

The impact of COVID-19 pandemic on critical care and surgical services availability.



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ABSTRACT

The spreading of COVID-19 pandemic caused by the SARS-CoV-2 coronavirus affects the entire healthcare system in the world. As one of the side effects of the pandemic, the need for surgery deferral has emerged. The purpose of this analysis is to review current literature discussing the issue of a limited access to critical care and surgical services. Following the outbreak of a pandemic, many national scientific societies, as well as numerous medical specialty associations, have begun working on developing guidelines to deal with these issues to enable access to medical services for the most seriously ill patients affected by COVID-19. Moreover, limited access to intensive care beds, shortages in personal protective equipment chain supply and the risk of an unintended spread of infection among the staff and the patients led to a severe limitation of all elective operations, mostly excluding oncological, ur-gent/emergent and trauma interventions. This period of uncertainty about the risk of virus transmission can last for many months, if not years. Therefore, it is necessary to develop such behavioral patterns that will allow us to work safely without limiting the number of elective operations and maintaining continuous access to critical and surgical care. As elective operations were cancelled in the world to the extent that history did not witness so far, there is a simultaneous unintended harmful effect of this phenomenon. The overall survival time of patients may be shortened, their quality of life might be reduced, the risk of complications and the need for critical care in the most severe cases will increase. Currently, it seems of the utmost importance to develop a plan for a safe return to elective surgery. At the same time, international organizations should warrant the development of alternative plans for dealing with similar events in the future.

KEY WORDS: COVID-19, coronavirus, SARS-CoV-2, surgery, availability, delay, deferral.

INTRODUCTION

The spreading of COVID-19 pandemic caused by the SARS-CoV-2 coronavirus affects the entire healthcare system in the world [1] with over 5.22 millions infected, while the death toll has reached nearly 340 thousands casualties worldwide [2]. The level of impaired access to a healthcare availability is unprecedented in modern history [3]. As one of the side effects of the pandemic, there was a need for surgery deferral. The principal goal of these actions was to increase critical care resources in the event of a severe increase in the number of patients infected with SARS-CoV-2 [4]. Periodic restrictions on the access to surgical care have so far been observed only in the absence of medical personnel in a given area or temporary closures of medical facilities due to ongoing renovations or improvements [5]. Other causes of impaired access to surgical and critical care include, not a sudden decrease in services, but a rapid increase in the demand for these services. This is the case in armed conflicts, natural disasters or mass accidents with large number of casualties. However, in these situations it is usually a temporary phenomenon. Hence, the massive restriction of an access to a medical care that we are currently observing is a phenomenon against which modern medicine does not yet know appropriate solutions [6]. The purpose of this analysis is to present current literature discussing the issue of a limited access to critical care and surgical services.

METHODS

A review of the available literature discussing the impact of a pandemic on global access to medical services was made in the aspect of searching for solutions to increase the availability of services and an attempt to break the impasse of limited services.

GUIDELINES OF SCIENTIFIC SOCIETIES

Following the outbreak of a pandemic, many national scientific societies, as well as numerous medical specialty associations, have begun working on developing guidelines to deal with these issues to enable access to medical services for the most seriously ill patients affected by COVID-19 [7, 8]. There were several aspects to consider. It was necessary to ensure the availability of an adequate number of intensive care beds for patients. According to available reports, up to 20% of hospitalized patients may require a therapy in the intensive care units (ICU) [9]. At the same time, the number of ICU beds is even smaller in most facilities.

Hence, the need to create dedicated COVID-19 hospitals, as well as other departments were transformed into facilities for patients requiring mechanical ventilation. Unfortunately, these changes also affected the surgical wards, which had to postpone previously planned surgical operations. These recommendations regarding cancellation of elective operations appeared in almost all guidelines of scientific surgical societies [10]. An undoubted benefit of postponing elective surgery is the reduction in the number of patients requiring critical care for non-COVID-19 reasons [11]. Due to the unknown effect of COVID-19 on postoperative disorders related to the severity of inflammation, coagulopathy, etc., postponing surgery has the potential to reduce the number of complications in patients infected with SARS-CoV-2. In addition, the postponement of operations has an impact on saving the scarce resources of personal protective equipment (PPE), whose availability is severely limited in the early stages of the ongoing pandemic [12]. Anesthesia devices can temporarily take over the function of respirators, and the operating and postoperative rooms can be transformed into intensive care rooms. However, the available guidelines of various organizations around the world emphasize that only those elective operations should be postponed, which will not result in a significant worsening of patients' prognosis [13]. Oncological surgery should continue unless there are other alternative treatments modalities. There must be continuity in care for trauma patients, accidents and acute medical emergencies [14].

