Reviewing COVID-19 from an anesthesiologist’s perspective in 2022: JA symposium

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Abstract
The COVID-19 pandemic is ongoing as of September 2022. Since January 2020 when the first case was reported in Japan, the medical community faced a variety of problems both domestically and internationally. It is meaningful to review the impact of COVID-19 from an anesthesiologist’s perspective to clarify our policy for future infectious disease outbreaks. In this year’s Journal of Anesthesia (JA) symposium, five experts who were deeply involved in the COVID-19 response reviewed the past 2.5 years and made recommendations for potential future pandemics. Anesthesiologists are specialists in airway management and their role in intubating patients with COVID-19 has received much attention. However, they have also played an important backup role in intensive care as critical care physicians and must be more involved in critical care in regular (non-pandemic) times to properly fulfill this role. It is especially important for the Japan Society of Anesthesiologists and JA to quickly disseminate accurate information on unknown infectious diseases to the medical community and wider society. Therefore, it is important to promptly publish papers that are quality-assured through peer review.

Keywords COVID-19 · Intensive care · Critical care physician · Anesthesiologist · Infodemic · Preprint

Introduction
The COVID-19 pandemic is ongoing as of September 2022. Since January 2020 when the first case was reported in Japan, the medical community, both domestically and internationally, has faced a variety of problems. It is important to review the impact of COVID-19 from an anesthesiologist’s perspective to clarify our policy for future infectious disease outbreaks.

A symposium entitled “Reviewing COVID-19 from an Anesthesiologist’s Perspective” organized by the Journal of Anesthesia (JA) was held at the 69th Japanese Society of Anesthesiologists (JSA) Annual Meeting (Kobe, Japan). Symposium speakers were: Dr. Nishida (Toyoake), President of the Japanese Society of Intensive Care Medicine; Dr. Morimatsu (Okayama), a member of the JSA Special Committee for COVID-19; Dr. Goto (Yokohama), President of Yokohama City University Hospital; Dr. Oda (Osaka), Chief of Department of Anesthesiology at Osaka City Juso Hospital, which became a specialized COVID-19 hospital; and Dr. Asai (Koshigaya), JA Associate Editor-in-Chief. Each of these speakers looked back on the past 2.5 years and made recommendations for potential future pandemics.
Epidemiology, drug therapy, ventilatory therapy, extracorporeal membrane oxygenation (ECMO), and vaccines (Nishida)

Pandemics cause global chaos for several years. In the United States and Europe, outcomes for critically ill patients who were hit by the surge in infection during the first wave of COVID-19 were disastrous. The rescue rate for ventilated cases in Japan during the first wave was about 80%, whereas the rate in New York City, where the intensive care delivery system collapsed, was only about 10%. This highlights the tragedy of the collapse of medical care rather than a difference in the level of medical care provided. The level of intensive care in Japan is among the best in the world in terms of ventilation and ECMO management performance. However, such care remains vulnerable to sudden medical surges such as during a pandemic. The first and fifth waves in Tokyo and the fourth wave in Osaka caused the medical system to collapse. Time passed since the outbreak, the mortality rate among COVID-19-infected population has declined worldwide, possibly due to the less lethality of new variant, accumulation of treatment methods among healthcare communities, development of therapeutic agents and vaccines, and the increase of vaccinated population. In Japan, however, the number of affected individuals has increased dramatically, and the absolute number of deaths has increased compared to the early days.

The proportion of severely ill patients eligible for treatment in Japan was largest during the fifth wave of COVID-19 caused by the Delta variant, whereas the number of deaths was highest in the sixth and seventh waves of COVID-19 caused by the Omicron variant, when the number of infected people had dramatically increased. Considering the medical situation during the pandemic from an intensive care perspective, the number of major surgical procedures that met criteria for admission to intensive care units (ICUs) decreased in response to each wave.

A nationwide survey of ICUs conducted between July 19 and August 1, 2021, found that more than 70% of ICUs in Japan had been forced to limit the admission of other critically ill patients in order to care for COVID-19 patients during the pandemic. The most common unit conversion was from a general ward to a high care unit. Anesthesiologists accounted for 65% of the physicians who supported ICUs during the pandemic but were not generally assigned to ICUs. This suggested that anesthesiologists play an important role as a reserve for managing critically ill patients in pandemic situations.

The human resources required for patients with COVID-19 in ICUs increased as the severity of the illness increased, and ECMO management required two- to three-times the usual staffing. At the peak of illness among patients with severe cases, 60% of ECMO cases in Japan were COVID-19 cases, indicating that ECMO management of these patients placed a heavy burden on clinical practice. Our experiences of the COVID-19 pandemic suggest that it is necessary to establish a resilient system that can provide intensive care medicine at a consistently high level, even during a pandemic.

JSA special committee for COVID-19 (Morimatsu)

In the beginning of the COVID-19 pandemic in 2020, the JSA created a new committee focused on the pandemic (JSA Special Committee for COVID-19) that included three delegates (President Koitabashi, Dr. Ozawa, and Dr. Morimatsu). The two main goals of the committee were to: (1) provide current information regarding clinical anesthesia relevant for patients with COVID-19; and (2) collect weekly data for the total number of operations performed and suspected/positive COVID-19 cases. The average weekly number of operations performed in 2019 was also collected to enable calculation of the weekly ratio of operation restrictions. The JSA website published several information updates along with the number of cases on a weekly basis and a summary of case reports; 30 updates were published between March and September 2020. The average number of operations as of the end of April 2020 was almost 80% that in 2019, but gradually recovered to 100% by mid-July. In total, there were 20 COVID-19-positive patients between March and September 2020. Of these positive cases, 40% underwent tracheostomy, and cesarean section was performed in 30%.

