

Miguel Angel Hernández

Epidemiology of multiple sclerosis in the Canary Islands (Spain) A study on the island of La Palma

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M. A. Hernández (✉)
Service of Neurology
Hospital Ntra. Sra. de Candelaria
C/Rosario s/n
38010 Santa Cruz de Tenerife
Canary Islands, Spain
Tel.: +34-922/60 20 51
Fax: +34-922/60 05 35
E-Mail: mhernandezp@meditex.es

■ **Abstract** *Objective* To determine the prevalence of multiple sclerosis (MS) on the Island of La Palma, Canary Islands, Spain. *Methods* A population-based transverse study was carried out on the Island of La Palma (population: 81,507), from 1995 to 1998. The 15 December 1998 was established as prevalence day. Sources of information were periodically obtained from case records from public primary care centres, private hospitals, private centres, magnetic resonance units and others. In accordance with the Poser criteria all cases of definite or probable MS were included. *Results* 34 cases of MS were found on prevalence day (9 male and 25 female):

32 cases were clinically definite and 2 were clinically probable MS. Crude prevalence was 42/100,000. Incidence during time of study was 2.25/100,000. *Conclusions* The island of La Palma could be considered as an area of medium-high risk, the risk being higher than that expected because of the geographical latitude of the island. This study confirms the hypothesis of the high prevalence of MS in Spain. We have not found significant clinical differences in MS patients from those in other studies.

■ **Key words** Multiple sclerosis · prevalence · epidemiology · incidence

Introduction

Multiple Sclerosis (MS) is one of the most common chronic neurological disorders in young adults in developed countries. Classically, distribution has been established based on latitude, the prevalence being higher in northern latitudes [1]. In the South of Europe, prevalence studies carried out at the beginning of the 1980s show a medium-low prevalence. There is little information about epidemiological data in Spain [1, 2].

At the beginning of the 1990s, several prevalence studies of MS in defined geographical areas with reduced population (lower than 100,000 population) were carried out in Spain, using a broad methodology and not just based on hospital case records. Prevalence figures varied between 53 and 65 cases/100,000 population, thus

showing that the Spanish Peninsular is in an area of medium-high risk of MS [3–10].

In the Canary Islands, two prevalence studies of MS have been published [11, 12]. In the first study carried out on the Island of Gran Canaria, a prevalence of 6.2 cases/100,000 was obtained [11], and later on the Island of Lanzarote, it was 15/100,000 [12]. Both studies were based on hospital records.

The Canary Islands, because of their particular geographical location (next to the African continent but with a population of mainly European ancestry), constitute a region of great interest for epidemiological studies of MS, not only at a Spanish but also at a European level. Furthermore, geographical insularity gives us an area that is well defined for an epidemiological study. We decided to carry out an epidemiological study of MS on the Island of La Palma in order to determine its prevalence and incidence.

Materials and methods

■ Geographical aspects

The Island of La Palma is situated at a latitude of 28° 25' North and longitude 28° 51'. The island has 14 districts, *Santa Cruz de La Palma* is the capital of the island which is part of the Spanish Province of Santa Cruz de Tenerife. It is the third island in terms of population in the Archipelago. Population: 81,507, including 40,401 males and 41,106 females [13].

The Island of La Palma has an area of 706 square kilometres. The present population of La Palma is made up mainly of descendants of Spanish settlers. The population has remained fairly stable for the last few decades, although there was some emigration to South America at the beginning of the 20th century. The main economic activity is agriculture. However, in the last few years the tourist sector has become very important.

■ Health structure

The Island of La Palma is made up of six Health Districts, i. e. 1 public regional hospital, 8 health centres and 12 private medical clinics.

■ Method

A population-based transverse study was carried out on the whole health system of the Island of La Palma from 1995–1998. The sources of information were initially obtained from the case records of clinical files in the *Hospital Virgen de las Nieves* in La Palma and in other public hospitals in the province of Santa Cruz de Tenerife. Information was also obtained from records from Health Centres on the island. Records came from patients with confirmed or suspected MS. Hospital files were periodically consulted in public and private hospitals, private medical clinics, magnetic resonance centres, patients associations, social services and pharmacies.

All cases of defined or probable MS were included, according to the Poser criteria [14]. Each of the cases was evaluated by two neurologists, and its clinical form and category was established according to the EDSS and the Poser progression index [15]. The progression type was defined according to consensus criteria established by Lublin et al. [16].

Crude prevalence was defined as the number of patients per 100,000 population diagnosed as having MS and living on the Island of La Palma on 15 December 1998. Incidence of new diagnoses of MS detected in the period of study was calculated, based on the date of the onset of the first symptoms of the disease.

Results

In the study, 34 cases of MS were found on prevalence day: 9 male and 25 female (1:2.7). Clinically, there were 32 definite cases of MS and 2 probable cases. Crude prevalence was 42 cases/100,000. Prevalence in males was 22/100,000 and for females, 60/100,000. Prevalence for clinically definite MS was 39/100,000.

