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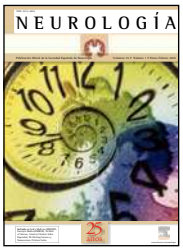

ORIGINAL ARTICLE

A descriptive analysis of ambulatory neurological care demand in Burgos Health Area

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KEYWORDS
Descriptive epidemiology;
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Practice

Abstract
Introduction and objective: To determine the ambulatory neurological care demand in Burgos Health Area and to describe the demographic, assistance and diagnostic data following recommendations of assessment of disease morbidities and use of health systems at a regional level.
Patients and methods: This is an observational descriptive study that prospectively recorded ambulatory demand of first neurological visits during the year 2008. Demographic, assistance and diagnostic data of the 1,341 patients that attended the neurology clinic were recorded.
Results: The 1,524 visits requested was equivalent to a demand of 15.08 visits per inhabitant older than 14 and per year. Twelve per cent of patients did not attend the requested visit. The mean age of the total sample was 56.29 years, of which 60.99% were women and 42.20% were older than 65 years. A total of 76% were sent by their general practitioner, of which 70% were non-urgent. The most common referral causes were headache (26%) and dementia (15%), and the diagnoses at the end of the neurology visit were headache (27%) and "no neurological disease" (19%). Among patients older than 65 years, dementia and movement disorders made up 34% of neurological diagnoses. After the first visit, 59% of patients were discharged to their general practitioner.
Conclusions: Headache is the most common complaint for referral to neurology in our region. Advanced age increases the demand due to a higher prevalence of neurodegenerative diseases. The high proportion of direct discharges suggests a poor selection of the patients referred from primary care and underlines the need for a more rational patient selection for referral to secondary care.

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PALABRAS CLAVE
Epidemiología descriptiva;
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Demanda neurológica;
Neurología ambulatoria;
Demanda asistencial;
Actividad asistencial

Análisis descriptivo de la demanda asistencial neurológica ambulatoria en el área sanitaria de Burgos

Resumen
Introducción y objetivo: Conocer la demanda asistencial de primeras visitas en el área sanitaria de Burgos y describir variables demográficas, asistenciales y diagnósticas de las mismas, siguiendo recomendaciones de la OMS que anima a que se realicen estudios de morbilidad y del uso de los sistemas de salud a nivel regional.
Pacientes y métodos: Estudio observacional, prospectivo y descriptivo de la demanda de primeras visitas neurológicas en una consulta durante 12 meses (enero 2008-diciembre 2008). Se registran variables demográficas, asistenciales y diagnósticas de los 1.341 pacientes que acudieron consecutivamente a la consulta.
Resultados: Se demandaron 1.524 consultas. Son 15,08 solicitudes por 1.000 habitantes/año mayores de 14 años. Hubo un 12% de incomparecencias. La edad media es 56,29 años. El 60,99% son mujeres. 42,20% son mayores de 65 años. Un 76% se derivan desde atención primaria. Un 70% se remitieron de modo ordinario. Los motivos de derivación más frecuentes son cefalea (26%) y demencia (15%). Los diagnósticos emitidos con más frecuencia son cefalea (27%) y no neurológico (19%). En mayores de 65 años demencia y trastornos del movimiento aglutinan el 34% de los diagnósticos. Tras la primera consulta se dio alta al 59%
Conclusiones: La cefalea es el principal motivo de consulta. La edad avanzada condiciona alta demanda por mayor prevalencia de la patología neurodegenerativa. El alto porcentaje de altas tras la primera consulta traduce una escasa selección de las remisiones y la necesidad de racionalizar el acceso de pacientes al segundo nivel asistencial.

Introduction

For the proper planning of health-care resources, as stated by the WHO,[1] it is fundamental for clinical practice and the needs for care to be fully understood. The WHO encourages conducting these studies at a regional level. For years now, ageing populations, the growth of the welfare society, and the progress being made in the field of diagnostics and treatment have increased the demand for care;[2] this is particularly salient in the area of non-hospital care. In Spain, several works have described ambulatory neurological care, with some of the most recent ones coming out of Aragon,[3] Catalonia,[4-7] Madrid,[8,9] the Community of Valencia,[10-12] Andalusia[13] and the Canary Islands.[14] The data used for planning care should be based on local evaluations, since demand varies from one area to another. We have not found any published works addressing this issue in the Region of Castilla y León, nor do we have any studies regarding resource utilization in our area.

