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EAN REVIEW

A plea for equitable global access to COVID-19 diagnostics, vaccination and therapy: The NeuroCOVID-19 Task Force of the European Academy of Neurology

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Abstract

Coronavirus disease 2019 (COVID-19), a multi-organ disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), continues to challenge health and care systems around the globe. The pandemic has disrupted acute neurology services and routine patient care and has impacted the clinical course in patients with chronic neurological disease. COVID-19 appears to have exposed inequalities of societies and healthcare systems and had a disproportionate impact on already vulnerable communities. The next challenge will be to set up initiatives to stop disparities in all aspects related to COVID-19. From the medical perspective, there is a need to consider inequalities in prevention, treatment and long-term consequences. Some of the issues of direct relevance to neurologists are summarised. With this appraisal, the European Academy of Neurology NeuroCOVID-19 Task Force intends to raise awareness of the potential impact of COVID-19 on inequalities in healthcare and calls for action to prevent disparity at individual, national and supranational levels.

KEYWORDS
advocacy, COVID-19, disparity, equitable global health, neurology, primary prevention, SARS-CoV-2

INTRODUCTION

Coronavirus disease 2019 (COVID-19), a multi-organ disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), continues to challenge health and care systems around the globe. In only 12 months since the report of the index case in Wuhan, China, the pandemic has resulted in more than 83.2 million confirmed cases and 1.8 million deaths worldwide.[1] From a neurological perspective, the pandemic has not only disrupted acute services but also routine patient care, through limited provision of resources and hospital avoidance behaviour.[2] Even in the absence of SARS-CoV-2 infection, people with chronic neurological conditions including dementia, Parkinson´s disease and epilepsy currently have a higher risk of clinical progression and complications.[3–8] The disruptions to patient care and consequent mental distress are considered potential trigger factors for this observation.[9,10]

INEQUALITIES EXPOSED BY COVID-19: GENERAL ASPECTS

COVID-19 appears to have exposed inequalities of societies and healthcare systems and had a disproportionate impact on already vulnerable communities. There is an increasing body of evidence that the pandemic continues to have the heaviest impact on the lives of people living in difficult socioeconomic circumstances. The incidence and mortality of COVID-19 are also disproportionately higher in certain ethnic minority groups, both in the United States and Europe. In London, Asian people had higher odds of death from COVID-19 compared to White people.[11] In another study from the United Kingdom, Black and Asian individuals had a greater than four- and two-fold increased risk of COVID-19 infection, respectively, compared to White study members.[12] In a study from Barcelona, the incidence of COVID-19 showed an inverse association with mean income.[13] Data from the Stockholm region revealed higher COVID-19 mortality in young and socially vulnerable populations.[14] Migrants and refugees are among the vulnerable groups, many of whom have to live, travel and work in conditions where physical distancing and recommended hygiene measures are essentially impossible because of poor housing conditions and economic precarity.[15] The World Health Organization (WHO) anticipates that people who have both COVID-19 and other infectious diseases such as tuberculosis (TB) may have poorer treatment outcomes.[16] This hypothesis is generated from the assumption that a lower detection rate for TB during the pandemic can be expected, which may translate into a higher rate of TB-related deaths. Non-communicable diseases are also highly prevalent in refugee populations, such as type 2 diabetes mellitus, and are known to increase the risk for severe COVID-19.[17]

Moreover, there are consistently higher intensive care unit (ICU) admission and fatality rates in male COVID-19 patients.[18] Genetics, immunological responses and hormonal mechanisms may play a role, and sociocultural factors such as smoking and handwashing rates have also been postulated.[19,20]

