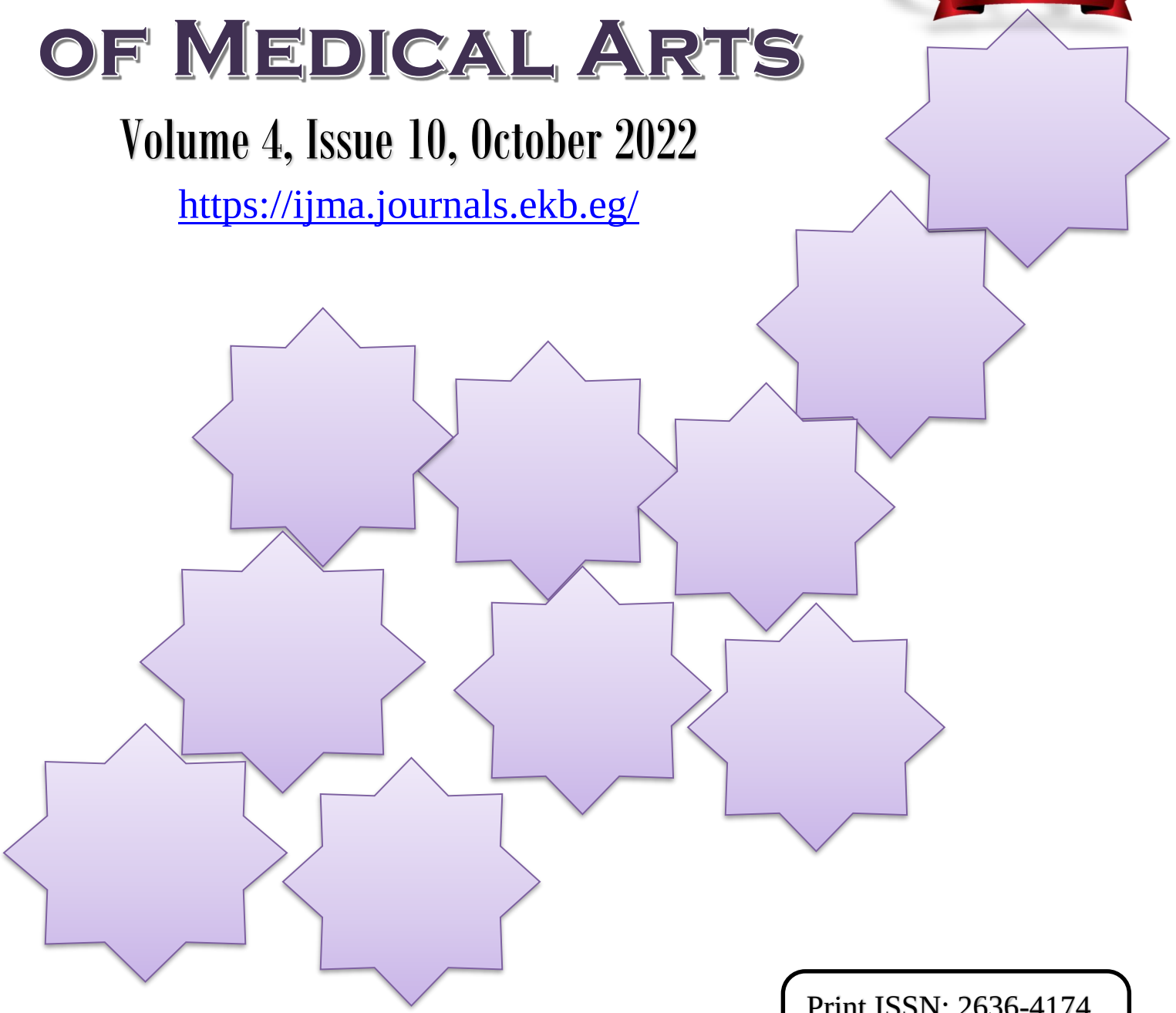
International Journal of Medical Arts

Volume 4, Issue 10, October 2022

https://ijma.journals.ekb.eg/



Print ISSN: 2636-4174

Online ISSN: 2682-3780

Available online at Journal Website
https://ijma.journals.ekb.eg/
Main Subject [Neurosurgery]