The aim of the present work is to understand the demand for first neurological visits in the health-care catchment area of Burgos and to describe demographic, care, and diagnostic variables of these visits so as to enable us to plan and better apply limited resources.

Patients and methods

This is an observational, prospective, descriptive study of the demand for first visits of consecutive patients at a neurology clinic belonging to the Burgos Care Complex. The analysis covers a 12-month period (January until December, 2008). This centre covers the demand for neurological ambulatory care in the only health-care catchment area for Burgos province, which has a population of 373,672 inhabitants (189,675 males and 183,997 females). Of these, 76,397 are over the age of 65 years (20.44%) and the total population over 14 years of age is 329,929 inhabitants. The provision of ambulatory neurological care takes place in 4-5 clinics daily. Prospective data were collected about the patients referred for a first visit to one of the clinics. Patients over the age of 14 years were seen by referral from health-care centres, internally from the hospital (Emergency Room and other specialist clinics), and from the two district hospitals in the region (there are no neurologists at these centres). When calculating the incidence of first visits, the population over the age of 14 years was analyzed. Data were collected from all patients sent for an initial visit, despite the fact that the patient might already have been evaluated previously. The patients referred following admission were considered as check-up visits and were not counted.

Several demographic variables (age, gender), care variables (origin of the referrals, reasons for referral, type of referral, patient's destination), and diagnostic variables were recorded with respect to those patients who showed up for their appointment. There were many reasons for referral and diagnoses; as a result, they were grouped into the categories listed on table 1 in order to make analysis easier, bearing in mind major syndromal groups. For practical considerations, the less common groups were pooled as a category entitled "other diagnoses". The non-epileptic paroxysmal group concentrates the consultations requested for syncope, vertigo and dizziness.

The data were recorded on a database using the Excel 2007 programme for subsequent treatment and examination using descriptive statistical methods. The qualitative data are reported as means of absolute frequencies and percentages and the quantitative data in terms of means and ranges.

Table 1

Reasons for referral
1. Headache/ facial pain
2. Dementia/ cognitive alteration
3. Movement disorders
4. Epilepsy
5. Peripheral nervous system
6. Vascular
7. Non-epileptic paroxysmal: syncope, vertigo, non-specific dizziness
8. Gait disturbance
9. Vision disturbance
10. Neurosurgery
11. Other

Diagnostic categories
1. Headache
2. Dementia
3. Movement disorders
4. Epilepsy
5. Non-epileptic paroxysmal: syncope, vertigo, non-specific dizziness
6. Peripheral nervous system
7. Vascular
8. Other
9. Non-neurological

Results

According to the centre's appointment data, during the year 2008, a total of 4,976 first visits to Neurology were requested. This represents 15.08 requests per 1,000 inhabitants over the age of 14 years per year. Just over 30%(30.68%) of the 1,524 patients were referred to the clinic analyzed. One hundred and eighty-three patients (12%) failed to show up for their appointment. The data from the 1,341 patients who did keep their appointment are reported.

Demographic data

The mean age of the sample was 56.29 years, ranging from 8 up to 95 years. Close to 61%(60.99%) were female (818); the mean age was 55.7 years, and 39%(523) were male, with a mean age just over the age of 57.2 years. The distribution by age and gender is reflected in figure 1. More than forty-two per cent (42.20%) (566) were over the age of 65 years. It is worth noting that 6.56%(88) were over the age of 80 years.

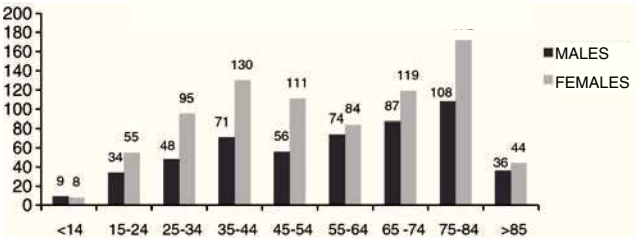

Figure 1 Age-gender distribution.

Care data

One thousand and twenty-five patients were referred by their family physician (76%); 75 (6%), from hospital emergency room services; 83 (6%) from other hospitals, and 158 (12%) were referred from specialist care departments within the hospital. The type of referral was ordinary in the case of 944 (70.39%), whereas 302 (22.52%) of the referrals were preferential and 9 (0.67%) were emergency cases. This information was not recorded for 86 of the subjects. Forty-one per cent (41%) are still continuing with check-ups.

