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## Letter to the Editor Regarding "Early Effects of COVID-19 Pandemic on Neurosurgical Training in the United States: A Case Volume Analysis of 8 Programs"

### Letter:

We read with great interest the article "Early Effects of COVID-19 Pandemic on Neurosurgical Training in the United States: A Case Volume Analysis of 8 Programs."[1] In this article, Aljuboori et al[1] have described the impact of the COVID-19 pandemic on neurosurgery resident training in 8 residency programs in different parts of the United States of America. The authors retrospectively reviewed the monthly operative case volumes in these 8 participating institutions for 2019 and January–April 2020 and observed that compared with 2019, March and April 2020 average cases declined by 15% and 49%, respectively, and this result was statistically significant. They also observed that there was a significant decline in elective cranial and spinal cases, while there was no significant decline for nonelective/emergent cases. These findings resonate with our findings from India where we analyzed the data of neurosurgery patients who underwent surgery at our institution during the "lockdown" period in India (March 25 to May 31, 2020) and compared it with data of the same duration in the preceding year (March 25 to May 31, 2019).[2] During the "lockdown" period in 2020, we performed 53 surgeries (47 emergency, 6 routine) compared with 111 (47 emergency, 64 routine) during the same duration in 2019, indicating an overall decline of 52.2%.[2-6] The number of emergency cases in our study were not affected much due to the pandemic, while the number of elective cases declined remarkably. On comparing our operative workload per specialty with the pre–COVID-19 era, a decrease in number of cases was noted across all specialties (neurooncology, neurotrauma, cerebrovascular, congenital, degenerative spinal disorders). The number of cases for cerebrospinal fluid diversion were least affected during the pandemic.[2,7-9] Resident training has been affected adversely as the COVID-19 pandemic has forced neurosurgical centers from across the world to restrict their operative and outpatient volumes.[10-30]

In a survey conducted among 118 neurosurgery residents from India from May 7 to 16, 2020,[31] we observed a significant decline of 67.5% in the surgical exposure of residents since the onset of the pandemic, with the average number of surgeries performed by a resident dropping from 39.9 to 12.3 per month (P value = 0.000). Departments of >60% of our respondents had transitioned from physical classroom teaching to video conferencing platforms to conduct academic sessions, and the number of academic sessions had decreased by 32.6% from a median of 5 per week to 2 per week (P value = 0.000).[8,9] In their study, Aljuboori et al[1] surveyed a lead resident from each participating program regarding their perceptions of the impact of COVID-19 on neurosurgical training. All respondents reported that they had transitioned from "in-person" to online sessions for didactics, and 75% reported that didactics had been negatively affected in their program. Similarly, for neurosurgery consultations, half of the programs had transitioned to telemedicine, both in India and the United States.

In our survey from India, we found that almost half of the residents had been posted in COVID-19–related duties, while no resident in the participating programs in the United States had been deployed to provide nonneurosurgical clinical care. Three-fourths of our respondents from India reported hampering of research activities, probably due to decreased interaction with patients.[31] Interestingly, 87.5% of the residents from the United States reported an increase in research time, and 62.5% reported an increase in their number of publications during this time.[1] During the pandemic, most neurosurgery residents from India resorted to self-study (83.89%), scientific writing (43.22%), and attending online educational programs (73.72%) in the extra time available.[31] The majority of our respondents (88.13%) from India felt that the pandemic would have an adverse impact on their operative and clinical skills, while only 37.5% respondents from the United States in Aljuboori's[1] study felt so. The respondents from India planned to pursue a fellowship, extend their tenure as resident upon completion, or study more in order to compensate for the loss in training.[31]

Many authors from across the world have voiced similar concerns regarding the impact of the COVID-19 pandemic on neurosurgery training.[32-36] Zoia et al[32] from Italy reported that surgical exposure during the pandemic has decreased for 78.6% of residents, while 16.1% did not operate at all. Burks et al[30] from Miami in the United States reported that their residents logged in an average of 15 (58%) and 5 (20%) fewer cases in April 2020 and May 2020, respectively, and this result was statistically significant. They suggested increasing the number of residents scrubbing in each case to at least partially make up for the loss in surgical exposure.[30] Cadaveric dissection or surgical simulators should be used to make up for lost surgical exposure during the pandemic. However, according to Aljuboori et al,1 it is not being done even in the 8 residency programs in the United States that participated in their study. Neurosurgery training is a crucial time for the residents to learn as much as they can. Neurosurgery training is multifaceted and encompasses acquiring a thorough knowledge of anatomy, learning clinical and operative skills, and focus on research and academics. The training period prepares the neurosurgery residents for their future as a neurosurgeon. All attempts should be made to ensure that the neurosurgeons of the future have a sound knowledge and good skills. It is heartening to see that various neurosurgery bodies have stepped up to the challenge and are contributing to resident training by conducting online educational programs.[37-39]

### CRediT AUTHORSHIP CONTRIBUTION STATEMENT

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