Original Article

Acing the COVID-19 Era: Experience and Innovation in a Tertiary Care Neurosurgical Unit

Mudassar Abbas [1]*, Sara Hanif [2], Saad Javed [1], Yasir Shehzad [1], Nadeem Akhtar [1], Eesha Yaqoob [3], Bipin Chaurasia [4]*

[1] Department of Neurosurgery, Rawalpindi Medical University, Rawalpindi, Pakistan
[2] Department of Anesthesiology, Rawalpindi Medical University, Rawalpindi, Pakistan
[3] Department of Sociology, PMAS Arid Agriculture University, Rawalpindi, Pakistan
[4] Department of Neurosurgery, Neurosurgery Clinic, Birgunj, Nepal

Article information

Received: 06-11-2022

Accepted: 20-12-2022

DOI: 10.21608/IJMA.2022.173189.1546

*Corresponding author

Email: trozexa@gmail.com

Citation: Abbas M, Hanif S, Javed S, Shehzad Y, Akhtar N, Yaqoob E, Chaurasia B. Acing the COVID-19 Era: Experience and Innovation in a Tertiary Care Neurosurgical Unit. IJMA 2022 October; 4 [10]: 2698-2704. doi: 10.21608/IJMA.2022.173189.1546.

ABSTRACT

Introduction: After declaration of pandemic, economy as well as the health system of the world was crippled by this deadly virus. Neurosurgeons across the world were trying their best to overcome this pandemic without compromising the patient care and learning curricula of future Neurosurgeons, by having minimum exposure.

Aim: The aim of our study was to evaluate the burden of COVID-19 in our hospital and how we tackle this during pandemic.

Objective: This paper will help to devise new strategies for upcoming Neurosurgeons by seeing our previous experience we gained at DHQ Hospital Rawalpindi within the limited resources during this pandemic. This also insights into how successfully we arranged and managed the patient care and academics so that none should be deficient. With this in future how can we cope up this situation without any difficulty.

Methodology: This study was designed as quality improvement study. We revised our procedural lists by postponing the cold cases, observing different scales and adopting the feasible one in our setup, decreased the number of staff and managed inward stay of patient by reducing its stay. Only bed bound and trauma patients with vegetative state or critical state were allowed to stay in ward.

Results: Patient load was reduced from average 60-80 patients in OPD. Many surgeries were postponed. The decrease in the stay was statistically significant in terms of its p value.

Conclusion: Academics as well as patient care was compromised in this sudden surge of pandemic but effective strategy helped us to come out of this situation. And this strategy will help future Neurosurgeons and researchers to provide best patient care and knowledge if such kind of emergency ever hit back.

Keywords: Neurosurgery; COVID-19; Pandemic

Introduction

From Wuhan China, it was heard that some virus of unknown etiology has been reported in early December 2019 which was causing pneumonia of unknown origin. The causative agent turned out to be a novel strain of corona virus. The disease was later named corona virus disease 2019 [COVID-19] [1].

By mid-January, the first case outside of China was reported. With rapidly worsening situation and increased mortalities, World Health Organization Declared it as pandemic by March 11, 2020 [1]. In Pakistan situation was worsened after first case of corona virus was detected in Sindh on 26 February 2020 [2].

First case at Lahore in Pakistan was reported on 11 March 2020 [3]. This current situation caused by corona virus had caused devastating impact globally including health care system and economy. Everyone was striving to adapt better system to continue work in current situation with all the available resources. Neurosurgical mentors around the globe were also trying to overcome the deficiency of academics faced by neurosurgical aspirants. Patient care in this situation became challenge for the community. They devised best plans to continue medical education and treatment in this worst scenario by arranging virtual webinars, zoom meetings, online prescriptions for most of the patients and strict COVID measures for operative cover [4].

The neurosurgical community in developing countries could not insulate itself from the implications of the COVID pandemic and adapted rapidly to the changed scenario in health care delivery. Suspension of elective procedures, severe curtailment of regular outpatient appointments, drastic modifications of the normal OPD/operating room practices and apprehensions related to inadequacy of safety provided by PPE use and financial losses of private establishments were some of the visible themes in our survey results. Although telemedicine and virtual learning had not been as widely adopted as expected, online education had been favorably received [5-9].

