

COMMENTARY

Acute stroke care during the COVID-19 pandemic

The outbreak of the coronavirus (COVID-19) pandemic has led to a global public health crisis, with a significant impact on different aspects of healthcare performance including acute stroke management.

The introduction of various restricting measures to contain the spread of COVID-19 has greatly impacted stroke management pathways. Studies from many European and North American countries have reported a significant decline, from 50% to as much as 80%, in number of patients admitted to stroke units [1]. This decrease was mainly related to patients with clinical presentation of transient ischemic attack and minor stroke, whereas admissions of patients with severe stroke did not decrease [2,3]. Furthermore, a significant reduction of telemedical and telemedical stroke consultations has been reported during the initial lockdown pandemic period [4]. It has been pointed out that patients themselves, as well as the physicians who treated them, were often hesitant to go to the hospital due to the fear of infection. The hospitals were often perceived as nonsecure places where high-risk patients (e.g., elderly, diabetic, hypertensive, obese) could contract COVID-19 [2,3,5].

Timely reperfusion is an important goal in the treatment of acute stroke. However, the early initiation of reperfusion therapy depends on the optimal functioning of prehospital and hospital chains that have been impacted by the COVID-19 pandemic. A study conducted in several European countries, as well as in Canada and the United States, has reported a significant reduction of 32% ($p < 0.001$) in performed endovascular procedures and an increase of 54 min ($p < 0.001$) in symptom onset to groin puncture time after the introduction of restriction measures in response to the COVID-19 pandemic [6]. A French national study, with 32 participating centers, has also reported a significant decline of 21% for mechanical thrombectomy (MT) procedures performed after the implementation of the restrictive measures (0.79; 95% confidence interval: 0.76–0.82; $p < 0.001$), and a significant increase between imaging and groin puncture time (mean 144.9 ± 86.8 SD min versus 126.2 ± 70.9 SD min; $p < 0.001$), compared to the same calendar period in 2019 [7]. The study also emphasized an initial weak negative correlation between the total number of hospitalized COVID-19 patients and the number of performed MTs ($R^2 = -0.27$, $p = 0.07$ for the comparison with 0), which then strengthened ($R^2 = -0.51$) and became significant ($p = 0.04$) after the confinement measures were set [7]. The question of the impact on administration of intravenous thrombolysis (IVT) has also been an issue. A German national study investigating the effects of the COVID-19 pandemic on telemedical care reported a

nonsignificant trend toward a lower proportion of IVT recommendations ($p = 0.052$) [4]. Furthermore, a significant decrease for administered IVT has been reported in Italy (26%) [3], China (26.7%, $p < 0.0001$) [5], and France (43% vs. 51%, $p = 0.029$) [7] compared to nonpandemic periods. Various potential explanations have been proposed, such as patients' late arrivals to the hospital, lengthening of intrahospital delays, and physicians' preference for primary thrombectomy [3,5,6]. Unequivocally, the screening process for COVID-19 has significantly impeded the stroke care process. Various chain components (e.g., onset-to-door, door-to-needle time) were negatively impacted by unavoidable epidemiological screening, relevant examination, as well as personnel protective measures for COVID-19 [5]. Another aspect that has also been observed is the reduction/cessation in stroke education for the public conducted by stroke centers, which has an additional unfavorable impact on stroke awareness education [5]. In the attempt to overcome the challenges and contribute to potential solutions, several protocols for stroke care during the COVID-19 pandemic were recommended [3,5,8].

The onset of the COVID-19 pandemic and the measures taken to prevent spreading of the disease have led to side effects on medical care for other calamitous diseases. Acute stroke management has been influenced both directly and indirectly. The common denominator of the results of numerous published studies refers to patients' delayed arrival or nonarrival to hospitals for various reasons, with a consequential impact on administration of reperfusion therapies. Undoubtedly, proper stroke awareness has never been more important than during the current pandemic. In summary, healthcare systems have made efforts to appraise and readjust to the new reality. However, the continuous sharing of experience is necessary to further reduce the undesired impacts on whole aspects of medical care.

CONFLICT OF INTEREST

Visnja Padjen travel or speaker honoraria from Boehringer Ingelheim and Pfizer; honoraria from scientific advisory board from Medtronic.

AUTHOR CONTRIBUTIONS

Visnja Padjen: Conceptualization (equal); data curation (equal); formal analysis (equal); funding acquisition (equal); investigation (equal); methodology (equal); project administration (equal); resources (equal); software (equal); supervision (equal); validation (equal); visualization (equal); writing—original draft (equal); writing—review & editing (equal).

DATA AVAILABILITY STATEMENT

The data that support the content of this manuscript are available from the corresponding author, upon reasonable request.

Visnja Padjen 

Neurology Clinic, Clinical Centre of Serbia, Faculty of Medicine,
University of Belgrade, Belgrade, Serbia
Email: visnja.padjen@hotmail.com

ORCID

Visnja Padjen  <https://orcid.org/0000-0002-6126-8305>

REFERENCES

1. Markus HS, Brainin M. COVID-19 and stroke – A global World Stroke Organization perspective. *Int J Stroke*. 2020;15(4):361-364.
2. Butt JH, Fosbøl EL, Østergaard L, et al. Effect of COVID-19 on first-time acute stroke and transient ischemic attack admission rates and prognosis in Denmark: a nationwide cohort study. *Circulation*. 2020;142(12):1227-1229.
3. Baracchini C, Pieroni A, Viaro F, et al. Acute stroke management pathway during Coronavirus-19 pandemic. *Neurol Sci*. 2020;41(5):1003-1005.
4. Vollmuth C, Miljukov O, Abu-Mugheisib M, et al. Impact of the COVID-19 pandemic on stroke teleconsultations in Germany in the first half of 2020. *Eur J Neurol*. 2021.1-12.
5. Zhao J, Li H, Kung D, Fisher M, Shen Y, Liu R. Impact of the COVID-19 epidemic on stroke care and potential solutions. *Stroke*. 2020;51(7):1996-2001.
6. Hajdu SD, Pittet V, Puccinelli F, et al. Acute stroke management during the COVID-19 pandemic: does confinement impact eligibility for endovascular therapy? *Stroke*. 2020;51(8):2593-2596.
7. Kerleroux B, Fabacher T, Bricout N, et al. Mechanical thrombectomy for acute ischemic stroke amid the COVID-19 outbreak: decreased activity, and increased care delays. *Stroke*. 2020;51(7):2012-2017.
8. Lyden P, on behalf of the AHA/ASA Stroke Council Leadership. Temporary emergency guidance to US Stroke Centers during the Coronavirus Disease 2019 (COVID-19) pandemic: on behalf of the American Heart Association/American Stroke Association Stroke Council Leadership. *Stroke*. 2020;51(6):1910-1912.