**SUPPLEMENTARY DATA**

**Korean Nation-wide Survey (%)**

1. Please provide the name and location of the hospital where you work. (Hospital name/Hospital location)
2. What type of hospital are you working for?
   a. Tertiary medical institution: 72.6%
   b. Secondary medical institution: 27.4%
   c. Primary medical institution: 0%

**Practice**

1. Does your hospital perform COVID-19 tests on all patients when hospitalized through outpatient clinics for patients who need neurointervention or examination?
   a. Conducted for all patients: 54.8%
   b. Selectively performed for patients with symptoms: 43.5%
   c. Do not carry out: 1.6%
2. Does your hospital perform COVID-19 tests on all patients needing neurointervention or testing when hospitalized through the emergency room?
   a. Conducted for all patients: 54.8%
   b. Selectively performed for patients with symptoms: 45.2%
   c. Do not carry out: 0%
3. Does your hospital have a dedicated route for transferring suspected or confirmed COVID-19 patients from the emergency room to the cerebral angiography room?
   a. Yes: 17.7%
   b. No: 82.3%
4. Which of followings do you use for patients with suspected or confirmed COVID-19 in the cerebrovascular angiography room?
   a. Surgical (dental) mask: 88.7%
   b. N95 mask: 6.5%
   c. Powered air-purifying respirator (PAPR): 4.8%
5. How many masks are supplied by the hospital per person per day?
   a. 1: 59.7%
   b. 2: 25.8%
   c. 3: 9.7%
   d. 4 or more: 4.8%
6. In the cerebrovascular angiography room, do you put a mask on the patient during the procedure if the patient is a suspected or confirmed COVID-19 patient?
   a. Yes: 96.8%
   b. No: 3.2%
7. Is there a dedicated treatment room for patients with suspected or confirmed COVID-19 in the cerebrovascular angiography room?
   a. Yes: 91.9%
   b. No: 8.1%
8. Is there a negative pressure device in the cerebrovascular angiography room?
   a. Yes: 83.9%
   b. No: 16.1%
9. When the PCR test result of a suspected COVID-19 patient does not come out until the end of treatment, what does the medical staff do?
   a. Immediately do other tasks (operation, image interpretation, outpatient, etc.): 40.3%
   b. Wait in quarantine until the results of the test are available: 41.9%
   c. Even if it is not until results are obtained, a certain amount of time is taken before other tasks: 17.7%
10. Do you have two or more teams of medical treatment staff (doctors, nurses, radiologists) in preparation for the possibility that patients who has undergone treatment will test positive for COVID-19?
   a. Divided: 12.9%
   b. It cannot be divided by manpower or hospital circumstances: 72.6%
   c. Depending on the situation: 14.5%
11. Where is the intubation performed at your hospital when general anesthesia is required for emergency procedures for suspected or confirmed COVID-19 patients?
   a. In the cerebrovascular angiography room: 49.2%
   b. In a separate place with a negative pressure device: 24.6%
   c. In a separate place without negative pressure devices: 26.2%
12. After treatment of a suspected or confirmed patient of COVID-19, do you close the door of the cerebral angiography room and ventilate or disinfect before the next patient’s procedure?
   a. Yes: 93.5%
   b. No: 6.5%
13. How long is the time for ventilation and disinfection after treatment of suspected or confirmed COVID-19 patients?
   a. No ventilation or disinfection is performed: 6.6%
   b. 30 minutes: 23%
   c. 1 hour: 23%
   d. 1 hour 30 minutes or more: 47.5%

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14. Have you experience of treating a patient diagnosed with COVID-19 including a patient confirmed with COVID-19 after treatment?
   a. Yes: 1.6%
   b. No: 98.4%

15. Has there been a case of a medical staff (e.g., doctor, nurse, and radiologist) infected with COVID-19 due to a patient after surgery in the cerebrovascular angiography room?
   a. Yes: 0%
   b. No: 100%

