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Letter to the Editor "Effects of Coronavirus Disease 2019 (COVID-19) Pandemic on Neurological Surgery Care and Education; Our Experience from Iran"



LETTER:

Following the incidence of primary cases of pneumonia with unknown origin in Wuhan, China, in late December 2019, Chinese Center for Disease Control and Prevention began an investigation on the condition and finally on January 7, 2020, the newly identified severe acute respiratory syndrome coronavirus 2 was reported as the main pathogen.¹ Then, it took approximately 50 days for the first 2 definite cases of coronavirus disease 2019 (COVID-19), in Qom province, to be officially announced by Iranian Ministry of Health and Medical Education on February 19, 2020, before the outbreak turned into a "pandemic."² Essential actions had to be taken; therefore, all the schools, universities, and other educational institutes as well as mosques, religious schools, and holy shrines were closed. Medical schools were not an exception; however, some schools offered online courses. Medical interns and residents, who have a bold role in providing health care in Iran's university hospitals, had to stay at work.

Iran University of Medical Sciences and Health Services is 1 of 3 main medical universities in Tehran, Iran. It offers a variety of medical residency training programs, including neurologic surgery. Rasool-e-Akram is one of the main university hospitals of Iran University of Medical Sciences and Health Services with a neurologic surgery residency program. Following the order of the Iranian Ministry of Health and Medical Education, all outpatient clinics were shut down and residents, regardless of their educational program, were responsible for visiting and managing patients with COVID-19 in emergency and ward shifts. All the elective surgeries were canceled and postponed after the official announcement of the COVID-19 outbreak.

We have retrospectively assessed the data on emergency and elective neurologic surgeries in Rasool-e-Akram Hospital

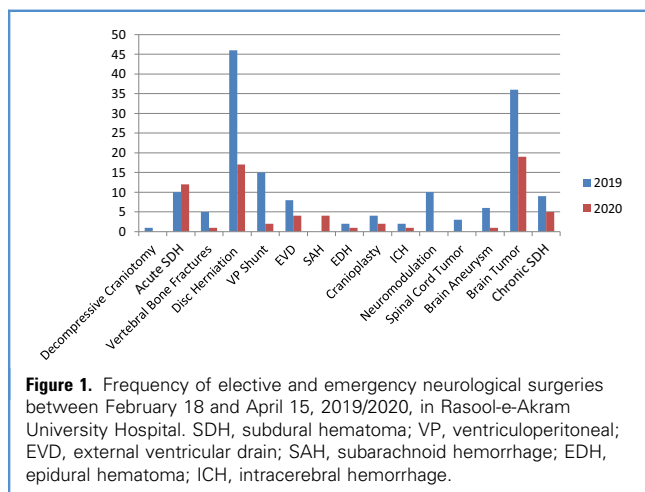


Figure 1. Frequency of elective and emergency neurological surgeries between February 18 and April 15, 2019/2020, in Rasool-e-Akram University Hospital. SDH, subdural hematoma; VP, ventriculoperitoneal; EVD, external ventricular drain; SAH, subarachnoid hemorrhage; EDH, epidural hematoma; ICH, intracerebral hemorrhage.

between February 18 and April 15, 2020, and the same period in 2019. Data were extracted using hospital's online patient registry system and included patients who underwent surgery by neurosurgeons during the determined time period. **Figure 1** summarizes the frequency of various conditions that led to surgical intervention. We noticed a remarkable decrease (approximately 56%) in elective and emergency neurological surgeries in 2020 (69 total surgeries) in comparison with the same time period in 2019 (157 total surgeries) as a result of the COVID-19 pandemic.

It is evident that notable decreases in outpatient clinic visits as well as elective and emergency surgeries have negative effects on residency training programs. In Iran, residents take a promotion examination each year to be qualified for the higher postgraduate year, which is now postponed. The promotion examination is one of the main limited opportunities for residents to study, beside their heavy and prolonged shifts. In addition, higher postgraduate year qualifications involve the accomplishment of predefined numbers of surgeries and procedures recorded in a logbook, which are not expected to be fulfilled in the current situation. Implementation of online surgical courses and grand rounds from other hospitals that are not considered for COVID-19 management could be a solution.

The current pandemic situation has affected not only neurologic surgery education but also neurosurgical care. Attendance to emergency departments as well as outpatient clinics has faced a dramatic decrease. Patients with important new complaints such as severe headaches (which may be a result of subarachnoid hemorrhage) or those with chronic conditions such as hydrocephalus may have postponed their visits as a result of the pandemic. Therefore, we can expect to face the complications of late intervention as the clinics are reopened. As the pandemic is getting close to being controlled, we hope the neurosurgical care and education return to its normal situation. This pandemic has taught us to provide more education on when to attend neurosurgery clinics during pandemics, if necessary, for the general population and also to get ready for newer educational modalities for residents.

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REFERENCES

- Wu Z, McGoogan JM. Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: summary of a report of 72 314 cases from the Chinese Center for Disease Control and Prevention. *JAMA*. 2020; 323:1239-1242.
- World Health Organization. Coronavirus disease 2019 (COVID-19). Situation Report – 51. Available at: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200311-sitrep-51-covid-19.pdf?sfvrsn=1ba62e57_10. Accessed May 5, 2020.