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ORIGINAL ARTICLE

Specific neurology emergency training of medical residents in Spain☆

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KEYWORDS
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Abstract
Introduction: Training in emergency neurological illness is very important for the neurologist today. The Neurology National Commission has decided to obtain information on the work duties of neurologist residents in the different neurology units of the hospitals of our country and the supervision of the training in urgent pathology.
Method: A survey of adult neurology program directors to find out if their hospital fulfils the program criteria for the residents duty work.

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Results: A response rate of 98.5%was obtained. In 47%of the neurology training units a neurologist supervised resident duty work 24hours a day. In the rest of the neurology training units they did not fulfil all the training program criteria. We analysed the differences between the neurologist training units, and there are great differences between the hospitals and all regions and communities in our country. Only 65% of neurology residents do their education in neurology units who fullfill the national program criteria on training on urgent neurology pathology.
Conclusions: There is too much diversity in resident duty work in neurologist training units and not all the units meet the national training program requirements.

PALABRAS CLAVE
Formación;
Guardias;
Guardias tutorizadas;
Programa residencia;
Residentes

La guardia específica de Neurología en la formación del médico residente en España

Resumen
Introducción: La formación en urgencias neurológicas es fundamental en el programa formativo de los residentes de Neurología. La Comisión Nacional de Neurología (CNN) decidió obtener información sobre el grado en que la Unidades Docentes de Neurología acreditadas posibilitan la realización de guardias específicas de Neurología y su grado de tutorización.
Métodos: Realización de una encuesta a los tutores de las Unidades Docentes de Neurología para comprobar que se cumplen los criterios de la formación en guardias de neurología indicados en el programa oficial de formación.
Resultados: Se obtuvo respuesta del 98,5%de las unidades docentes de Neurología que existen. En el 47%el médico de plantilla de Neurología tiene guardias de presencia física de 24 horas supervisando directamente al médico residente de Neurología. En el resto existe una diversidad de modelos que no cumplen de manera completa los criterios establecidos por el programa de especialidad. La distribución de los distintos modelos de guardias de Neurología varía mucho entre las distintas unidades docentes y entre las distintas Comunidades Autónomas. Sólo el 65%de los médicos residentes de Neurología realizan su formación en unidades docentes de Neurología que tienen guardias de Neurología autorizadas de manera correcta.
Conclusiones: Hay una variabilidad injustificada en el cumplimiento de los criterios de formación en guardias de Neurología en las distintas unidades docentes distribuidas por todo nuestro país, habiendo diferencias de formación entre unos médicos residentes en Neurología y otros.

Introduction

Significant advances have recently taken place in the diagnosis and treatment of patients with acute neurological processes. The demand for urgent neurological assistance has increased significantly, with neurological emergencies now representing between 2.6% and 14% of all medical emergencies.[1] Neurology is the second speciality in the ranking of hospital consultations in emergency service.[2] It has been proven that being attended by a neurologist improves the prognosis of patients, from which it is possible to gather that the assistance provided by the neurologist represents an important improvement in the quality of assistance at emergency services.[3,4] Results are especially significant in the case of acute stroke, in which an early specialised assessment by a neurologist is indispensable for the safe administration of treatments as efficient as fibrinolysis. The lesson from these facts is the need for a neurologist to be duly trained in diagnosis and treatment of neurological emergencies. This is learned during the residency period. The only way to acquire such experience is through assisting patients with acute neurological symptoms at the moment they appear, which in turn is only possible through specific Neurology shifts that include the appropriate level of supervision. In fact, a recently published programme[5] for Neurology specialist training states: "during the second, third and fourth year, residents will carry out specific Neurology shifts, tutored by a Neurology specialist", "tutored shifts have the objective, among others, of promoting the learning of urgent and unexpected neurological attention". The need for specific training in neurological assistance is in fact recognised by the European Board of Neurology, which stipulates among its inclusion criteria for the *European Board Neurology Exam* that the Neurology training program in the country of any candidate must include training in neurological emergencies.[6] This is

the reason why Neurology teaching units have to facilitate specific Neurology shits for their residents. Given that some of the functions of the National Neurology Commission (*Comisión Nacional de Neurología*, *CNN*) are to ensure the quality of Neurology resident training and to comply with the training programme, it was decided to carry out a survey to obtain information on the degree to which accredited Neurology teaching units make specific Neurology shifts possible and the level of tutoring during said shifts.