16. How long does it takes for COVID-19 test in the emergency room?
   a. <1 hour: 1.6%
   b. 1–2 hours: 8.1%
   c. 2–24 hours: 85.5%
   d. >24 hours: 4.8%

17. For emergency patients who need neurointervention, is chest CT performed at the same time when brain CT is taken?
   a. This is done for all patients: 11.3%
   b. It is administered to patients suspected as having COVID-19, such as fever and respiratory symptoms: 74.2%
   c. Do not enforce: 14.5%

18. Do you perform chest X-ray for emergency patients who need neurointervention?
   a. It is performed for all patients: 83.9%
   b. It is administered to patients with suspected COVID-19, such as fever and respiratory symptoms: 14.5%
   c. Do not enforce: 1.6%

19. Do you think that you are wearing appropriate protective equipment when performing the procedure for a suspected or confirmed patient of COVID-19?
   a. Yes: 61.3%
   b. No: 38.7%

Impact of COVID-19 (13 questions)

20. What is the scope of the procedure currently being performed in your hospital?
   a. All procedures: elective, urgent, emergent cases: 100%
   b. Some procedures: urgent and emergent cases: 0%
   c. Emergency procedures only: 0%

21. Are there any ongoing studies of prospective design?
   a. Yes: 41%
   b. No: 59%  → Go to # 26

22. What kind of prospective studies are in progress?
   a. Stroke, Randomized Clinical Trial (RCT): 45.8%
   b. Stroke, Single arm: 45.8%
   c. Aneurysm, Randomized Clinical Trial (RCT): 0%
   d. Aneurysm, Single arm: 12.5%

23. Have there been any obstacles to continuing prospective design research due to COVID-19?
   a. Yes: 26.9%
   b. No: 73.1%  → Go to # 26

24. If there are any problems with the research, what kind of problems are there? (Multiple selection possible)
   a. Patient recruitment: 100%
   b. Follow up imaging: 0%
   c. Outpatient follow up: 14.3%
   d. Protocol deviation: 14.3%

25. Patient recruitment is
   a. Ongoing without delay: 44.4%
   b. Partially delayed: 55.6%
   c. On hold: 0%

26–32. This is a questionnaire on the changes between the first half of 2019 and the first half of 2020 related to emergency procedures.

26. The number of mechanical thrombectomy for ischemic strokes
   a. Increased by more than 25%: 5.1%
   b. Showed no change (<25%): 64.4%
   c. Decreased by more than 25%: 30.5%

27. The number of neurointervention for hemorrhagic strokes
   a. Increased by more than 25%: 5%
   b. Showed no change (<25%): 68.3%
   c. Decreased by more than 25%: 26.7%

28. The total number of emergency neurointerventions
   a. Increased by more than 25%: 4.8%
   b. Showed no change (<25%): 61.3%
   c. Decreased by more than 25%: 33.9%

29. Do you perform mechanical thrombectomy under general anesthesia?
   a. It is carried out for all patients: 93.5%
   b. Rarely but depending on the patient’s condition: 3.2%
   c. It is not performed: 3.2%  → Go to #31

30. If you perform mechanical thrombectomy under general anesthesia, the incidence of general anesthesia due to COVID-19
   a. Increased by more than 25%: 0%
   b. Showed no change (<25%): 100%
   c. Decreased by more than 25%: 0%
31. If there is a decrease in the total number of neurointerventions due to COVID-19, when do you expect to re-commence to full capacity with non-emergency procedures?
   a. Already recovered (or never decreased): 43.5%
   b. Within 6 months: 22.6%
   c. 6 months to 1 year: 12.9%
   d. Over 1 year: 11.3%
   e. No idea: 9.7%

32. Do you have any mental or psychological symptoms during treatment in the era of COVID-19? (Multiple answers available)
   a. None: 51.6%
   b. Depression: 32.3%
   c. Insomnia: 3.2%
   d. Anxiety: 27.4%
   e. Others: 0%