Reorganization of facilities

No health care system is prepared for the rapid increase in the number of patients requiring care in the event of sudden illness in most populations [15]. Hence, it was necessary to introduce social restrictions to flatten the disease curve in the area and enable hospitals to provide medical services to all those in need. Therefore, it is important to separate hospitals that take over full care of COVID-19 patients [16]. Other facilities should organize the infrastructure in such a way as to reduce the risk of personnel being infected. This can be done by proper reorganization of hospital departments with the division into three security zones [17]. Red zones are designated in which aerosol generating procedures are performed, such as intubation, laparoscopy, coagulation, endoscopy, tracheostomy, ventilation, nebulization, etc [18]. Red zones are also the area of residence of patients infected with SARS-CoV-2, where staff are exposed to airborne droplet and contact infection. Yellow zones, so-called transitional areas are areas where protective equipment is donned and doffed. Green zones are places considered safe, where there is no immediate threat, but basic protection

measures should be maintained, including social distancing, protective masks and proper hand hygiene. Similar changes should be made within individual departments, operating theaters, but also radiology units [15].

Surgical risk during the COVID-19 pandemic

Despite the typical clinical picture of SARS-CoV-2 infection in the form of symptoms of fever, dry cough and shortness of breath, we are still not able to quickly and definitively determine the current state of each patient [4]. The period of latency after exposure to the virus, associated with its incubation, the possibility of false negative results mean that surgery can be performed on a patient in whom we do not know about the currently ongoing infection [10]. In such a case, the use of improper protection measures may lead to the elimination of medical personnel from the health care system, and also threaten their health and life. In addition, the impact of the ongoing infection on the postoperative course in these patients was not fully understood [9]. This period of uncertainty about the risk of virus transmission can last for many months, if not years. Therefore, it is necessary to develop such behavioral patterns that will allow us to work safely without limiting the number of elective operations and maintaining continuous access to critical care. An inseparable element of such proceedings is working in designated areas and defining operating rooms for the treatment of COVID-19 patients. Such rooms should, above all, provide negative pressure in the room and contain only the necessary items, and all devices must be secured (e.g., covered with foil) [19].

Urgent, traumatic and critical care surgery

Patients admitted with symptoms of acute abdomen will not always be able to be diagnosed of SARS-CoV-2 infection prior to surgery. However, it is helpful to determine the likelihood of infection by computed tomography of the chest without contrast or lung sonography [20]. A typical finding is the image of a ground-glass in a radiological image. Such patients, although they do not have laboratory confirmation of the infection, must be treated as a high risk group for infection transmission [21]. Despite the pandemic, trauma patients are still being admitted. However, there are unconfirmed reports of a reduction in the number of these patients due to social restrictions, distancing, closure of many workplaces and significant transport restrictions. Unfortunately, these restrictions have also affected the reduction in the total number of blood donors during this period, which is extremely important for post-traumatic patients [22].

Plan for surgical and critical care after a pandemic

Cancellation of the vast number of planned operations creates a huge gap in access to medical services [23]. Long restrictions and lockdown mean that millions of operations are being cancelled worldwide or will not be performed at all [25]. In many regions of the world, access to surgical care is already considered insufficient and a pandemic is exacerbating this phenomenon [25]. For many years, the priority of health care systems in the world has been to improve access to anaesthesiological and surgical care [26]. Unfortunately, until we get new reliable data on the impact of COVID-19 on surgery, this condition must be maintained with all the limitations and safeguards against infection in surgery [27]. This means that the upcoming months may still look similar. There is still no data on the current risk of some potentially aerosol generating procedures [28]. Careful testing of the spread of the virus during these procedures is needed. Understanding these dependencies can allow for faster unlocking of the access to these procedures.

Restoring access to surgery and critical care

There is a lack of knowledge about the exact impact of limiting the availability of surgical services on patients' health, their daily functioning, adverse effects of diseases and prognosis. It is known, however, that cancelling surgery under normal circumstances causes disappointment, regret, stress, anger and sadness in patients [29]. These phenomena should also be taken into account when restoring access to surgical treatment. As elective operations were cancelled in the world to the extent that history did not witness so far, there is a simultaneous unintended harmful effect of this phenomenon. The overall survival time of patients may be shortened, their quality of life will be reduced, the risk of complications and the need for critical care in the most severe cases will increase.

CONCLUSIONS

In total, around 330 million operations are performed globally under normal conditions, resulting in a huge number of patients that will continue to look for means to save their health and life [30]. The COVID-19 pandemic has resulted in a severe reduction in the number of operations performed, and in many countries, it has even led to giving up all elective operations. Currently, it seems of the utmost importance to develop a plan for a safe return to elective surgery. At the same time, international organizations should warrant the development of alternative plans for dealing with similar events in the future.

Disclosure statement

The authors did not report any potential conflict of interest.

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