratory viral infections, computed tomography of the chest is performed. The department stops working on admission and discharge of patients and all entrances and exits are blocked. If radiological signs of viral pneumonia are detected, the patient is transferred by ambulance to the COVID-hospital in Ufa. An emergency notification of the detection of an infectious disease is transmitted to the Center for Hygiene and Epidemiology and an epidemiological number is assigned to this case. Any patient who may have had contact with the patient with a presumptive diagnosis of COVID in the absence of contraindications, are discharged for self-isolation for 14 days under the supervision of a local therapist at the place of residence, or transferred to isolation in the re-profiled department of the RCOC. As a rule, patients in their early postoperative periods are transferred to this department where they benefit from the supervision of specialists. In this department, patients in their early postoperative period are observed by medical personnel outfitted with very high-risk level COVID-19 PPE (occupational safety and health administration [OSHA]) and continue treatment until recovery from their surgery. After recovery, these patients are discharged again with recommendations for self-isolation for 14 days under the supervision of a doctor. All patient contacts and employees undergo COVID-19 flushing from the nasopharynx and oropharynx. The samples undergo testing using a polymerase chain reaction (PCR)-based assay in the clinical diagnostic laboratory of the RCOC to detect COVID-19 RNA. In the computed tomography suite, disinfection is performed after each examination. In the department where the patient with viral pneumonia was identified, a final disinfection is carried out by the employees of the Republican Disinfection Station after the patient has been transferred to the temporary detention center. After completion of antiepidemiological measures and any needed interventions, the department resumes work on receiving and treating patients.

The redesigned department for those identified as potential contact patients is organized into 30 beds, with an isolated stay of patients from other units of RCOC. A clean zone for medical personnel, a gateway, and a conditional red zone for patients have been organized. The work of medical personnel with patients is carried out under conditions of conditional infection with a coronavirus. The staff is equipped with high-risk level COVID-19 PPE

(OSHA) protective equipment. The unit's ventilation is also isolated from the general hospital network. In addition to basic parameters including pulse, blood pressure, respiratory rate, and temperature measured by thermometry, patients undergo 2 independent measurements of blood oxygen saturation. If there is a suspicion of viral pneumonia, a computerized tomography (CT) scan of the chest is performed. If the postoperative course has been uncomplicated, the patient is immediately discharged from this department with instructions to have serial observation by the oncologist and therapist at the place of residence. After discharge from the department, individuals who may have had contact with patients with suspected coronavirus undergo continuous medical supervision for 14 days from the date of discharge after which time patients continue routine treatment.

RCOC employees, who have a history of contact with patients with coronavirus infection, are self-quarantined for 14 days with attention paid to the onset of symptoms of the disease. In the absence of symptoms of the disease, employees get to work. Employees who are monitored at home and develop symptoms of a disease that does not exclude coronavirus infection are sent to specialized medical institutions for isolation in a hospital setting.

All patients with suspected coronavirus infection and their contacts are managed in accordance with the letter of the Chief Sanitary Doctor of the Russian Federation N02/1866-2020-32 of 02/10/2020 titled "On sending supplements to temporary recommendations for organizing laboratory diagnosis of a new coronavirus infection (COVID-19)" and a sample of material is obtained for PCR studies. Patients with symptoms of an acute respiratory viral infection and an epidemiological history have a sample obtained for PCR analysis on the first day upon admission to a medical institution, with a negative result on the third day. A medical professional trained in the requirements and rules of biological safety when working and collecting material carries out the collection of biological samples from patients and their contacts. Samples are transported in accordance with the requirements of sanitary legislation in relation to microorganisms of the pathogenicity group II (SP 1.3.3118-13) "Safety of work with microorganisms of the I-II pathogenicity groups."

Case presentation

Patient V, born in 1964, was hospitalized for treatment of his cancer from April 05, 2020 to April 30, 2020 with an additional diagnosis of new coronavirus infection COVID-19 confirmed by PCR on April 20, 2020, with a moderate clinical course from the infection.

Complication: Respiratory failure 0-1. Bilateral polysegmental viral pneumonia.

Concomitant: Presented with an intracerebral neoplasm of the left frontal lobe of the brain with hypertensive hydrocephalic syndrome and underwent a craniotomy with partial removal of a brain tumor on April 05, 2020. A CT of the brain obtained on April 03, 2020, had demonstrated a lesion in the left frontal lobe of the brain. After an additional examination on April 05, 2020, under anesthesia, a surgical intervention was performed—osteoplastic trepanation of the skull in the left frontoparietal region with partial removal of the cystic tumor of the brain. The postoperative period proceeded without complications. A CT of the brain obtained on April 06, 2020 demonstrated removal of a left frontal lobe tumor. The pathologic diagnosis was of glioblastoma multiforme. On April 16, 2020, his body temperature increased to 38°C, and due to a suspicion of COVID-19, a smear was taken, and processed. CT of the chest on April 16, 2020 demonstrated a right-sided upper-lobe viral pneumonia. A CT of the chest on April 21, 2020 revealed a bilateral polysegmental pneumonia with bilateral pleurisy (lesion volume 13 points) (Fig. 1). CT of the chest