About Neurosurgery DHQ

Neurosurgical ward in DHQ hospital Rawalpindi is one of the most renowned trauma centers and bears the load of almost all the northern areas of Pakistan. The academic Staff consists of one Professor who is the head of the department, one Assistant Professor, four Senior Registrars and seventeen Resident Doctors with two Medical Officers [Table 1].

Table [1]: Academic Neurosurgeons at DHQ Hospital, Rawalpindi

Post	Qualification	Supervisor Status
Professor	FCPS	Yes
Assistant Professor	FCPS	Yes
Senior Registrar	FCPS	Nil
Senior Registrar	FCPS	Nil
Senior Registrar	MS	Nil
Senior Registrar	FCPS	Nil
Medical Officer	MS [Training complete]	N/A
Resident Trainees	MS/FCPS [17]	N/A
Medical Officer	MBBS	N/A

Before the Pandemic

Before the pandemic it was usual and there was proper Outpatient department, ward rounds, indoor patient admission and proper operation list preparation and operations.

Whole faculty with residents conducted the ward rounds and after round discussions were done.

Academic sessions were conducted. Our operation list was conducted five days a week with average 32 cases/week including complex Brain and spine surgeries. Emergency cases were conducted as usual and on average more than 35-40 cases per month were done.

Outpatient rush was around 4000 patients and were checked in a month on average by on call team. In duty roster every dedicated team under expert's supervision perform their duties.

Academic sessions, Journal club meetings, case presentations and Skill lab etc. were conducted.

After the Outbreak

Things were panicked when WHO announced the Pandemic. Hospital staff and senior faculty had multiple meetings and it was decided to make protocols to tackle these situations. In neurosurgery DHQ in the beginning we worked with the same roster as before the pandemic and it resulted in increased infection rate among the attending doctors. In first round our four Doctors were infected with the virus. Immediately we devised a new roster named 'Corona Roster' for doctors to perform their duties effectively without compromising the patient care.

Academics were shifted online. Ward rounds were limited and Outpatient and Indoors were limited with strict SOP's prescribed by the government.

We took help from online strategic chart by American college of surgeons as shown in the table 2.

Following is the proposed table for priority criteria for Onco-logical pathology to be followed [Table 3].

Table [2]: For operative cover we triage the patients according to the emergency and following tiers were followed in the beginning [6]

Category		Example of pathologies	Recommendations
Tier-1	Low-acuity treatment or service	Cosmetic surgeries/elective surgery	Neurosurgeries do not fall in this category
Tier-2	Intermediate- acuity treatment or service Not life-threatening but potential for causing severe disability if not treated in time	Slow growing spinal cord tumors or, no eloquent intracranial tumors	Postpone the procedure, if possible
Tier-3	High-acuity treatment or service Immediately life-threatening	Acute trauma Intracranial bleed Space-occupying lesion with significant midline shift Lesions causing deterioration in conscious level	Proceed without delay as long as resources are available

Table [3]: Priority criteria for oncological pathologies

Category	Pathologies	Recommendations
A++	Intracranial or spinal oncological pathology causing • Rapidly evolving intracranial hypertension with deteriorating state of consciousness • Rapidly evolving intracranial hypertension with deteriorating state of consciousness • Acute hydrocephalus • Acute spinal cord compression with rapid tetra or paraparesis	Requires immediate treatment
A+	Intracranial tumors • with mass effect • with progressive neurological deficit • without deterioration of consciousness	Requires treatment within a maximum of 7–10 days
A	• Pathology that appears to be of suspected malignant nature on radiology • or with oncological pathology that determines a neurological deficit	Requires treatment within a month

Oncological patients in Neurosurgery department in DHQ hospital were classified and proposed to be operated upon classification devised by **Zoia *et al.*** [8] during COVID 19 pandemic. This was proposed scale for neuro-oncological procedures.

