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Title: Neurology training and research in the Covid-19 pandemic: A survey of the Resident and Research Fellow Section of the European Academy of Neurology

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Abstract

Introduction: The COVID-19 (SARS-CoV2) outbreak has disrupted residency programs due to the university and hospital's priorities to face this emergency at all expenses. Most research projects and clinical trials were temporarily stopped or postponed. The Resident and Research Fellow Section (RRFS) of the European Academy of Neurology (EAN) has decided to assess the impact of the COVID-19 pandemic on neurology training.

Methods: All EAN RRFS members were invited to fill out an online questionnaire of 40 items concerning their clinical involvement during the COVID-19 emergency, and the impact of the pandemic on their training.

Results: Of the 227 RRFS members who completed the questionnaire, 222 were from Europe, and from those 111 were from Portugal, Italy or France. Responders highlighted that severe restrictions have been amended to face this pandemic, including reduction of inpatient beds, prohibition of in-person visits and limitation to hospitals access for patients' relatives. This was accompanied by an increase in email correspondence and phone calls with 50 % of countries allowing telemedicine to reach outpatients. Seventy-nine percent of the respondents felt that the pandemic will likely have a serious impact on their training and career.

Conclusion: The pandemic lead to a disruption of neurology activities, including medical training and research. The long-run impact of these changes remains unknown, but it will likely change the way neurology practice and training will be organized for future generations.

Introduction

The COVID-19 (SARS-CoV-2) pandemic reached Europe early at the beginning of 2020¹. To date, this pandemic has affected over 3 million European citizens, and the number is still increasing (<https://www.ecdc.europa.eu/en/covid-19-pandemic>). This has overturned most healthcare systems and altered healthcare priorities worldwide. The neurological burden of COVID-19 is still unknown, as well as whether patients with chronic neurologic disorders have a higher risk of severe infection^{2,3}.

The global consequences of this pandemic are enormous. From the educational point, most programs and clinical research have been heavily affected⁴. Universities have struggled to maintain teaching and research activities, and have adapted in several ways, mainly developing webinars, videoconferences, online courses, and virtual congresses⁵. However, the real burden of this pandemic on European neurology residents and research fellows remains largely undetermined⁶.

We conducted an online survey between the Resident and Research Fellow Section (RRFS) members of the European Academy of Neurology (EAN) with the aim of obtaining an overview of the changes in neurological practice and investigating the main aspects of the impact of COVID-19 on neurology trainees and residents throughout Europe.

Methods

Participants

All registered EAN-RRFS members received an e-mail with an invitation to participate in a cross-sectional study through an online survey.

Questionnaire

The questionnaire used Google Forms and comprised 40 items organized in four parts: 1. National government response; 2. Health care system response; 3. Changes in the medical care of neurology patients; 4. Impact of the pandemic on their training and research activities. The questionnaire remained available from 29th of April until 25th of August 2020.

Statistical analysis

All returned questionnaires were checked manually to clean the database from missing queries or answers. Data analysis was conducted on MS Excel software. Baseline analysis was performed using descriptive statistics, namely mean or median and standard deviation or interquartile range for continuous variables and absolute numbers and percentages for categorical variables.

Results

Out of 1493 potential responders, 227 members (15%) fully completed the questionnaire.

Demographic data is shown on table 1.

Part 1. National government response

Nearly all responders answered that in their own country an Emergency State was declared, often including an official lockdown.

Part 2. Health systems response

Most responders stated that restrictions and/or modifications were put in place by the Local/National Health Departments. These restrictions mainly related to enter the hospital facilities (e.g. relative's visits) and the cancellation of programmed admissions. Moreover, neurology wards often merged with other units to rearrange the facilities to accommodate COVID-19 patients or Intensive Care Units (ICU). Disruptive changes have been reported about the outpatient sector and day hospital activities (Table 1).

Part 3. Medical care of neurology patients

Concerning the neurology wards, responders stated a reduction in inpatient beds as the most important change. Regarding work safety conditions, 38% reported they did not have enough personal protective equipment.

Regarding the outpatient clinic, 55% declared an increase of e-mail correspondence with patients, and 88% an increase in telephonic evaluation of patients.

Concerning the use of telemedicine, half of the responders used it as alternative approach to reach outpatients, but only 28% reported this as a licensed/official service. The perceived main challenges were legal concerns (60%) and the ability of patients to perform a video call (58%).

Finally, participants felt that the care of neurologic patients was compromised, mostly due to the postponement of appointments of outpatients (72%), and fewer diagnostic procedures being performed (65%).

Part 4. Residency program and research activities

Most neurology residency programs have been modified. From the 59% who declared they had classes/educational activities; these were interrupted in 53% of cases. Many responders reported either an important reduction in the time spent with patients, or in their supervision of their work. Regarding scientific activities and meetings, 88% of the responders reported that they were forbidden to attend any in-person meetings, 82% the temporary suspension of all research activities (both clinical and laboratorial), and 48% the temporary suspension of any drug trials.