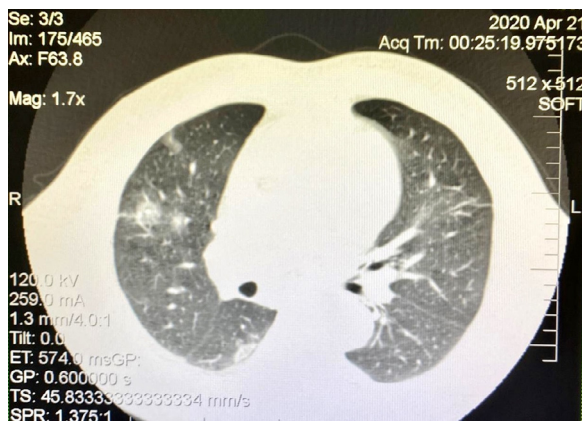


Fig. 1. CT of the chest from April 21, 2020 demonstrating bilateral polysegmental pneumonia. Bilateral pleurisy (lesion volume 13 points).

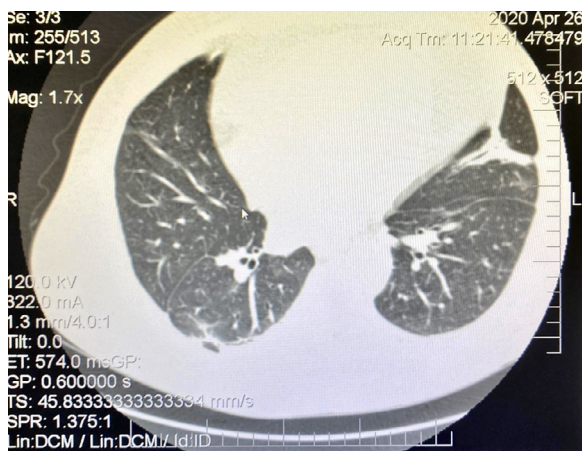


Fig. 2. CT of the chest from April 26, 2020 revealing bilateral polysegmental pneumonia. In comparison with the study obtained on April 21, 2020, there was an increase in the density of the infiltrative changes, without a visible increase in their volume.

on April 26, 2020 confirmed a bilateral polysegmental pneumonia that compared with the results of the study from April 21, 2020, demonstrated an increase in the density of infiltrative changes, without a visible increase in their volume (Fig. 2). Smears for COVID-19 RNA were positive on April 04, 2020 and April 21, 2020, negative on April 26, 2020, and again negative on April 29, 2020. Treatment administered included levofloxacin 500 mg 2 times a day, ambroxol 30 mg 3 times per day, paracetamol 100 mg intravenously for an increase in body to more than 38°C, enixum 0.4 mL subcutaneously 1 time per day, omez 20 mg 1 time per day, pancreatin 25,000 units 3 times a day, and neosmectin 3 times a day. His condition at discharge was satisfactory and he had no complaints, there was no cough nor shortness of breath, the temperature in the previous 7 days had been normal, pO₂ the last 4 days of hospitalization was 99%–100%. CT scan of the chest demonstrated marked improvement. Consent for outpatient treatment and self-isolation was obtained from the patient and he was discharged with improvement under the supervision of a therapist in a clinic at the place of residence.

Recommendations: Continue self-isolation mode for at least 14/35 days. Breathing exercises. CT scan of the chest after 1 month. Monitoring of general and biochemical analyses of blood for 2 weeks. Dehydration therapy courses while taking potassium preparations, and sedatives at night for 1 month. Continue antibiotic therapy with observation and treatment by an oncologist, and a neurologist at the clinic in the community.

Conclusions

The outbreak of the new coronavirus infection COVID-19, an emergency event that is defined as a public health hazard, poses serious problems (and challenges) to the medical system and the ability to respond to it for all countries of the world. In this article, we combined the experience of managing cancer patients during the COVID-19 epidemic. Understanding how COVID-19 is distributed and thanks to the efforts of doctors and other medical personnel, we believe that rational planning of the medical care process is necessary, which fully guarantees safe and effective work.

Human ethics

Consent was obtained by all participants in this study.

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None.

Conflicts of interest

Authors declare lack of the possible conflicts of interests.

Supplementary materials

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CRedit authorship contribution statement

Adel Izmailov: Writing - review & editing. **Ozal Beylerli:** Writing - original draft, Resources. **Valentin Pavlov:** Supervision, Project administration. **Ilgiz Gareev:** Investigation. **Maxim Zabelin:** Methodology, Conceptualization. **Rustem Ayupov:** Data curation. **Shamil Musin:** Validation. **Alexander Sultanbaev:** Visualization.

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