Reasons for referral

Headaches are the most common reason for referral followed by cognitive impairment. The absolute frequencies and percentages of the disease are distributed as shown in table 2. Considering the groups by age, headache is the most common presenting complaint in people under the age of 65 years (38%) and dementia is the most common presenting complaint in individuals over the age of 65. Dementia together with movement disorders represent 47% of the consults carried out in people over the age of 65. Close to one in three people in this age group consult for dementia.

Diagnoses

The most commonly issued diagnosis is headache in 27%, which rises to 38%if we consider only those under the age

Table 2 Absolute values and percentage of reasons for referral, as a total and in patients under and over the age of 65

Reason for referral	Under 65 years of age	%	Over 65 years of age	%	Total	%
Headache	293	38%	61	11%	354	26%
Dementia	22	3%	179	32%	201	15%
Peripheral nervous system	136	18%	33	6%	169	13%
Other	102	13%	59	10%	161	12%
Paroxysmal, non-epileptic	66	8%	55	10%	121	9%
Movement disorders	23	3%	87	15%	110	8%
Epilepsy	59	8%	9	2%	68	5%
Vascular	18	2%	30	5%	48	4%
Neurosurgery	33	4%	11	2%	44	3%
Gait disturbance	8	1%	34	6%	42	3%
Vision disturbance	15	2%	8	1%	23	2%

of 65 years. Nineteen percent receive a non-neurological diagnosis; five percent are diagnosed with epilepsy. In the group of patients over the age of 65, dementia was confirmed in 16% Cognitive impairment and movement disorders account for 34% of the diagnoses in this age group. In a more in-depth analysis of the 121 patients who consult in the non-epileptic paroxysmal group, 16 (13%) receive a neurological diagnosis, 105 (87%) coincide with the diagnosis made by the family physician. Of all patients, 100 (83%) were discharged after the first consultation.

Discussion

The demand for neurological care depends on the prevalence and incidence of neurological diseases and referral for such diseases is made on the basis of a great many variables.[15] Several works have addressed the issue of the demand for care in recent years. Static transverse studies of initial consultation, of which ours is one, give us an idea of the status of care in an area. Some include hospital care,[9,16] others refer to the whole of ambulatory care with first visits and subsequent check-ups.[6,10,14] The classification of diagnostic categories varies in each review, but the main syndromal groups almost inevitably appear, enabling assessment of what we care for in each area and a fair degree of comparison (table 3). Initial consultations are a better indicator than follow-up visits of the demand for neurological care and are certainly a better reflection of the incidence of neurological diseases in the community than subsequent visits, which are subordinated to the manner of working of each neurologist.

We present here the first registry of the frequency of ambulatory neurological pathology in the province of Burgos. Based on the proportion of patients cared for, we believe that the sample is probably representative of the population we are referring to. Our neurology service cares for adults, whereas paediatrics takes care of patients under the age of 14 years. Nevertheless, we do receive a very small proportion of children, which have been excluded when calculating the incidence of first visits so as to avoid altering the true proportion of consultations with respect to the population in our care. Studies reflecting the use of neurology clinics report a rate of between 5 and 27 consultations per 1,000 inhabitants and year.[3,5,7,10,12,17,18] If we compare ourselves with other regions, we are therefore enduring an average burden of care.

The predominance of females in all age groups is the norm, some 60% of the visits in all series.[3,5,8,10-12,19,20] In a community with a predominance of men, this is probably explained, at younger ages, by the greater frequency of headaches in women while, at older ages, it probably has to do with the greater life expectancy for women.