We chose proposed adaptive neurosurgery acuity scale in Indian scenario which was found very favorable and easy to handle the situation [7, 10]. it was discussed with Anesthesia department also to minimize the risk of exposure [Table 4]. But the use of sanitizers, maintaining a safe distance and thorough washing of hands were considered the main modalities to be safe.

Table [4]: Proposed Neurosurgical Scenario Acuity Scale in Indian Scenario

Category	Examples [not limited to]	Recommendation for surgery
Emergent cases [high acuity]	• Trauma • Stroke [SAH, ICH, IVH] • Large SOLs with significant MLS, with deterioration of consciousness • Spinal cord lesions with severe cord compression • Pituitary apoplexy with visual deterioration or altered sensorium • Acute hydrocephalus • Chronic SDH with significant MLS [>5 mm] • Cauda equina	Operate urgently • Wear standard PPEs if symptomatic or any significant history [international visit/contact with infected/HCWs working in COVID-care units
Urgent cases [high acuity]	• Large SOLs without deterioration of consciousness • Malignant brain and spine tumors • Posterior fossa lesions • Spinal cord lesions without cord compression • Lesions lying near eloquent areas • Pituitary lesions with constant threat to vision • Chronic SDH without significant MLS [< 5 mm] • Progressive cervical myelopathy • Complete preganglionic brachial plexus injury	• Patients must be screened for COVID-19 before surgery
Non-urgent cases [Intermediate acuity]	• Symptomatic benign intracranial lesions without local or generalized mass effect • Low-grade glioma • DBS for progressive parkinsonism • Refractory epilepsy • Spontaneous disc prolapse without significant neuronal compression • Small pituitary lesions with no mass effect • Unruptured aneurysm • Arteriovenous malformation • Craniosynostosis • Partial brachial plexus injury	• Should be postponed, if possible • Must screen before surgery if being operated
Non-urgent cases [low acuity]	• Peripheral nerve surgery [e.g., carpal tunnel release] • Benign intracranial tumors [asymptomatic or mildly symptomatic] • Microvascular decompression of cranial nerves • Deep brain stimulation • Degenerative spinal pathology [lumbar stenosis and spinal deformity] • Gamma knife radiosurgery	• Postpone the surgery

Abbreviations: DBS, deep brain stimulation; HCW, healthcare worker; ICH, intracerebral hematoma; IVH, intraventricular hematoma; MLS, midline shift; PPE, personal protection equipment; SAH, subarachnoid hemorrhage; SDH, subdural hematoma; SOL, space-occupying lesion. In Neurosurgical treatment no online treatment was advised. Patients were called upon according the severity index and scale described above.

Results

Patient Dynamics: Strict measures were taken, in which there was a successful postoperative patient reduction in the duration of hospital stay for admitted and operated patients. Thus, reducing potential exposure for them also by limiting their attendants. The average stay duration was reduced from 7.2 ± 5.2 days in January 2019 [range 1-15] days to 2.7±3.6 days in February 2020[range 0-7 days]. The decrease in the stay was statistically significant p=<.05

The mode for duration of stay i.e. most frequent stay period, showed a decrease from seven days to just nearly three days while comparing data for these months on average [Figure 1].

Although we postponed all elective emergencies according to our proposed Indian scale, but trauma patients were seen accordingly without any interruption and it was increased up to 30% where total patients admitted in June 2020 were significantly higher than admitted in June 2019.

Elective procedures were done accordingly under strict protocols suggesting no patient compromise shown in tabulated form [Table 5/Figure 2].

Attitudes always matters. In our setup strict compliance towards the prescribed SOP's and strict 1:1 attendant to patient ratio during these days were the main goals that we provided the best patient care even during this pandemic without losing any of our team member.