Material and method

The National Neurology Commission officially required the Sub-directorate General for Professional Regulation of the Ministry of Health and Consumer Affairs to send a letter of inquiry to the different *Comisiones de Docencia* (Teaching Commissions) of the hospitals with teaching accreditations for the training of residents in the speciality of Neurology. These letters requested specific information about the situation of the healthcare centre in relation with attention for neurological emergencies and the degree of supervision of Neurology residents by specialists. An initial request was sent out on 31st March 2008 to all the teaching units, and centres that did not reply were sent another on 9th May 2008.

There are currently 69 Neurology teaching units in Spain. In 2008, these teaching units offered 112 training positions in Neurology.

Taking into account the contents of the Neurology training programme in relation to shifts, teaching units were classified as complying with this aspect in a *complete* manner, *incomplete* manner or *non-complying*.

The National Commission considered hospitals that *complied* with the criteria for degree of supervision during shifts as those hospitals having 24-hour physically-present shifts or those that sent their residents to having mixed shifts (Neurology specialists who were physically present in their shift from 8 AM to 22 PM and on call from 22PM to 8AM the following day). Hospitals with all other situations were classified as *non-complying* (hospitals with internal medicine shifts, on call shifts, continued attention shifts and shifts where residents only coincided with the Neurology specialist during their internal medicine shift).

Results

Responses were received from 68 teaching hospitals, with only one not responding. Each response consisted of a letter addressed to the CNN describing, to a greater or lesser degree of detail according to each teaching unit, how the shift was carried out by the resident and the degree of tutoring available during these shifts.

Figure 1 presents the percentages of the type of shift with an assigned neurologist in the total of all teaching units. There are different models for emergency services at the different units: 1) Units where both the resident doctor and specialist physician have shifts in internal medicine, 2) Units with Neurology shifts including physical presence 24 hours a day and in which the resident doctor accompanies the specialist, 3) Units where there are "mixed shifts",

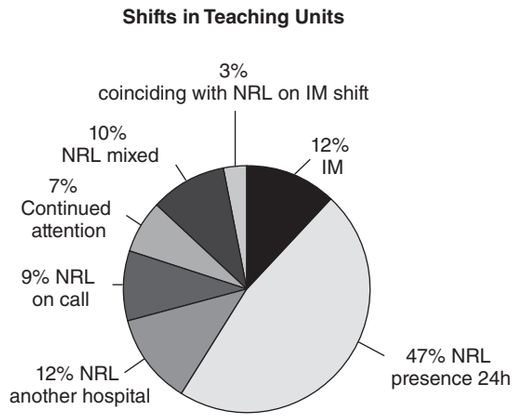

Figure 1 Percentage of Type of Shifts Existing in All Spanish Teaching Units.

meaning that from 8AM to 10PM the neurologist is physically present to attend neurological emergencies and from 10PM to 8AM he is on call (in these cases resident doctors remained with the specialists until they left and from then on they were contacted him if advice was needed), 4) Units where there are 24-hour non-present Neurology shifts, with the resident being present at the hospital and the specialist on call for consultation, 5) Units with continued-attention shifts where specialist take care of neurological emergencies until 8PM and for the rest of the time residents remain with the specialists as long as they are in the hospital and later join the internal medicine shift, 6) Units with no shifts, where residents perform Neurology shifts at another hospital, 7) Units where the specialist carries out shifts in internal medicine and residents make their shifts match those of the specialist to experience medical emergencies

Based on these criteria, the type of shift at each Neurology teaching unit is shown in table 1, classified by Autonomous Regions.

Data analysis reveals that, classifying the hospitals in relation to the number of Neurology residents that they train, out of the 10 hospitals with 3 residents/year in 2008, 6 of them have a physically-present shift, 2 have on call shifts and 1 has a mixed shift (30% of these hospitals either do not meet the criteria or do so incompletely). In addition, out of the 23 hospitals with 2 residents/year in 2008, 17 have physically-present shifts, 2 have mixed shifts and 1 has on call shifts (13% of these hospitals do not meet the criteria or do so incompletely). Out of the 36 hospitals with 1 resident/year, 28 have physically-present shifts (7 of these are carried out in other hospitals) and 8 have internal medicine shifts (22% of these hospitals do not meet the established criteria).