Among responders, 62% reported research activities during their residency program being 56% altered due to the pandemic, mainly due to the impossibility to conduct in-person visits (50%). In the PhD students/research fellows' group, 62% reported temporary suspension of their research project, while 20% had to suspend or postpone planned fellowship, and 17% had to stop their fellowship.

When asked whether they felt this pandemic would impact on their training and career, 79% gave a positive answer. Additionally, 65% of responders reported that these changes had important consequences on their emotional status. Regarding psychological help, 49% stated that psychological support was available in their hospital/university, but in 18% this was provided on a voluntary basis by a psychiatrist or psychologist.

Finally, regarding the direct involvement in the management of patients with COVID-19, 56% stated that residents were called to help in COVID-19 Units, although 58% felt they were not ready to manage critical patients.

Discussion

The COVID-19 pandemic has caused an enormous impact on health systems worldwide, and the Neurology Departments have not been an exception. However, the impact of this pandemic on neurology residents, more frequently the first-line workers, remained largely unknown⁷.

Our survey among EAN-RRFS members elucidates some of these consequences. Most European Health Departments put in place severe restrictions (e.g. cancellation of programmed admissions) that residents perceived as compromised care of neurologic patients, especially due to the block of the outpatient sector. Furthermore, residents were overall interested in the increased use of telemedicine, which has been used to reach outpatients by half of responders. Residents declared classes interrupted, reduction in time spent with patients and contraction in supervision of their works. Furthermore, over half stated a mild-to-severe impact on their research projects.

Neurology care is mostly based on face-to-face engagement with patients and many patients with chronic neurological diseases need a regular follow-up. Therefore, COVID-19 pandemic has been extremely challenging for neurological patients and their caregivers. In our survey, data shows that reduction of inpatient beds and the temporary suspension of the outpatient sector were the main reactions to face this emergency. Furthermore, there was a wide reduction in diagnostic procedures performed, such as neurophysiological tests, whose performance and interpretations are crucial steps both for the neurology practice and the neurologist training.

A shift in the care of neurologic patients has been perceived by almost all the participants, despite the increase of email and phone calls use or the telemedicine approach to reach outpatients. The latter has been largely debated and several studies have been published since the COVID-19 outbreak. A recent review on neurological impact of COVID-19 provided recommendations to manage neurologic patients, promoting video appointments to decrease virus exposure while maintaining consultative services⁸. Half of our responders reported that they could use telemedicine, but only a quarter described it as a service licensed with a precise medical codification, often with dissonant answers from the same country. This might indicate that besides national governments, there was also a discrepant regional response and adaptation of health services, and some local/regional authorities might need further time to adapt.

From our interviewer's perspective, training in neurology has suffered changes with this pandemic. Bedside teaching is one of cornerstones of neurology, passing on to the next generation the

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fundamentals of the neurological examination and the subtle symptoms and signs that often lead to a diagnosis. At the same level, the outpatient clinics are training grounds for the diagnosis and treatment of chronic conditions, and therefore, it is undeniable the impact this pandemic had on the training of young residents. Classes have been mostly temporarily postponed and in-person meetings or conferences have been prohibited, and virtual conferences have emerged as an alternative method to disseminate knowledge in medicine⁹.

However, regarding clinical fellows and Ph.D. students, most of their activities were reduced, with many having to suspend or postpone their research project, with possible repercussions on their grant attributions and research positions.

Lastly, this pandemic has forced many physicians to assume new roles and responsibilities and this included neurology residents.

Our survey has several limitations. Over half of our responders reported having to work on COVID-19 Units, even though they did not feel ready to manage critical patients. Even though this might represent a responder's bias, as those who felt personally affected by this change might be more prone to reply, 50% of the responders is from countries severely afflicted by this pandemic, such as Italy, France or Portugal. Furthermore, our study achieved a low response rate. Indeed, only 15% of all RRFs members completed the questionnaire, most likely due to its length. However, we believe we obtained a good picture of the situation in Europe (Table 2).

In summary, residents and research fellows in neurology have suffered the impact of COVID-19 pandemic on their training and their research activities. While the impact and the duration of the current situation it is still unknown, we should adapt and use it as an opportunity to rethink the current model of care and teaching in Neurology. As recent data suggests that online training (webinars, podcasts, prerecorded sessions) can be a viable teaching alternative, these modalities should be better acknowledged as important teaching tool in Medicine and in Neurology ¹⁰⁻¹¹.

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Table 1. Summary of main data of the 222 survey European responders. SD = standard deviation; n = absolute number.