During the period of study (1995–1998), the incidence was 2.25/100,000; an increase was observed in 1996. Breakdown of clinical cases was as follows: 21 cases of relapsing-remitting (61%), 11 cases of secondary progressive or remitting progressive (32%) and 6 cases of primary progressive (6%). Mean EDSS score was 3.76

(range 1–8.5) and the Poser progression index was 0.38. 70% of patients were included in the group having benign evolution of the disease, according to the criteria defined by the Poser Progression index [15]. During the period of the study no deaths due to MS were recorded on the Island of La Palma.

The mean age of patients on prevalence day was 39.15 years (SD 11.38, range 18–61). The mean age at onset was 29.76 years (SD 8.33, range 14–47), and the mean duration of the disease was 11.5 ± 9.5 years, with an interval of 1–34.

The mean time from the onset of symptoms was 3.6 years (SD 2, range 0–29). The most frequent forms of clinical onset were sensory symptoms (40%), followed by symptoms of pyramidal disorder (34%), visual symptoms (18%), symptoms in the cerebral trunk (10%) and cerebellar symptoms (7%). We found only one familial case; two women, a mother and daughter. Except for two, all the patients had had at least one MRI investigation.

29 of the patients were born in the Island of La Palma (85%), two patients on other islands in the Archipelago (6%) and three outside the Archipelago (9%). Except for three cases, all of the patients were resident on the Island of La Palma when the disease was diagnosed. The geographical distribution of MS cases was uniform over the whole of the Island.

All the patients lived in their own homes except for one who was in a centre for chronically ill patients.

Discussion

The prevalence of MS on the island of La Palma was 42 cases/100,000. This prevalence was higher than that found on other islands in the Archipelago in previously published studies and in which only hospital records were used [11, 12]. The clinical features of the disease determine that its prevalence is lower than its real incidence as most benign cases are not detected or they are detected late.

As to the geographical distribution of MS according to the North-South divide, the Canary Islands should have a low-risk prevalence, less than 5 patients/100,000 because of the latitude of the islands [1]. The results of the study actually showed that the Island of La Palma is an area of medium-high risk of MS.

The population of La Palma is demographically stable and racially uniform, of mainly Spanish origin. In the last few decades, no significant migratory movement has occurred in the population of the Island.

With regard to the epidemiological studies of MS carried out on the Spanish Peninsular using similar research methodology, we found a slightly lower prevalence. The mean prevalence of MS in the Spanish population is around 55/100,000 (Table 1).

Table 1 Prevalence rates per 100 000 population in Spanish studies

Author (year)	Place	Population	MS Cases	Prevalence	Confidence Interval
Fernández (1994)	Velez-Malaga	36.014	19	52.76	31.77–82.39
Bufill (1995)	Vic	72.000	42	58.33	42.04–78.86
Sempere (1995)	Segovia	53.774	30	55.79	37.44–79.65
Uria (1997)	Gijon	33.775	22	65.14	40.83–98.63
Pina (1998)	Calatayud	58.591	34	58.03	40.19–81.10
Tola (1999)	Valladolid	92.632	54	58.30	43.80–76.08
Hernández (1999)	La Palma	81.597	34	41.67	28.86–58.24

The difference of prevalence in the epidemiological studies using similar methodology on the Spanish Peninsular and on the Island of La Palma could reflect the existence of diverse environmental factors related to the geographical situation of the Archipelago. Genetic factors could also be of influence, although the racial or ethnic differences between people on the islands and the Spanish Peninsular have not been sufficiently evaluated.

In our case the methodology of our study allowed us to find new cases that had not initially been considered in the hospital-based files.

Using our methodology we think its possible to find most cases of MS, in a restricted population area with a good health system. Because of the clinical features of the disease, epidemiological studies of prevalence of MS must be based on multiple sources of information and need to be subject to long term follow-up. Sometimes patients try to hide their illness, mainly when they are referred to specialists outside their health area. The progressive improvement of the health system and the appropriate network of medical informants can lead to shortening of periods of study.

The figures of incidence found in Spain have oscillated between 0.49 and 2.9 [17–21]. In most publications, data of incidence are based on hospital records. In order to compare incidence data, the date of the onset of symptoms must be used, and not the date of diagnosis. The reason for this is that the date of diagnosis may be influenced by factors (diagnostic techniques, diagnosis criteria, number of specialists, general health of population, etc.). The studies of incidence in MS require longer

follow-up periods, at least 5 to 10 years [22]. We know that sometimes fluctuations of the incidence occur over the period of study and sometimes higher incidences during certain periods can be observed [23]. This could reflect a possible environmental factor related to the activation or reactivation of the immune mechanisms of the disease.

This study of the disease shows similar results to those found in other epidemiological studies carried out in Spain.

Conclusion

The prevalence of MS in the Island of La Palma is 42 cases/100,000. The incidence of MS during the studied period was 2.25 cases/100,000. The island of La Palma could be considered as an area of medium-high risk; Owing to the geographical latitude of the island this risk is higher than that expected. In this study, the hypothesis of the high prevalence of MS in Spain is confirmed; although on the island of La Palma this prevalence is higher than the prevalence found on the other islands in the archipelago. We have not found significant clinical differences in MS patients from those in other studies.

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