Analysing the degree of compliance of Neurology shifts according to the criteria established by CNN in relation to the number of resident doctors admitted in 2008 to continue their training in the different teaching units, we find that 65% of resident doctors carry out their training in Neurology teaching units that meet the criteria, 10.9% in teaching units that meet the criteria incompletely and 24.5% in teaching units that do not meet the criteria.

Table 1 Types of Shifts at Each Accredited Teaching Unit Distributed by Autonomous Regions

Autonomous Region	No. of Residents Per Year	No. of Teaching Units With Each Type of Shift
ANDALUCÍA	14	NRL presence 24h: 3 NRL presence 24h another hospital:1 NRL with continued attention: 6
ASTURIAS	2	NRL presence 24h: 1
ARAGÓN	4	NRL presence 24h: 2
CANTABRIA	2	NRL presence 24h: 1
CASTILLA-LA MANCHA	5	NRL presence 24h:2 Internal Medicine (IM):1 NRL presence 24h another hospital: 1
CASTILLA-LEÓN	6	NRL presence 24h: 4 NRL on call:1
CATALUÑA	18	NRL presence 24 h: 5 NRL on call: 2 Mixed NRL shift:1
CANARIAS	5	NRL presence 24h:1 NRL on call. 1 NRL shift at Internal Medicine with a resident on NRL shift: 2
EXTREMADURA	2	Internal Medicine: 2
GALICIA	5 (3 in our study, since one teaching unit with 2 residents did not reply)	NRL presence 24h:1 Internal Medicine:1
LA RIOJA	1	Internal Medicine:1
MADRID	25	NRL presence 24h:6 NRL presence 24h another hospital: 5 NRL on call:1
MALLORCA	2	NRL presence 24h:1
MURCIA	3	NRL presence 24h:2
NAVARRA	3	NRL presence 24h:1 NRL mixed:1
PAÍS VASCO	6	NRL presence 24h:1 NRL mixed:3
VALENCIA	9	NRL presence 24h:2 NRL on call:1 NRL presence 24h another hospital:1 Internal Medicine:3

NRL presence 24h: Neurology shift in which the doctor is at the hospital for 24 hours.
NRL presence 24h another hospital: no Neurology shift at the training unit, so the resident carries out the shift at another nearby hospital where doctors have 24-hour presence shifts.
NRL on call: the physician is on call for a Neurology shift and is consulted by telephone. He or she goes to the hospital if necessary.
NRL mixed: the doctors carry out NRL shifts in which they are present at the hospital from 8AM to 10PM. At night they go home, so from 10PM to 8AM on the following day it becomes an on-call shift.
NRL continued attention: the physician covers the evening neurological emergencies until 8PM and then has an on-call shift for the rest of the time. The resident physicians remain with the physicians while they are at the hospital and then join the Internal Medicine shift.
Internal Medicine (IM): the medical staff of the teaching unit carry out Internal Medicine shifts.
NRL shift at IM with a resident on NRL shift: the teaching unit physician carries out Internal Medicine shifts and the Neurology resident makes her or his Neurology shifts match those of the Neurology specialist who is on Internal Medicine shifts.

Table 2 Percentage of First-Year Residents Receiving Their Training at Teaching Units that Meet Criteria in the Different Autonomous Regions

Autonomous region	Criteria Of Shifts In The Programme		
	Full Compliance	Incomplete Compliance	Non-Compliance
ASTURIAS	100%		
ANDALUCÍA	50%	14.28%	35.7%
ARAGÓN	100%		
CATALUÑA	53.3%	20%	26.6%
CASTILLA-LA MANCHA	80%		20%
CASTILLA-LEÓN	84%		6%
CANTABRIA	100%		
CANARIAS	40%		60%
EXTREMADURA			100%
GALICIA	66.6%		33.3%
LA RIOJA			100%
MADRID	87.5%		12.5%
MALLORCA	100%		
MURCIA	100%		
NAVARRA	33.3%	66.6%	
PAÍS VASCO	33.3%	66.6%	
VALENCIA	44.4%		55.5%

"*Full compliance with criteria*" *:* hospitals that have physically-present 24-hour shifts or that refer their residents to perform their shifts at other hospitals.
"*Incomplete compliance with criteria*" *:* hospitals that have mixed shifts (the neurologist is on a physically-present shift from 8AM to 10PM and on call from 10PM to 8AM the following day).
"*Non-compliance with criteria*" *:* hospitals that have internal medicine shifts, on call shifts, continued-attention shifts and shifts where the resident only coincides with the neurologist on internal medicine shifts.