NEUROLOGICAL MANIFESTATIONS OF COVID-19

There is increasing evidence that SARS-CoV-2 infection can also affect the nervous system.[21,22] In a prospective study of 239 people with COVID-19 from Turkey, 34.7% had neurological symptoms.[23] Headache, myalgia, anosmia, ageusia, impaired consciousness and psychomotor agitation were the most frequent neurological findings in COVID-19 patients according to an international survey conducted by the European Academy of Neurology (EAN).[24] COVID-19-associated encephalopathy and cerebrovascular disorders are further neurological manifestations, and are associated with unfavourable short-term outcomes compared to age- and sex-matched historical non-COVID-19 cohorts.[25–27] Additional complications include para- and postinfectious disorders (e.g. Guillain-Barré syndrome, acute disseminated encephalitis) and neuroinvasive disease.[28,29] The latter is characterized by neuronal injury in the presence of SARS-CoV-2 replication in the central nervous system (CNS) and a local inflammatory response.[30] Of note, a case of COVID-19 meningitis without pulmonary involvement has been reported.[31] Several studies demonstrated an increased risk of secondary neurological complications in hospitalized patients with COVID-19.[32,33] Moreover, biomarkers for CNS injury in cerebrospinal fluid (CSF) are elevated in COVID-19 and associated with neurological symptoms and disease severity.[34]

The underlying biology of COVID-19 with extensive inflammation predicts that longer-term neurological manifestations are to be expected, especially in older individuals and people susceptible to autoimmune disease. Longer-term consequences of NeuroCOVID-19 are being researched; further insights are expected from international registries such as ENERGY, a database set up by the EAN.[35]

INEQUALITIES REVEALED BY COVID-19: RELEVANCE FOR NEUROLOGY

The Global Burden of Disease 2017 study disclosed that neurological disorders are the third most common cause of disability and premature death in the European Union.[36] Advanced age and comorbidities are significant risk factors for COVID-19-related fatality.[37,38] Many diseases of older age are neurological disorders, and elderly patients have a higher likelihood of pre-existing medical conditions. People with neurological disorders have more severe COVID-19 and higher mortality.[39,40] Thus, the sheer number of patients at risk for unfavourable outcomes from COVID-19 based on age and comorbidities underpins the importance of neurology in the multidisciplinary care of these patients.[41] Maintenance of acute neurology services, inpatient and outpatient care, and neurorehabilitation are needed more than ever. However, during this unprecedented public health crisis, these services are vulnerable and disruption may have a disproportionate impact on certain groups.[42] In Greece, hospitalization for acute stroke and acute coronary syndrome declined during the first wave of the pandemic, indicating medical care avoidance behaviour.[31] In Slovakia, the analysis of the nationwide stroke registry revealed a fall in the number of stroke patients, which did not translate in a drop in the quality of acute stroke care compared to pre-COVID-19 times.[43] In contrast, the overall incidence of stroke remained unchanged in the French Alsace region, but fewer patients presented within the therapeutic time window.[44] In Northwest Spain, a decrease in the number of patients benefiting from reperfusion therapies was found, with a delay in out-of-hospital and door-to-needle times.[45] A similar finding was reported from Hungary.[46]

Reports that outpatient clinics, neurology wards and rehabilitation facilities were either closed, reduced in capacity, or shifted toward people recovering from respiratory infection are worrying.[47] Remote consultation can bridge gaps in outpatient care in some neurological subspecialties.[48] Diagnosing neurological diseases is often dependent on physical neurological examination. As video conferencing and smartphone technologies have improved tremendously, even parts of the neurological examination can be applied via video consultation.[49,50] It needs to be considered, however, that technical equipment may not always be available at hub sites, virtual consultation unavailable due to lack of reimbursement, or in-house priorities shifted towards acute care of COVID-19 patients. Moreover, the necessity of familiarity with the technology means that problems may arise for some groups, for example, older people.[51] These problems might be exacerbated if family members are unable to assist because of the necessity of social distancing. Availability of digital infrastructure and literacy is also related to socioeconomic status, so this represents another area where measures need to be considered to avoid discrimination.[52]

Isolation can result in psychological distress among patients, families and healthcare staff. In a study from London, patients reported emotional, cognitive and physical concerns, and greater vulnerability to isolation and economic hardship.[10] Families and carers reported increased distress arising from hospital lockdown. Healthcare workers reported distress, anxiety and reduced social support. Elderly people may also face discrimination. In a study from Israel, societal views of older adults were studied; perceptions of vulnerability and burden to society during the COVID-19 outbreak were reported.[53] There might be a shortage of mobile nurses for people who require care at home. Moreover, discharge to long-term care homes after a hospital stay for COVID-19 or other reasons may be delayed not only by limited nursing capacity but also by the fear of infecting nursing home residents and healthcare staff despite negative testing.

