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Management of Stroke During COVID-19 Pandemic: The Challenges in Nepal

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ABSTRACT

The COVID-19 pandemic has significantly affected health care delivery globally. COVID-19 is associated with varied neurological manifestations including acute ischemic stroke. In densely populated South Asian nations like Nepal that have suboptimal baseline health care systems, we foresee unique challenges during this pandemic to ensure effective stroke management as well as the safety of health care workers involved in the management of stroke patients.

Keywords: COVID-19; health care workers; safety; stroke management.

INTRODUCTION

The COVID-19 pandemic has devastated global healthcare delivery systems. As of August 25, 2020, it has affected 216 countries, infecting over 23 million people, and claiming more than 800,000 lives.[1]

COVID-19 is associated with a range of cerebrovascular complications including acute ischemic stroke.[2] Even before the pandemic, low and middle-income countries (LMICs) were grappling with a high burden of stroke, delayed presentation to the hospital, poor stroke management systems, limited availability of neuro-interventionalists, and financial constraints hindering timely thrombolysis and/or mechanical thrombectomy. Prevention and treatment services for all non-communicable diseases, including stroke, have been severely affected by the ongoing pandemic.[3] With the epicenter of the pandemic shifting from the affluent countries to LMICs, the 'stroke disaster' looms large in South Asian communities. Age-adjusted stroke mortality in South Asia was reportedly the highest among all developing regions.[4]As one-fifth of the world's population resides here, where quality healthcare services are lacking, South Asian nations like Nepal, are expected to be hard hit.

CHALLENGES AND THE SLIVER LINING

COVID-19 restrictions with lockdown measures are in place in several parts of South Asia. It seems many patients with stroke are presenting to the hospital late, beyond the typical window of thrombolysis, and seldom in the window for mechanical thrombectomy. The Government of Nepal had imposed a nationwide lockdown on March 22, 2020. In a single-center experience from a referral center in Kathmandu (Grande International Hospital) in the three months preceding the lockdown, 27 patients presented to the hospital with acute ischemic stroke, with 12 patients eligible for mechanical thrombectomy. The median time from symptom onset to hospital presentation was 6 hours. During the three months of lockdown, 18 patients with acute ischemic stroke presented to the hospital with only three patients eligible for mechanical thrombectomy. The median time from onset of symptoms to hospital presentation was 8 hours. None of the patients were COVID-19 positive. The scenario maybe even worse in rural regions. A recent report revealed similar findings with a decrease in stroke cases presenting to the hospital by nearly one-third, and up to 50% decrease in cases undergoing mechanical thrombectomy.[5] LMICs are under-represented in the survey, where the magnitude of the problem is likely higher. Failure to intervene on time will increase the stroke-related morbidity and mortality with a significant impact on the health care system.

We foresee numerous challenges for stroke management in LMICs. First, comprehensive stroke care is limited to a few urban hospitals, but the majority of the population lives in rural areas. For definitive treatment, stroke

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patients have to be transported to the nearest urban center, which may require several hours. Second, local policies may require obtaining a COVID-19 test for long-distance travel or before entering certain cities or states causing a significant delay in the transportation of patients. Third, very few specialty hospitals in South Asia were designed to handle an epidemic. In most hospitals, COVID-19 patients are managed with no proper infrastructure, inadequate resources, and limited staff. Even in most large central hospitals, there is a single radiology suite and cath-lab. The sharing of diagnostic and interventional facilities among the infected and non-infected patients is a logistical nightmare. A feasible option in Western countries is to expedite referral to designated stroke centers that have a comprehensive protocol for either thrombolysis or thrombectomy. There are recent recommendations that suggest designating stroke centers as COVID-19 ready stroke centers, with dedicated CT, MRI, and angiography suite exclusively for patients with stroke who are suspected or confirmed cases of COVID-19.[2] However, these guidelines are not applicable in low-income countries.

Increasing public awareness at the community level and integrating telemedicine projects for early diagnosis of COVID-19 patients with stroke may be useful to identify patients suitable for intervention at dedicated stroke centers while avoiding unnecessary transfer of other patients. There is a predilection for large-vessel occlusion in COVID-19 that typically requires mechanical thrombectomy. Though being challenging for LMICs, mechanical thrombectomy seems to be a viable option.[6]

While prompt stroke management should be the health care priority, ensuring the safety of health care workers is equally important. Health care workers involved in patient transport, emergency physicians, radiologists, neurologists, anesthesiologists, interventionalists, intensivists, nurses, and other technicians are at risk. They should be trained in safe patient transport, proper doffing and donning of personal protective equipment (PPE), and disinfection of the rooms and equipment. Hospitals need to set clear policies, educate health care workers, and provide certified PPE.

In the current scenario, it is important to modify stroke protocols to attain a balance between utilizing scarce hospital resources and ensuring the safety of health care workers. The stroke protocol may be different between the hospitals and has to be tailored to meet local needs, considering the availablility of resources and manpower. One such protocol, which we have been following, is proposed here.

Once the patient is received in the emergency unit, a single physician rapidly evaluates the patient and advises imaging evaluation as needed. We have extended our stroke imaging protocol to include computed tomography (CT) of the chest, CT-head, and CT angiography (CTA) of cerebral vessels. The majority of the therapeutic decisions can be made based on CT head and CTA, minimizing the need for emergency magnetic resonance imaging (MRI). If there is a diagnostic dilemma or in cases of a posterior circulation stroke, MRI can be done. Based on the assessment of the radiologist and the stroke physician, patients are grouped under high risk and low risk for COVID-19. If the patient has a history of close contact with COVID-19 patients, signs or symptoms suggestive of COVID-19, or has suggestive findings in the CT chest, all members of the medical team involved in the procedure would don full PPE during the procedure. If the patient has no suggestive history and has a negative CT chest, all members of the primary medical team use an N95 respirator, a face shield, and a surgical gown. A three layered surgical mask is placed over the face of the patient. Only one family member is allowed to attend the counseling sessions. During the procedure, only a limited number of health care workers are allowed in the cath lab, consisting of one neuro-interventionist, one anesthesiologist, one anesthesia assistant, one nurse, and one radiographer. After the procedure, oropharyngeal and nasopharyngeal swabs are sent for COVID-19 RT-PCR test, and the patient is shifted and kept in isolation until the reports of RT-PCR are obtained.

CONCLUSIONS

The unique scenario of LMICs, which have a different population demographic, fragile governance, inferior transportation, fewer resources, dissimilar healthcare needs, limited healthcare access, weak economies, and are at different stages of the pandemic deserve unique considerations. As the pandemic spreads rapidly in South Asia, countries like Nepal, are facing the challenge to find the right balance between effective management of stroke and the safety of health care workers.

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