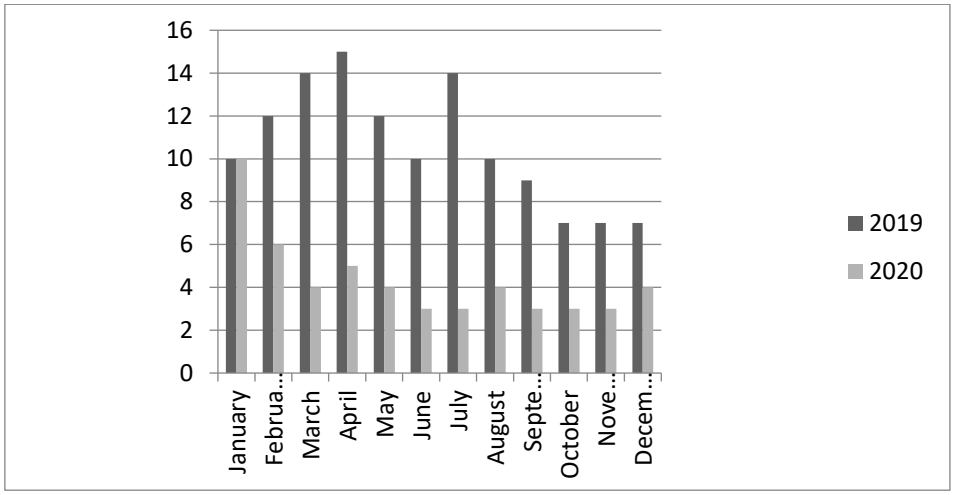


Figure [1]: Post-operative patient reduction in the duration of hospital stay for admitted and operated patients [vertical axis showing number of days of hospital stay]

Table [5]: Elective list for operation comparison in early 2019 and 2020

Month/Year	Cases Under G/A on Elective List
January 2019	40
January 2020	20
February 2019	38
February 2020	15
March 2019	35
March 2020	12
April 2019	37
April 2020	25
May 2019	27
May 2020	13
June 2019	20
June 2020	13

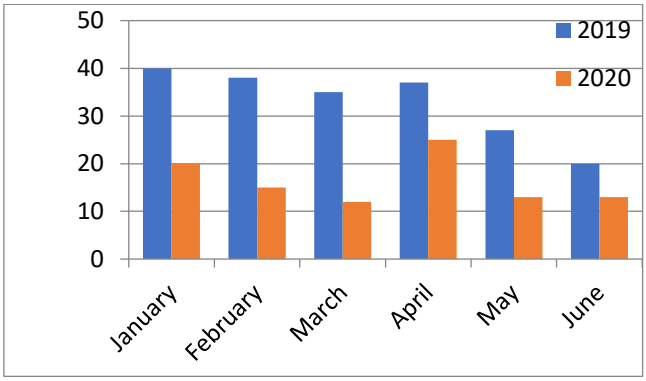


Figure [2]: Elective list for operation comparison in early 2019 and 2020 [vertical axis denoting number of cases admitted]

Academics

In Neurosurgical ward of DHQ Hospital Rawalpindi, total number of residents is 21 who conduct the academic round with senior faculty. When asked 14 out of 21 which is 70% were in the favor of virtual learning in the times of COVID-19 [Figure 3]. But 30% were worried about lacking clinical and hands on training. For which solution devised was that only call batch will conduct round. And case discussion will be in separate room with SOP's and rest study session will be conducted virtually. So that training period should not be compromised.

Figure [3]: Preference of residents to virtual learning

Future directions and recommendations

This Pandemic taught us many new things. Among them working with harmony and teamwork within limited resources under this pandemic pressure was the best part. We learn and recommend the triage of the patients and their categorization according to the illness and need of treatment. If emergency treatment is needed, we should treat them in separate wards on priority basis where combined care can be given under strict COVID-19 measures for the benefit of the patients.

Elective surgical procedures should be reviewed prior to the surgery and if urgent treatment needed, should be given after applying protocols as advised.

A separate fully equipped COVID-19 ward for COVID positive patients should be established to stop the spread of the infection as other departments also demanded.

Proper visits of the infection control teams should be paid to maintain the good hygiene of the wards and hospitals.

Good hygiene is guarantee of good practice and patient safety.

Conclusions

COVID-19 has badly affected our practices and as health care providers and still new variants are being reported.

Academics as well as patient care was compromised in this sudden surge of pandemic but effective strategy helped us to come out of this situation. And this strategy will help future Neurosurgeons and researchers to provide best patient care and knowledge if such kind of emergency ever hit back.