The pandemic has also disrupted residency programmes due to a relocation of manpower and reduction of capacity for outpatient service and at wards. A survey from the Resident and Fellow Section of the EAN revealed that 79% of the respondents felt that

the pandemic will likely have a serious impact on their training and career.[54]

Evidence-based guidelines from scientific societies or government bodies should support identification of medical standards avoiding such inequities. However, evidence is sparse in a situation facing a new disease within a pandemic. Few recommendations were developed with urgency to address this shortfall including the EAN recommendations for management of patients with neurological diseases during the COVID-19 pandemic.[55] Many of the above issues are addressed in these recommendations.

ACCESS TO COVID-19 DIAGNOSTICS, VACCINATION AND THERAPY: STOPPING INEQUALITY BEFORE IT HAPPENS

The pandemic caused an acute shortage of essential supplies. The WHO has established a COVID-19 supply chain system to fill gaps, ensure quality and help countries navigate supply issues.[56] In addition to efforts directed at promoting information campaigns about COVID-19, the WHO provided technical support, virtual training, equipment and supplies to boost testing capacity around the world.

In low- and middle-income countries, the direct and longer-term socioeconomic consequences of the pandemic may be even more extensive due to fragility of pre-existing healthcare systems and shortage of resources.[57] The next challenge will be to set up initiatives to stop inequality in all aspects related to COVID-19. From the medical perspective, there is a need to consider disparities in prevention, treatment and long-term consequences. Here, we provide a brief summary of considerations. We acknowledge that this list is incomplete, needs to be adapted to circumstances, and may not be applicable in every setting.

1. The public health strategy of flattening incidence curves by primary prevention is a multifaceted process. Timely diagnosis of individuals with COVID-19 requires unrestricted and widespread access to appropriate diagnostic testing. To prevent inequitable access to testing, neighbourhoods in lower-income areas and communities with high proportions of ethnic minority residents and refugees may need to be actively prioritized for mass testing. Limited health literacy has the potential to undermine efforts to reduce viral transmission, as reported in a study from Australia.[58] People with low health literacy had poorer understanding of COVID-19 symptoms, were less able to identify behaviours to prevent infection, and experienced more difficulty finding information and understanding government messaging about COVID-19. Outreach schemes should be combined with educational initiatives regarding the importance of COVID-19 testing.
2. Isolation of individuals diagnosed with COVID-19 and identification and quarantine of close contacts is another key step. For people living in challenging socioeconomic circumstances, sick leave, quarantine and COVID-19 in family members has far greater consequences. This disproportionate impact can be expanded to issues such as home schooling. Moreover, people with lower income are more likely to experience overcrowding in their household,[59] posing a greater infection risk, especially if different generations cohabit together. Lower income may also be associated with higher SARS-CoV-2 transmission risks, for example, through reliance on public transport or through occupation.[60] Indeed, differences in the ability to reduce mobility and visiting more crowded points of interest may also account for higher infection rates in disadvantaged racial and socioeconomic populations.[61] Researchers from Oxford, United Kingdom forecasted substantial and uneven wage losses all around Europe by COVID-19-related lockdown and social distancing periods.[62] They expressed concerns that poverty and wage inequality will rise in all European countries in the absence of compensating policies. Inequity in accessing healthcare services and healthy nutrition will be further consequences. Fully addressing these disparities is beyond the scope of this article.
3. Face masks combined with other preventive measures, such as frequent hand-washing and physical distancing, help to slow viral transmission.[63] In East Asia, mask-wearing to prevent the spread of infectious disease is commonplace. In Europe and North America, however, their use has been stigmatized for a long time. Face coverings have been associated with assuming a different identity, avoiding recognition, to exhibit modesty, having an infectious disease, and for cultural ceremonies.[64] Masks are costly and a limited supply of masks has been observed since the beginning of the pandemic. In November 2020, Spain, which has the second highest number of cumulative infections in Western Europe, reduced the value-added tax for masks to make them more affordable.[65] If mask costs need to be covered by individuals, differences in risk of contracting SARS-CoV-2 are predictable based on socioeconomic status. A study from Italy reported that community knowledge about the use, reuse, disinfection and disposal of masks is in need of improvement.[66] Thus, it is mandatory to facilitate unlimited access to and educate the use of masks.
4. Lockdown periods are public health measures proven to reduce viral transmission through reduced human interaction.[67] Such drastic measures need to be accompanied by appropriate information campaigns. Groups with lower health and technological literacy may require particular attention.
5. COVID-19-related social stigma make this challenging situation even worse, resulting in more severe health problems and difficulties controlling a disease outbreak.[68] Stigma can result in hiding illness to avoid discrimination, prevent people from seeking timely healthcare and discourage adoption of healthy behaviours. A large global study revealed that healthcare workers are significantly more likely to experience COVID-19-related stigma and bullying, often in the context of racism, violence and police involvement in community settings.[69]
6. There is legitimate hope that a COVID-19 vaccine will bring the pandemic under control, when combined with appropriate mass