The mean age of the individuals cared for varies between 50 and 60 years[3,4,10-13,19,20] and is rarely less than 50 years in recent papers.[5,18] Although patients cover all ages, 42.20% of the demand is from patients over the age of 65, who account for 20.44% of our population; this might be expected in our community, as it is one of the most aged in Europe. The population cared for over the age of 65 years is close to 40% in the works reviewed.[10,12] There are some exceptions in our setting[11,13,20] although one of these studies analyzed the immigrant population, which tends to have a different age profile. Three out of every four patients who come to consultation are referred from Primary Care, conferring great importance to Primary Care physicians when determining demand for neurological care. The number of patients who fail to come to their appointment is high, albeit not so much so if we bear in mind that in other studies it is between 18-20%.[4,6,12,20,21] Nevertheless, in several works first and subsequent visits are all put together in this regard. When other authors specifically analyze this aspect, they relate failure to come to the appointment with being young, having been referred from the Emergency Room and, above all, with waiting lists having a long delay, because the patient forgets about the consultation.[21]

As expected, given their high incidence and prevalence, headaches are the most common reason for consultation, as well as the most common diagnosis. They account for between 27 and 41% of all referrals to the neurologist.[3-5,8,10-12,16,18] More than 1 in 3 young patients come for this reason. Cognitive alteration is the second most common reason for referral, well ahead of epilepsy, for which only 5% of the consultations are requested, compared to the 16-18% reported by other groups.[4,10,12] If we only take into account the population over 65, almost one in three are referred with a suspicion of dementia and if we add dementias and movement disorders, we are talking about half of all referrals. However, the diagnosis of dementia was only confirmed in 7%; that is to say, half of the patients who were sent with a suspicion of cognitive impairment, did not have any such problem. These findings have already been reflected in other studies.[12] Our findings should contribute to the revision of the referral criteria applied for this pathology in Primary Care. The proportion of dementia is lower, less than 5%,[5,18] when we review older studies, increasing to the point of becoming the number one diagnostic group in more recent papers, even surpassing headaches.[6] Several studies reflecting on the status of ambulatory neurological care unanimously predict an increase in demand,[15] and when they analyze care in evolutionary terms[4,19] in the same area, it is apparent that this demand is growing, above all, due to age-related degenerative disease.[8] Thus, in the study carried out in Tortosa, Tarragona,[4] consultations for cognitive impairment increased by 135% over a mere 6 years. If we add to this the greater culture of health-care and well-being, plus the expectations generated by new treatments, it is possible that in our aged community, neurology is also heading towards a "demented" future.[19] Given that it is a problem of clinical diagnosis requiring a great deal of time for evaluation and with demand predicted to go up, we must, if we pursue quality of care, consider the changes in the type of pathology we are caring for so as to adjust consultation times better.

In both the area of movement disorders, as well as epilepsy, our figures are in line with those reported in other studies.[6,8,10-13,17]

Within the reasons for consultation, we include a diagnostic category that we have called "non-epileptic paroxysmal" agglutinating requests for consultation due to syncope, vertigo, and non-specific dizziness, with the intention of reflecting a common section for pathologies in which a differential diagnosis must be made, mainly with epilepsy. In one study in which a similar group was studied, they accounted for 13% of the diagnoses.[11] Cerebrovascular disease represents a low percentage of the consultations requested, with this low weight despite its high prevalence explained by the type of organization of care following discharge from hospital, as the visits are recorded as follow-ups.

In the series analyzed, between 3 and 11%[4,8,10,11] of patients consult for diseases related to the peripheral nervous system. The high rate we have recorded has to do with the fact that in our setting we receive carpal tunnel syndrome patients, who follow variable circuits of care and are referred to traumatology or rheumatology in other areas.[4]

