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ACHIEVEMENTS AND CHALLENGES OF MANAGEMENT OF COVID-19 PATIENTS AT MIKAELYAN UNIVERSITY HOSPITAL

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Abstract

More than two years since the first SARS-CoV-2 infection were reported, the COVID-19 pandemic remains an acute global emergency. The COVID-19 pandemic has deeply affected the lives of people across the world. Its health, economic, political, educational, and societal consequences have disproportionately affected the most vulnerable. Apart from being a global health concern, COVID-19 is having major consequences on the world economy. The pandemic has challenged local, national, regional and global capacities to prepare and respond. Health systems globally have employed three common approaches to rapidly scale up health system infrastructure, namely by constructing new treatment facilities, converting public venues and re-configuring existing medical facilities to provide care for patients with COVID-19. Considerable efforts were being made behind the scenes to develop new strategies to ensure adequate public healthcare infrastructure and workplace capacities. Hospitals have repurposed and reallocated internal space and redeployed resources to manage COVID-19 patients. Countries discharged many patients from hospitals to their homes and postponed non-critical treatment and elective procedures. Almost all hospitals adopted a strategy of hospital approach to COVID-19 with the different primary and secondary goals.

In this article we present a strategy of Mikaelyan University Hospital located in Yerevan, Armenia in managing patients with COVID-19. Preparing for patients' admission, developing of internal and external hospital communications, reconstruction, redistribution of human resources was carried out in parallel with trainings of health care workers, patients' education, etc. Mikaelyan University Hospital laboratory was reorganized to implement the new approaches and goals in managing of unprecedented number of patients and to secure quality control. The number of intensive care unit beds has been increased, also all possible efforts have been made to obtain all the required equipment and maintenance.

Overall, the strategy can be considered successful as it was based on the multidisciplinary and multisectoral approach including academic sector, clinicians, leadership, patients, decision makers, nurses, radiologists, psychologists, intensivists, etc.

Keywords: *pandemic, COVID-19, strategy, intensive care unit, healthcare infrastructure, workplace capacities*

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INTRODUCTION

More than two years since the first SARS-CoV-2 infections were reported, the COVID-19 pandemic remains an acute global emergency. As of November 2022, more than 640 million people have been infected with COVID-19, leading to 6.6 million deaths globally [*Coronavirus Statistics*]. The COVID-19 pandemic has deeply affected the lives of people across the world. Its health, economic, political, educational, and societal consequences have disproportionately affected the most vulnerable and those living in settings characterized by fragility risks, conflict, or violence [*WHO, 2022*]. Apart from being a global health concern, COVID-19 is having major consequences on the world economy [*Gupta M et al., 2020*]. The pandemic has generated a considerable economic burden on patients and the general population. Preventative measures only have partial success in lowering the economic costs of the pandemic [*Richards F et al, 2022*]. The pandemic has challenged local, national, regional and global capacities to prepare and respond. In addition, COVID-19 pandemic has created a global burden of mental illness that affects the general population as well as healthcare practitioners. Health systems globally have employed three common approaches to rapidly scale up health system infrastructure, namely by constructing new treatment facilities, converting public venues and reconfiguring existing medical facilities to provide care for patients with COVID-19 [*Haldane V et al., 2021*]. Considerable efforts were being made behind the scenes to develop new strategies to ensure adequate public healthcare infrastructure and workplace capacities. Hospitals have repurposed and reallocated internal space and redeployed resources to manage COVID-19 patients. Countries, such as Italy and Spain, discharged many patients from hospitals to their homes and postponed non-critical treatment and elective procedures. Also, Spain, Italy, and Portugal have converted rehabilitation facilities, hotels, public halls, and other suitable facilities into temporary COVID-19 hospitals, clinics, and laboratories. The latter strategy was proposed in a reflection on "fever hospitals", which were once used to isolate and treat people suffering from infectious illnesses [*Ndayishimiye C et al., 2021; Winkelmann J et al., 2021; Tonna J et al., 2020; Jefferson T, Heneghan C, 2020; Oliver D, 2021*]. The National University Hospital, Singapore, a 1200-bed public sector hospital, adopted a whole of hospital approach to COVID-19 in early January 2020 with 3 primary goals: zero hospital-acquired COVID-19 cases, all patients to receive timely necessary care, and maintenance of staff morale [*Brandon X et al., 2021*]. In many countries the situation has changed dramatically since March 2020, when the intensive care unit (ICU) occupancy rates reached 100% due to the pandemic. Crisis management team policies, ICU configuration strategy, staff and resource utilization, admission protocols, and therapeutic guidelines have been reviewed continually based on new international updates, emerging therapies, and the recommendations of the national health authorities [*Griffin K et al., 2020; Xie J et al., 2020; Lee L et al., 2020*]. Infection control was the key component for the management of COVID-19 in hospital. Initial planning began in collaboration with hospital epidemiologists and infection control staff, and relied heavily on available information about the infectivity of COVID-19 [*van Doremalen N et al., 2020; Alhazzani W et al., 2020*]. The rapid and unprecedented growth in the number of critically ill patients also raised the specter of difficult ethical decisions. Several groups globally have provided general guidelines regarding resource allocation in the setting of a challenging pandemic [*Faccincani R, Pascucci F, 2020; Emanuel E et al., 2020; Gostin L et al., 2020*]. Given the increased negative outcomes in older individuals or those with multiple comorbid illnesses, the need for discussions with palliative care and ethics consultants has become more acute [*CDC COVID-19 Response Team, 2019; 2020*]