The analysis of the number of residents in 2008 who carry out their training at teaching units meeting the criteria, classified by autonomous regions, is shown in table 2.

Discussion

This is the first study ever published analysing Neurology shifts at the different hospitals that form neurologists in our country.

We have carried out an analysis of the specific situation of Neurology shifts in the training of Neurology resident doctors at the different teaching units in our country, taking into account different aspects.

The first aspect is the degree of compliance with the program for neurologist training in relation to the performance of those shifts by the resident doctor and their supervision and tutoring by specialist neurologists. The global situation in our country is that in 47% of the 69 teaching units, the neurologist has physically-present 24-hour shifts supervising the Neurology resident doctor. In the remaining teaching units, there are different shift models which go from internal medicine shifts, with no Neurology-specific shifts to different models of continued neurological attention.

This data proves that there is great diversity in the neurological 24-hour attention models at different hospitals in our country. Similar studies analysing the degree of compliance of accreditation criteria in teaching units in our country have already shown that there are significant differences between units.[7]

There should not be such diversity in shifts and training at hospitals with Neurology teaching units. It seems probable that this lack of uniformity comes from the difficulty of complying with the speciality programme. Until now, not all hospitals in this country had specific Neurology shifts and setting them up has been difficult due to various factors: the human and economic resources necessary to carry out Neurology shifts at a hospital, a change of mentality by Neurology specialists about the need to carry out 24-hour Neurology shifts and the personal effort this represents, changes in the continued-attention model imposed by some healthcare authorities, etc. Some of the shift models which are carried out are probably an attempt to fulfil the program with the resources available, as in the case of shifts where the resident doctor is on his Neurology shift while the neurologist is on an internal medicine shift.

Analysing this same aspect of training programme compliance by separate autonomous regions, an important variability can also be observed in the manner that Neurology shifts are performed in different regions. From the point of view of resident training, it is clear that for the programme to be uniform throughout the whole territory there should be an attempt to homogenise the type of shifts, to eliminate any training differences between autonomous regions.

When analysing the degree of compliance by different teaching units taking into account their degree of training

capacity (that is, the number of residents trained by each teaching unit), it is surprising to observe that at least 2 out of the 10 Neurology units that form 3 residents/year do not comply with the training criteria with respect to shifts.

Although most countries in our environment (Europe and USA) contemplate carrying out shifts during the training of different medical specialties,[8] there is great variability in the training followed in each country and there is no data in the medical literature about how shifts are performed in each training programme.[9,10] The topic of shifts performed by residents has been controversial in recent years because of legislative changes carried out in these countries, which limit the number of shift hours that a resident doctor can perform.[11,12] This has led to broad reflection over the repercussions that this disposition may have in training; studies and opinions suggest that this measure could decrease the quality of training, because residents will have less time for training, especially in surgical specialties.[13]

We have no information about the type of shifts that resident doctors carry out in countries similar to ours and the degree of supervision during these shifts. In a study based on a survey for resident doctors in the USA, residents attributed their medical errors to various factors, among which they included lack of supervision.[14]

Analysing this matter from the point of view of the number of residents who are trained in units not meeting the criteria, we conclude that 65% of residents in our country receive their training in teaching units complying with the model of supervised Neurology shifts. Almost 25% of the units do not meet this criterion. Once again, we observe a non-homogenous distribution between autonomous regions.

One aspect of our study that could be controversial is the methodology used to obtain our information. Surveys are always prone to a certain degree of subjectivity and veracity that depends on the people completing them. Our surveys were sent to the training commissions at each hospital and we do not know who completed them or how much information that person had while filling out the survey. This could be a weakness in this type of study, as has been commented in similar studies published by the specialty commission.[15]

The importance of neurological emergencies due to their frequency and severity and the assistance data from our teaching units reflect the importance of training in neurological emergencies. Neurology teaching units must follow the individual aspects of structured resident training programmes in this area of Neurology in the same manner as in other areas.

In conclusion, the information received allows us to state that 65% of Neurology teaching units meet the training criteria in relation to the shifts established by the new Neurology training programme. We believe there is some concern about this in teaching units and that, in the near future, the means necessary will be developed to allow more units to establish Neurology shifts.

Conflict of interest

The authors declare no conflict of interest.

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