testing and existing behavioural and non-behavioural prevention measures.[70] When it comes to distributing COVID-19 vaccines,[71] the major challenge will be to prevent the inequality gaps the pandemic has exposed from widening. The decision as to whom to vaccinate first is a complex public health issue. In some settings, elderly people and people with comorbidities are being prioritized. In other settings, it may be populations most likely to become infected or more likely to be responsible for community spread who would be targeted.[72] Demand for COVID-19 vaccines is likely to far exceed supply initially. More than 10 billion vaccines doses have been pre-ordered and distribution has started. The 27 member states of the European Union together with five other countries account for about half of this order.[73] Notably, these countries account for only around 13% of the global population. COVAX, a global alliance seeking to ensure that low- and middle-income countries get adequate vaccine provision, has been able to secure vaccines for only around 250 million people.[74] Considering anti-vaccine campaigns, clear communication on the basis for regulatory decisions including clinical trial and surveillance data will be necessary to provide clarity on advantages and safeguards in place and avoid the spread of "fake news". To some extent, scepticism towards vaccination may be cultural.[75] Appropriate explanation of potential risks and uncertainties needs to be tailored to individual groups. Lessons have been learned from polio, tuberculosis and measles vaccination campaigns, for which it is notable that unequitable distribution was a major reason for lack of complete eradication.[76]

7. The discussion on a global strategy for equitable access to vaccination needs to be extended to the care of people infected with SARS-CoV-2. The major challenge will be to ensure equality of access, especially in countries without universal health coverage. There is a risk that costs associated with diagnosis and treatment of COVID-19 could further intensify disparities. For example, established anti-inflammatory or antiviral therapy for SARS-CoV-2 infection confers costs and emerging treatments such as monoclonal antibodies or convalescent sera, if they were to prove effective in trials, higher costs still. This consideration needs to be extended to non-restricted access to hospital beds, intensive care unit and ventilators, and rehabilitation services.
8. Criticism has been voiced against the formulation and implementation of "ageist" policy, whereby resources are prioritized based exclusively on patients' chronological age.[77] Older people from lower-income backgrounds are more likely to suffer from chronic conditions, multimorbidity and frailty. Older people from minority or disadvantaged groups may therefore face double discrimination, placing them in an extremely vulnerable situation. Self-isolating older adults are more likely to experience loneliness, difficulties obtaining food for a balanced diet, lack of exercise, and lower cognitive stimulation. These factors may considerably decrease their levels of resilience, leading to a cascade of physical and mental health problems, exacerbated by challenges maintaining social care and community support.

CONCLUSIONS

The COVID-19 pandemic has exposed various social determinants of health outcome and has hit already disadvantaged groups in a profound and disproportionate fashion. Lessons from previous epidemics and the current pandemic reinforce the need to implement mitigation measures. Some of the issues of direct relevance to neurologists are outlined in this review. With this appraisal, the EAN NeuroCOVID-19 Task Force intends to raise awareness of the potential impact of COVID-19 on inequalities in healthcare and calls for action to prevent disparity at individual, national and supranational levels.

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CONFLICT OF INTEREST

None.

DATA AVAILABILITY STATEMENT

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