To overcome it is possible, due to the uniting the knowledge and will of all doctors in the world

In this article we present a strategy, achievements and challenges of Mikaelyan University Hospital located in Yerevan, Armenia in managing patients with COVID-19.

The model of Mikaelyan University Hospital in managing patients with COVID-19

During the COVID-19 pandemic MUC has been reconfigured to admit patients with COVID-19 in March 2020. There were 100 beds in COVID-19 department and 40 beds in ICU, all equipped with the central oxygen supply. Preparatory activities for patients` admission have been carried out by the group of clinicians, nurses, leadership, clinical epidemiologists, laboratory workers, ICU physicians, radiologists, researchers, etc. Trainings based on available guidelines and literature were conducted not only for infectious diseases specialists but also for the all doctors who potentially could be involved in patients` care. Leadership was responsible for developing of internal and external hospital communications, and redistribution of human resources to improve patients`, samples` and information flow inside and outside of the hospital. To manage vulnerable population with COVID-19 specialists (endocrinologist, cardiologist, angiosurgeon, surgeon, neurologist, psychiatrist) were identified to provide daily consultations.

During a two-year period, we admitted a total of 2185 patients (1209 females and 976 mails). All patients were referred via triage center after receiving the positive PCR test result. 82.1% of them were from Yerevan, capital city of Armenia and only 17.9% were from the regions. The average age of the patents was 64.4±12.9. In admission intrahospital triage has been made to admit patient either to COVID-19 department or ICU. At the admission, 85.4% of patients admitted to COVID-19 department had pneumonia. Patients without pneumonia have been hospitalized because of different comorbidities including severe hearth problems, diabetes, neurological disorders, HIV-infection, etc. The average length of hospitalization was 11±5 days.

Analyzing the hospital admission of 2021, we clearly determined that there were two waves of admission – April-May and September-November, 2021 (Figure).

Daily examination of patients was organized during the first wave of COVID-19 with the chief of department, chief nurse and physicians. It was challenging and could lead to burnout of staff as examination of 100 patients a day could last more than 5 hours. That is why during the second wave we decided to modify our strategy. We conditionally divided the department into 3 subdepartments with their chief doctor and nurse. This approach was very productive to provide better care to patients, to have more time for patient-doctor conversation and for prevention of burnout among health care providers. As COVID-19 department was isolated and family members' visits were prohibited, we implemented a telecommunication mechanism for providing information to family members. It was a good practice as family members received reliable information directly from doctor who treats the patient. Disadvantage of this practice was emotional exhaustion, while communicating with people of different cultural, intellectual and emotional levels.