Table 3 Comparison of epidemiological studies

	Zaragoza 1993	Aragon 1995	Valencian Community 1996-1997	Baix Camp, Tarragona 1999	Vega Baja, Alicante 1999-2000	Marina Baixa, Alicante 2003-2004	Rubi, Barcelona 2004-2005	Tortosa, Tarragona 2003-2004	Madrid 2004	Elche, Alicante 2005-2006	Huelva 2005-2006	Girona 2006-2007	Burgos 2008
Period (months)	3	3	3	12	24	2	9	12	6	12	6	24	12
Patients	552	3,489	954	1,278	2,227	1,000	1,460	4,001	1,163	3,229	500	1,078	1,341
Failed to keep appt						19.10%	20.34%	20.90%		18%			12%
Mean age	45.1	51.9	52	48.7	51.6	58.04		56.7	58.95	56.8	51	60.6	56.29
%females	57.60%	57%	52%	61.80%	60%	56.40%		62%	60.60%	62%	63.40%	61.40%	60.99%
%over 65					34%	39.62%				42.60%	26.80%		40.20%
Referred by Primary Care	84.70%	79.30%	42.70%					69%		93%			76%
Headache referral				36.46%	32.10%	28.20%				27.20%	41%		26%
Cognitive impairment referral				3.80%	10.00%	21%				15.90%	17.20%		15%
Movement disorder referral				8.52%	8.80%	8.30%				13.10%	5.60%		8%
Diagnosis: headache	30%	25.50%	16.30%	35.80%	29%		20.80%	24.10%	24%	28%	42.80%	18.60%	27%
Diagnosis: dementia	2.30%	3%	5.80%	3.80%	7.20%		32.93%	15.90%	16.70%	12.24%	12%	31.50%	7%
Diagnosis: Movement disorder	7%	7.50%	7.10%	5.30%	9%		20.89%	11.70%	10.90%	9.30%		11.70%	9%
Diagnosis: epilepsy	6.50%	6%	15.80%	6%	8.80%		5.76%	5%	8.70%	5.10%		6.50%	5%
Diagnosis: stroke	11.70%	12.50%	15.17%	4.70%	6.20%		4.55%	7.40%	12.80%	8.70%		3.50%	4%
Diagnosis: Neuropathy				7.40%	3.00%		2.49%	7.50%	11.70%	3.60%		5.10%	9%
Non-neurological	10.60%	4.40%	9.80%	3.10%	17%	4.50%		18%	6.50%	21.80%	8.20%		19%
Discharges	80.50%	62%	21%			15.60%	9.20%	21.10%	3.90%	42%	40.20%		59%
Requests per 1,000 inhabitants	11.7	18.3		10.3	10.6	27.5		9.3		18.9		5.8	15.8

Nineteen percent of the patients did not suffer from any neurological disease, even after separating the group of syncope, vertigo, and psychogenic dizziness. It is the second most common diagnosis, as was the case of the review in Elche,[12] and to be expected when we compare our data with that of other series in which the figure varies between 10 and 21%.[4,11,16,18,19] The issue of what is deemed to be non-neurological pathology, using largely subjective criteria, is essential in deciding what proportion of patients has been mistakenly referred.

The discharge rate is higher than that of other studies, which cite figures between 18 and 50%.[12,13,18] This is to be expected if we bear in mind the high proportion of non-neurological pathologies referred, as well as the percentage of individuals referred for syncope, non-specific dizziness, and vertigo. We consult at the request of the family physician on any number of symptoms and respond by establishing the diagnosis and transferring the follow-up of common neurological cases to Primary Care. A better selection would enable us to decrease the delay in care and increase the time spent with a neurologist by those truly needing one.[5]

Things have not changed much in the last 10 years when it was pointed out that the system was being used to care for an overwhelming and poorly filtered demand.[14] We continue to need a more rational access to neurologists, so that specialized care can be more effective.

With this local evaluation we have real information available to us with respect to care activity during initial visits in our setting, a very necessary aspect for planning. Our figures do not differ much from the figures reported by other neurologists, except for the high number of discharges following the first visit; this similarity is to be expected in the light of the relation between the incidence of neurological illness and what we find during consultation. There are two types of patients presenting at our clinics: young females who consult for headache and those over the age of 65 years, who consult mainly due to cognitive impairment and movement disorders. The high number of non-neurological diagnoses and discharges after the first consultation reveals that there is an excessive demand for neurological care, which translates into scant selection at the level of Primary Care and the need to set up strategies to improve this aspect. Regular evaluations will be needed in this area in order to match the services provided with the ever-changing needs of neurological care.

Conflict of interest

The authors state that they have no conflict of interest.