In summary, the JSA Special Committee for COVID-19 published updated anesthesia-related information related to COVID-19, and conducted and reported two surveys of the number of operations and case reports for COVID-19-positive patients. We believe that this information helped and encouraged JSA members in anesthesia management during the ongoing pandemic.

Anesthesiologists’ participation and reinforcement of ICUs are critical in preparing for the next pandemic: from the hospital director’s perspective (Goto)

To attend to patients with COVID-19, a patient-nurse ratio of about 1:1 was needed for severe disease cases (requiring nasal high flow or mechanical ventilation) and 3–4:1 for moderate disease cases (requiring oxygen). To secure enough nurses to care for patients with COVID-19, most hospitals had to close general wards and reduce other medical and surgical care. Data from the National Cancer Center demonstrated that the number of early diagnoses and surgeries for several cancers declined in 2020 compared with
2019 (pre-COVID-19 year). This suggested that the massive patient load associated with COVID-19 forced us to deliver suboptimal care to patients without COVID-19.

To prevent this situation in a future pandemic, we should increase the number of ICUs and high care units (HCUs) so we can train and secure enough healthcare professionals, including nurses and doctors, during the non-pandemic period. Japan has relatively few ICU and HCU beds per population compared with other Organisation for Economic Co-operation and Development countries. Increasing the numbers of ICU and HCU beds is also reasonable from a hospital management perspective because general wards are becoming increasingly busy as hospital stays become shorter, and ICU and HCU beds serve to reduce the burden on general wards by caring for patients who require intensive care and extra staffing resources. Anesthesiologists can and should play active roles in caring for severely ill patients during a pandemic, especially as there are insufficient emergency physicians and infectious disease physicians. To support this role, anesthesiologists should also participate in critical care during regular, non-pandemic periods.

**Patient profiles and the role of anesthesiologists in a specialized COVID-19 hospital (Oda)**

Our hospital, which used to be a 263-bed general hospital, changed to a specialized COVID-19 hospital on May 1, 2020, with a maximum admission capacity of 70 patients [1, 2]. We report the role of anesthesiologists, and profiles and treatment of patients at our hospital during the past 2 years.

All medical staff including physicians, nurses, and medical engineers, were dedicated to caring for patients with COVID-19 with mild to moderate severity. We provided medical services as attending respiratory physicians, but experienced difficulties in treating patients with uncontrolled diabetes mellitus or dementia. Anesthesiologists also performed emergency endotracheal intubation in patients with deteriorated respiratory condition, in addition to preparing for emergency surgery for patients with COVID-19.

There were six waves of the COVID-19 pandemic in Japan, which resulted in a rapid increase in the number of patients in our hospital. A total of 2000 patients (male \(n = 1,050\), female \(n = 950\); median age 66 years) were admitted up to May 10, 2022. Severity on admission was mild, moderate I, and moderate II in 597 (30%), 905 (45%), and 461 (23%) cases, respectively. The remaining 37 (2%) cases were in severe condition and required intensive care. They received treatment including antiviruses medication and oxygen therapy, including nasal high flow oxygen administration. Respiratory condition recovered in 1769 (88%) patients and worsened in 123 (6%) patients who were transferred to advanced hospitals; 85 (4%) patients died. Notably, there was a shortage of hospital beds for COVID-19 cases in Osaka during the fourth wave in March and May 2021 [3], which prevented transfer of patients with deteriorated respiratory condition from our hospital to advanced hospitals and resulted in an increased mortality rate.

Our hospital reopened its outpatient department and resumed surgery on July 27, 2020, with full operation resuming on April 1, 2022. Anesthesiologists were gradually focusing on anesthesia in the operating room and stopped working as attending doctors for patients with COVID-19 after November 2020. Our hospital is regaining function as a general hospital with the number of surgeries increasing to approximately 50% of that before COVID-19.

**Infodemic: the role of academic journals and preprints (Asai)**

Shortly after the World Health Organization declared the outbreak of coronavirus infectious disease-2019 (COVID-19) a pandemic in March 2020, it became clear that the mortality rate was high, and that the virus was highly contagious, meaning reliable information was urgently required to treat patients and minimize the risk for cross-transmission of infection to healthcare workers and other patients. However, fear about the pandemic was fanned by an “infodemic,” which refers to a rapid spread of information about something, such as a disease. Some mass media strongly promoted PCR testing and reported numerous “effective” preventative and treatment methods for COVID-19 on a daily basis, but this information was frequently not evidence-based.

To practice evidence-based clinical decision-making, we need reliable sources of information, but a major problem was that such reliable information had not been reported in reputable journals. Therefore, we needed to obtain information from statements made by academic societies or reports made by healthcare workers on social media, but these were frequently not reliable. Preprints, or scientific manuscripts that authors post online before formal peer-review and publication in a journal, have recently become a potentially useful source of information. However, in principle, we should not use preprints for clinical decision-making and policy formation. Traditional peer-review journals made efforts to address the infodemic issue. For example, journals, including the JA, accelerated the review process to allow rapid decisions to be made on whether to publish/not to publish articles, and they uploaded accepted articles as Epubs ahead of print. In addition, subscription-based journals made all the articles related to COVID-19 free to read, download, and share. However, it is our responsibility to keep managing the infodemic.

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