LETTER TO EDITOR

Coronavirus Disease (SARS-CoV-2) and Neurocritical Care: Challenges for Neurosurgeons

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Abstract

Neurocritical care is an important and integral part of neurosurgical management. In this global war without any smoke, it is a pivotal need for a holistic effort, as a health unit, in combating the virus. In this new era of SARS-CoV-2, neurosurgeons must acknowledge the insights regarding neurocritical care to safeguard our patients and quest for their best possible clinical outcome, working in harmony and sync with other clinical specialties. SARS-CoV-2 has very similar properties to the already known SARS-CoV, demonstrating in animal models its ability to invade neural tissues, with a high preponderance to neurons in the respiratory centers. The exact cause must be differentiated from nonspecific causes from those caused valid or indirect way by the infection, including infectious, para-infectious, and post-infectious encephalitis, hyper-coagulable states prompting stroke. To improve the quality of life of patients, roping in of the neurological manpower is mandatory in ICU, ward, research as well as neurological, neuropsychological, and neurocognitive rehabilitation including domiciliary care in search of a SARS-CoV-2 free world.

Keywords: Neurocritical care, Trauma, Trauma surgery.

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Dear Editor,

Neurocritical care is an important and integral part of neurosurgical management. In this global war without any smoke, it is a pivotal need for a holistic effort, as a health unit, in combating the virus. In this new era of SARS-CoV-2, neurosurgeons must acknowledge the insights regarding neurocritical care to safeguard our patients and quest for their best possible clinical outcome, working in harmony and sync with other clinical specialties. Up to 20% of the patients have been seen to evolve to severe stages of the infection requiring intensive care support and management.[1] SARS-CoV-2 has very similar properties to the already known SARS-CoV, demonstrating in animal models its ability to invade neural tissues, with a high preponderance to neurons in the respiratory centers within the brain stem.[2] Exact cause must be differentiated from nonspecific causes (e.g., hypoxic encephalopathy and critical care neuropathy) from those caused valid or indirect way by the infection, including infectious, para-infectious, and post-infectious encephalitis, hyper-coagulable states prompting stroke.[3] With the growing evidence of the neuroinvasive potential of this virus, it is indeed established that the virus has CSF penetration, and is attached to the SARS-CoV-2 receptor ACE2 in the brain, where it acts as a cell surface peptidase present on the surface of endothelial cells and neurons.[4] Cerebral venous sinus thrombosis has got the fatal outcome. COVID patients presented with headaches with raised D-dimer, FDP, fibrinogen, and that is a strong predictor of cerebral thrombosis.[5] Understanding the pathophysiology of COVID-19 and its impact on treating the neurological function in critical patients, like thromboprophylaxis, high-flow oxygen/extracorporeal membrane oxygenation, airway management, infection control, etc., are some of those.[6] Age, sex, lymphocyte count, D-dimer, procalcitonin, brain natriuretic peptide, and respiratory support on SpO_2/FiO_2 were the prognosticators for critical COVID-19 patients.[7,8]

European Academy of Neurology (EAN) scientific panel neurocritical care, stressed four challenges of neurocritical care during SARS-CoV-2 pandemic viz. (A) Neuro-invasiveness and involvement of the respiratory centers at the lower brainstem including pons is linked in respiratory failure implicating tapping cerebrospinal fluid obligatory to assay SARS-CoV-2 RNA; (B) Role of neurocritical care came into the picture as most patients are kept in a prone position with intermittent or continuous administration of muscle relaxants during multi-organ involvement with neuro-co-morbidities like a seizure, encephalitis, and cerebrovascular events (ischemic stroke or intracerebral hemorrhage), multifactorial encephalopathy, neuropathy, and myopathy; also post ICU-care syndrome with cognitive impairment, physical and psychiatric disabilities are reported. (C) Neurocritical care of traumatic brain injury, ischemic and hemorrhagic stroke, status epilepticus, neuro-immunological diseases should get equivalence, keeping in mind emergent issues of neuro-invasiveness of this virus; critical approach should get priority in co-incidence and finding causality. (D) SARS-CoV-2 ICU survivors should be on long-term follow-up and neurorehabilitation in the presence of neurological complications, post-ICU syndrome; subacute neurological complications, including Guillain–Barre syndrome, necrotizing encephalitis, etc., need evaluation. Thus, to improve the quality of life of ICU survivors,

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roping in of the neurological manpower is mandatory in ICU, ward, research as well as neurological, neuropsychological, and neurocognitive rehabilitation including domiciliary care in search of a SARS-CoV-2 free world.[9]

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