References

1. White KL. Fundamentos y práctica de la Planificación y de la Gestión Nacional de la Salud. Cuadernos de salud Pública nº 46. Ginebra: Organización Mundial de la Salud; 1977.
2. Morera-Guitart J. Asistencia neurológica ambulatoria en España. Pasado, presente, ¿futuro? Rev Neurol. 2005;41:65-7.
3. Gracia-Naya M, Usón-Martín MM. Grupo de Estudio de Neurólogos Aragoneses. Estudio trasversal multicéntrico de las consultas externas de Neurología de la Seguridad Social en Aragón. Resultados globales. Rev Neurol. 1997;25:194-9.
4. Huerta-Villanueva M, Baiges-Octavio JJ, Martín-Ozaeta G, Muñoz-Farjas E, Rubio-Borrego F. Evolución de la demanda de asistencia neurológica ambulatoria y patología atendida en la consulta de neurología de la región sanitaria de Tortosa. Tarragona. Rev Neurol. 2005;41:68-74.
5. González Penacho J, Olivé Plana JM. Epidemiología de la patología neurológica ambulatoria en el Baix Camp (Tarragona) durante 1999. Neurología. 2001;16:154-62.
6. Fragoso M, Aguilar-Barberá M. Análisis de una consulta de Neurología ambulatoria en el área de Rubí. Barcelona. Rev Neurol. 2006;42:58-9.
7. López-Pousa S, Monserrat-Vila S, Turró-Garriga O, Aguilar-Barberà M, Caja-López C, Vilalta-Franch J, et al. Análisis de la demanda asistencial neurológica generada por la atención primaria en un área geográfica de las comarcas de Girona. Rev Neurol. 2009;49:288-94.
8. Villarejo A, Porta-Etessam J, Martinez-Salio A, de Frutos V, Ruiz J, Almajano J, et al. Análisis comparativo de la asistencia neurológica ambulatoria en el área sanitaria 11 de Madrid entre los años 1986-1987 y 2004. Neurología. 2004; 19:647.
9. Bermejo F, Calandre I, Morales MA, Gutiérrez-Rivas E, Mateos F, Molina JA, et al. Estimación de la demanda neurológica en un área sanitaria de Madrid (área 11, Hospital Universitario 12 de Octubre). Neurología. 1999;14:444-51.
10. Pérez-Carmona N, Sánchez-Pérez R, Abellán-Miralles I, Díaz-Marín C. Asistencia neurológica ambulatoria en el área de Marina Baixa. Alicante: Rev Neurol. 2004;39:607-13.
11. Sempere AP, Mola S, Medrano V, Esguevillas T, Costa C, Salazar V, et al. Epidemiología descriptiva de la asistencia neurológica ambulatoria en el área Vega Baja (Alicante). Rev Neurol. 2002;35:822-6.
12. López-Hernández N, Espinosa-Martínez J. Análisis descriptivo de la asistencia neurológica ambulatoria en Elche. Alicante. Rev Neurol. 2007;45:219-23.
13. López-Domínguez JM, Rojas-Marcos I, Sanz- Fernández G, Blanco-Ollero A, Robledo-Strauss A, Díaz-Espejo C. Análisis descriptivo de la demanda de asistencia neurológica ambulatoria en un área sanitaria de Huelva. Rev Neurol. 2007;44:527-30.
14. Villagra P, Cubero A. Estudio de la demanda asistencial en una consulta jerarquizada de Neurología correspondiente al área Norte de las Palmas de Gran Canaria. Rev Neurol. 1997;25: 1544-6.
15. Bermejo-Pareja F. Neurología y neurólogos en España: ¿la consolidación del neurólogo de cabecera? Neurología. 2007;22:221-35.
16. Antigüedad A, Bárcena J, Pérez Bas M, Aldape J, Hurtado P, Zarranz JJ. Actividad asistencial de los facultativos especialistas de área en neurología: experiencia en Vizcaya. Neurologia. 1995;10:324-9.
17. Morera-Guitart J, por la Comisión de 'Análisis de la Calidad' de la Sociedad Valenciana de Neurología. Estudio transversal multicéntrico de la asistencia neurológica extrahospitalaria en la Comunidad Valenciana. Rev Neurol. 1998;27:438-46.
18. Gracia-Naya M, Marta E, Usón M, Carod J. Estudio epidemiológico descriptivo de una consulta externa de Neurología. Rev Neurol. 1996;24:633-7.
19. Morera Guitart J, Pedro Cano MJ. Variación en la patología atendida en las consultas de Neurología: un futuro demencial. Neurología. 2003;18:417-24.
20. Miralles Martínez A, Diez Tejedor E. Análisis de la demanda asistencial de la población inmigrante en la atención neurológica ambulatoria. Neurología. 2008;23:361-6.
21. Iñiguez-Martínez C, Larrodé-Pellicer P, Mauri-Llerda JA, Santos S, Tejero-Juste C, López-García E, et al. Evaluación de los pacientes no presentados a las consultas de neurología. Rev Neurol. 2003;37:1104-6.