To improve and monitor daily drug prescription we adopted the existing patient's prescription list making it user friendly. Later monitoring showed that after this adaptation both doctors and nurses spent less time on drug prescription and administration.

Strong communication with the hospital epidemiologist was the key factor for successful infection control. Alongside with training of hospital personnel and monitoring of wearing personal protective equipment, other pillars like hand hygiene, measurement of surfaces, antibiotic stewardship were implemented. Patients' and samples flow (from the department to ICU, other hospital, laboratory, etc.) was developed taking into consideration the structure and capabilities of the hospital.

Nursing role during COVID-19 in the setting of hospital care was priceless, all healthcare workers,

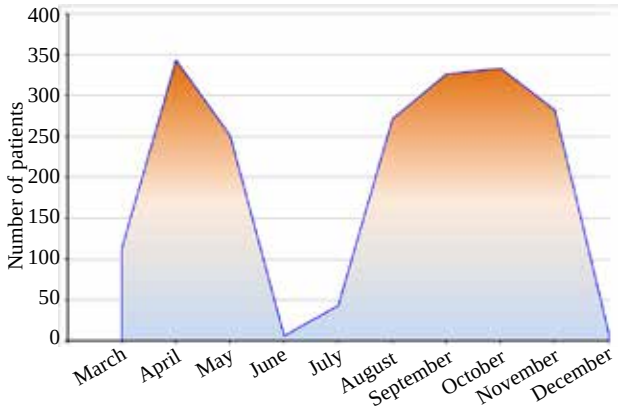

Figure. *Admission of patients to Mikaelyan University Hospital in 2021*

including nurses, technicians, and drivers have played an important and variegated role during pandemic months. In regard to nurses, they helped doctors not only in treating COVID-19 patients, but also in supplying nosocomial infection prevention and surveillance. Moreover, they provided health and screening education and support for the general population and high-risk categories.

Academic staff (professors, associate professors, researchers, etc.) is an integral part of the university hospital. Many departments and academic staff of Yerevan State Medical University are located in Mikaelyan University Hospital. Working in a remote mode with the medical students, academic staff has been actively involved in the work improvement process by reviewing national and international guidelines, conducting trainings, implementing the results of research projects, publicizing and educating general population via media.

Leadership of the hospital had an important role in communication with the national authorities, ministries and inspection bodies. They support the hospital staff in implementing of new methods, approaches, pilot projects. The bilateral communication from up to down and vice versa was improved by making the voices heard.

The laboratory of Mikaelyan University Hospital was reorganized to implement the new approaches and goals in managing of unprecedented number of patients with COVID-19 and to secure quality control. A baseline number of laboratory investigations, including full blood count, serum electrolytes, renal and hepatic function, coagulation study, C-reactive protein, D-Dimer, and lactate dehydrogenase have been performed in all cases. Laboratory staff was overwhelmed by work. Regular trainings were helpful to improve skills.

Patients' education was also very important as many of them came to the hospital with fare and hopeless. Patients and their families experienced many challenges, not only from the disease but also from social isolation and segregation from one another and their communities. Patient-centered care was critical for solving various problems within the hospital. Patients` education involved giving the patient information about his condition, its potential course, possible complications, treatment, etc. This information can cause great anxiety when people are isolated at the hospital. Sometimes anxiety impaired patients' ability to take in and process new information, and it was important that clinicians listen to and reassure the patients. Instructions for discharge were provided to all patients to prevent complications and infection spread in community. Also, the huge complain was organized to explain that the best way to prevent COVID-19 is to get vaccinated.

CONCLUSION

Our hospital has creatively developed and expanded our caregiving capabilities in multiple ways. Implementation of multisectoral and multidisciplinary approach was crucial to overcome all the challenges linked to unprecedented flow of patients. Involvement of academic sector was one of the privileges of the university hospital. Making ethical decisions and patient-centered approach had important role in emotional atmosphere of health setting. We provide potential guidelines for other centers to adapt as needed to help implement the dynamic and continuously improving model.

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