List of abbreviations:

OPD: Out-patient department

PPE: Personal Protective Equipment

DHQ: District Headquarter

SOPs: Standard Operating Procedures

SAH: Subarachnoid Hemorrhage

ICH: Intracranial Hemorrhage

IVH: Intraventricular Hemorrhage

SOL: Space Occupying Lesion

MLS: Midline Shift

HCW: Healthcare Worker

SDH: Subdural Hematoma

DBS: Deep Brain Stimulation

Ethical Consideration:

We obtained no objection certificate from our hospital Ethical Review board.

Conflict of interest: None

Financial Consideration: No financial load and consideration.

Authors contributions: all authors have equal contributions in preparing manuscripts

REFERENCES

1. Fontanella MM, De Maria L, Zanin L, Saraceno G, Terzi di Bergamo L, Servadei F, *et al*. Neurosurgical Practice During the Severe Acute Respiratory Syndrome Coronavirus 2 [SARS-CoV-2] Pandemic: A Worldwide Survey. World Neurosurg. 2020 Jul;139:e818-e826. doi: 10.1016/j.wneu. 2020.04.204.
2. Waris A, Atta UK, Ali M, Asmat A, Baset A. COVID-19 outbreak: current scenario of Pakistan. New Microbes New Infect. 2020 Apr 14;35:100681. doi: 10.1016/j.nmni. 2020.100681.
3. Tandon V, Raheja A, Mishra S, Garg K, Dash C, Borkar SA, *et al*. Trends in Neurosurgical Teleconsultation Services Across the Globe During COVID-19 Pandemic. World Neurosurg. 2021 Jun;150: e645-e656. doi: 10.1016/j.wneu.2021.03. 070.
4. Deora H, Mishra S, Tripathi M, Garg K, Tandon V, Borkar S, *et al*. Adapting Neurosurgery Practice During the COVID-19 Pandemic in the Indian Subcontinent. World Neurosurg. 2020 Oct;142:e396-e406. doi: 10.1016/j.wneu.2020.07.038.
5. Aggarwal A, Agosti E, Singh PM, Varshini A, Garg K, Chaurasia B, Zanin L, Fontanella MM. Scientometric analysis of medical publications during COVID-19 pandemic: the twenty-twenty research boom. Minerva Med. 2021 Oct;112[5]:631-640. doi: 10. 23736/S0026-4806.21.07489-9.
6. Lavadi RS, Bozkurt I, Harikar MM, Umana GE, Chaurasia B. The Role of Social Media on the Research Productivity of Neurosurgeons During the COVID-19 Pandemic. World Neurosurg. 2022 Sep 16; 167:e1419–25. doi: 10.1016/j.wneu.2022.09. 051.
7. Chaurasia B, Chavda V, Lu B, Garg K, Montemurro N. Cognitive deficits and memory impairments after COVID-19 [Covishield] vaccination. Brain Behav Immun Health. 2022 Jul;22:100463. doi: 10.1016/j.bbih.2022.100463.
8. Zoia C, Bongetta D, Veiceschi P, Cenzato M, Di Meco F, Locatelli D, Boeris D, Fontanella MM. Neurosurgery during the COVID-19 pandemic: update from Lombardy, northern Italy. Acta Neurochir [Wien]. 2020 Jun;162[6]:1221-1222. doi: 10.1007/s00701-020-04305-w.
9. LE CH, Nawabi N, White C, Garba DL, Umana GE, Lawton MT, *et al*. Social media in neurosurgery during COVID-19: an evaluation of the role of Neurosurgery Cocktail platform. J Neurosurg Sci. 2022 Sep 16. doi: 10.23736/S0390-5616.22. 05845-3.
10. Varela S, Kazim SF, Schmidt MH, Chaurasia B, Dicpinigaitis AJ, Ogulnick JV, *et al*. Neurosurgery virtual education in the COVID-19 pandemic era: results of a global survey. J Neurosurg Sci. 2022 Jun;66[3]: 274-277. doi: 10.23736/S0390-5616.21. 05579-X.

International Journal of Medical Arts

https://ijma.journals.ekb.eg/
Print ISSN: 2636-4174
Online ISSN: 2682-3780