

IMPACT ON EMERGENCY NEUROLOGY DEPARTMENT VISITS IN PRE-COVID-19 AND COVID-19 PERIOD. A SINGLE TERTIARY CENTER STUDY

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Dear editor,

The World Health Organization declared the severe acute respiratory syndrome coronavirus 2 (SARS-COV-2) outbreak a pandemic on March 11, 2020. Consequently, the Croatian Ministry of Healthcare designated University Hospital Dubrava as the primary respiratory intensive center for the treatment of SARS-COV-2 patients from seven administrative regions of central and northwestern Croatia (Peršec 2020). This study aims to assess the impact on emergency neurology department visits after University Hospital Dubrava became the primary respiratory intensive center for the treatment of SARS-COV-2 patients.

A retrospective record review study was conducted at emergency neurology department of the University Hospital Dubrava Zagreb and approved by the research ethics committee of University Hospital Dubrava Zagreb. To determine the impact of the COVID-19 pandemic, we evaluated the patients assessed between 1-31 August 2020. It is important to emphasize that during this period hospital was available to all patients who needed medical care, not just to the ones who had COVID-19. Data on the patients observed between 1-31 August 2018 were also collected to provide a control group. Medical records included demographic data, the reason for the visit, methods of patients referral to ED, number of performed computed tomography brain scans, number of hospitalized patients as well as most common reasons for hospitalisation. We also recorded number of patients who were tested and diagnosed with COVID-19 in August 2020. The differences between groups were tested using the one-tailed independent-samples t-test. The significance threshold was set at 0.05.

In this study, 840 patients were included: 358 patients from the pandemic period and 482 patients from the non-pandemic period. During the COVID-19 outbreak in Croatia in 2020, we found a significant decrease in the daily number of patients presenting at the ED with neurological complaints (M=11.55, SD=3.98) compared to the control group (M=15.42, SD=4.66), $t(60)=3.52$, $p<0.001$. Other significant results include a smaller share of female patients during COVID-19 period (47.4% during pandemics vs 55.8% before pandemics). We also witnessed a

significant smaller proportion of daily self-referred patients to the ED during COVID-19 period (M=5.97, SD=2.51) vs (M=8.71, SD=3.62), $t(60)=3.46$, $p<0.001$, while a number of patients referred by general practitioner or brought in by ambulance was not significantly different. During the COVID-19 period compared to the same time in the year 2018, there was also statistically significant daily decrease in the number of patients who came to ED due to back pain (M=2.74, SD=2.17) vs (M=4, SD=2.13), $t(60)=2.3$, $p=0.012$, general weakness (M=0.13, SD=0.42) vs (M=0.35, SD=0.49), $t(60)=1.94$, $p=0.028$, syncope (M=0, SD=0) vs (M=0.16, SD=0.37), $t(60)=2.4$, $p=0.009$, dizziness (M=2.1, SD=1.19) vs (M=2.87, SD=2.04), $t(60)=1.82$, $p=0.037$, balance disturbance (M=0.1, SD=0.4) vs (M=0.58, SD=0.76), $t(60)=3.13$, $p=0.0013$. Number of patients who were hospitalized due to stroke, transient ischemic attack, intracerebral hemorrhage, and epilepsy was not significantly different between non-pandemic and pandemic period. During the pandemic period we found a significant decrease in the overall number of performed CT brain scans (M=7.06, SD=2.57) vs (M=9.06, SD=3.46), $t(60)=2.58$, $p=0.006$. During August 2020 sixteen patients were tested and only one was SARS-CoV-2 positive. As was seen in other studies, there was a statistically significant drop in self-referred patients to the ED. This may be due to public concern of being exposed to the virus in the health institution (Weber et al. 2017). Our assumption is that when patients had symptoms that were not life threatening, fear of being exposed to virus prevented them from coming to ED. Furthermore, our assumption is that the patients were additionally refrained from coming to the ED University Hospital Dubrava because this hospital was specially assigned to treat patients with COVID-19, the fact that presumably raised additional concerns and fear among patients about safety of such visit in terms of exposure to virus and limitation of availability of healthcare services within hospital. Patients define situations worthy of 'emergency' ambulance use according to complex socioemotional factors, as well as experienced physical symptoms (Booker et al. 20017). The conditions requiring urgent ED and neurological intervention as well as hospitalisation were not significantly different between non-pandemic and pandemic period which highlights the availability of healthcare resources in our area during healthcare crisis.

To conclude, there was a reduction in patient visits to the emergency department in the period of the pandemic. To the best of our knowledge this is the first study to demonstrate the trends of ED attendance of patients with neurological complaints after one tertiary center was designated as the primary respiratory intensive center for the treatment of SARS-COV-2 patients. The extent to which the pandemic affects hospital ED attendance can help healthcare professionals prepare for future such events.

Limitations: The study is limited by its focus on a single hospital.

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Conflict of interest: None to declare.

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