Demographics		Part 4	Residency program modifications
Age, years (mean and SD)	30.2 (3.67)	Yes, n (%)	193 (87)
Gender		No, n (%)	29 (13)
- Female, n (%)	131 (57.7)	Classes during Residency	
- Male, n (%)	94 (41.4)	Suspended and postponed, n (%)	70 (54)
- Other, n (%)	2 (0.8)	Suspended, papers to read or topic to study, n (%)	13 (10)
Current position		Not suspended, made online, n (%)	35 (27)
- Resident, n (%)	158 (70)	Not suspended, n (%)	2 (1)
- Research fellow, n (%)	36 (16)	Influence of pandemic in Resident's research projects	
- Young neurologist, n (%)	33 (14)	Severe (90-100%), n (%)	46 (21)
European countries, n (%)	208 (92)	Moderate (70-80%), n (%)	40 (18)
Not-European countries, n (%)	19 (8)	Mild (50-60%), n (%)	39 (17)
Part 2	Official modifications/restrictions for inpatient service	Very mild (30-40), n (%)	14 (6)
		None (0-20), n (%)	15 (6)
Cancelation of programmed admissions, n (%)	143 (88)	Not involved in research, n (%)	66 (30)
Merging of neurology unit with other units to clear spaces for COVID Unit or ICU, n (%)	84 (52)	Estimation of reduction in time with neurological patients	
Restrictions to enter hospitals, e.g. prohibition of any visits of inpatients by relatives, n (%)	158 (97)	Severe, n (%)	39 (18)
		Moderate, n (%)	69 (31)
Official modifications/restrictions for outpatient clinics and Day Hospital activities		Mild, n (%)	63 (28)
Prohibition of waiting room usage and to bring relatives to the visit, n (%)	143 (77)	Very mild, n (%)	22 (10)
		None, n (%)	29 (13)
		Reduction in supervision at work	
Suspension of all outpatient clinics, n (%)	169 (89)	Severe (90-100%), n (%)	26 (12)
Suspension of all-day hospital activities, n (%)	158 (83)	Moderate (70-80%), n (%)	22 (10)
Suspension of in-person appointments and use tele-medicine or phone appointments, n (%)	128 (67)	Mild (50-60%), n (%)	43 (19)
		Very mild (30-40), n (%)	39 (18)
Suspension of all sub-specialty activities, allowed urgencies via ER, n (%)	91 (48)	None (0-20), n (%)	47 (21)
		Impact of pandemic on your career	
Part 3	Changes about the management in Neurology Unit	High – 7 to 10 on Likert scale, n (%)	99 (49)
		Mild – 4 to 6 on Likert scale, n (%)	66 (30)
		Low – 0 to 3 on Likert scale, n (%)	44 (21)
Reducing inpatients beds, n (%)	132 (59)	Wish to recover time of training lost in this period	
Sharing rota with other units to let more staff help in COVID-Unit or ICU, n (%)	97 (44)	Yes, n (%)	134 (60)
Reducing ward shifts, n (%)	86 (39)	Have neurology residents been called to help in COVID-Unit?	
Work mostly via smart working, n (%)	42 (19)		
Increasing ward shifts, n (%)	33 (15)		
Telemedicine to reach outpatients		Yes, n (%)	125 (56)
Official authorization from government / official	31 (28)	If you were/are called to work in COVID-Unit	

authorities with new codification licensed, n (%)		Not ready, unprepared to manage critical patients, n (%)	45 (20)
Allowed from government / official authorities, not official coded yet, n (%)	22 (20)	Not ready, I can work under supervision, n (%)	57 (26)
		Not ready, I have studied to work unsupervised, n (%)	26 (12)
On voluntary basis, mostly on disposal, n (%)	62 (56)	Well trained, I can manage a critical patient with Sars-CoV2, n (%)	18 (8)
Not all agreed, n (%)	31 (29)	Staff member infected with SARS-CoV2 in Neurology?	
Reasons of altered care for neurology patients		Yes, n (%)	116 (52)
Postponement of outpatient sector, n (%)	160 (72)	Nurses and MTAs, n (%)	72 (62)
Less diagnostic procedures performed, n (%)	143 (64)		
More procedures shifted to outpatient sector, n (%)	73 (33)	Senior neurologists, n (%)	68 (58)
More time needed for diagnostic procedures and treatments, n (%)	74 (33)	Residents, n (%)	36 (31)

Table 2. Participants divided by country of origin. † Responses from Non-European countries were not included in the analysis.

European Country	Number of participants	Poland	7
		Portugal	58
Austria	4	Romania	8
Belarus	4	Russia	11
Belgium	5	Serbia	8
Bosnia and Herzegovina	1	Slovenia	2
Czech Republic	1	Spain	4
Estonia	1	Sweden	3
France	21	Switzerland	11
Georgia	2	Turkey	12
Germany	7	Ukraine	2
Greece	4	United Kingdom	3
Hungary	2		
Italy	32	Not-European Countries†	Number of participants
Kosovo	1		
Latvia	1	India	1
Macedonia	2	Israel	1
Moldova	1	Kazakhstan	1
Netherlands	3	Saudi Arabia	1
Norway	1	Tunisia	1



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