Economic impact and clinical profile of the Secondary Progressive Multiple Sclerosis (SPMS) patient: the DISCOVER study

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Introduction

- According to the Spanish Neurology Society (SEN), it is estimated that around 47,000 Spaniards suffer from multiple sclerosis (MS) and 16% of them suffer from Secondary Progressive MS (SPMS, around 7,250 patients).[1]
- Evolution from relapsing-remitting MS (RRMS) to SPMS represents a critical point in the disease, implying an inescapable progression of disability with fewer treatments available with enough capacity to modify the course of the disease. [2]
- MS symptoms lead to a general disability, impacting the quality of life of patients and also being related with an important economic burden on the National Health Systems (NHS), the patients, their caregivers and the whole society.[3]
- There a limited published data on the economic impact of SPMS considering the NHS, patient and society perspectives separately.

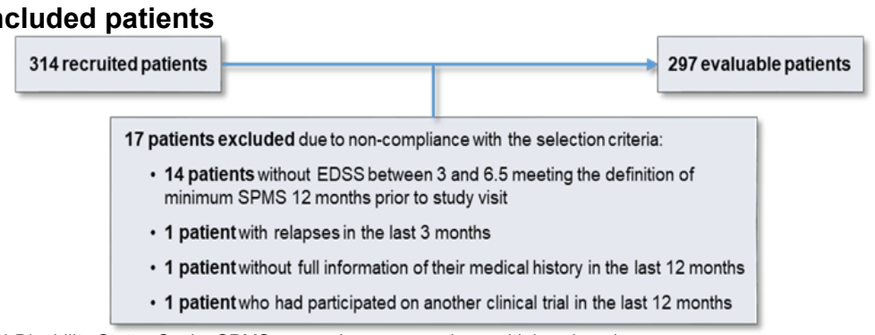
Objective

- To estimate the economic impact of SPMS in Spain.

Methods

- DISCOVER (CBAF312AES01) is an observational, non-interventional, cross-sectional, retrospective and multicenter study.
- Consecutive patients treated and monitored according to routine clinical practice were recruited in 34 public hospitals in Spain. All data were collected in one single visit.
- Primary endpoint was the total annual costs per patient from 3 perspectives:
  - Spanish NHS perspective: including direct costs.
  - Patient perspective: including pharmacological costs payed by patients and other direct health costs privately funded.
  - Societal perspective: including direct and indirect costs.
- Final results from 297 patients are presented (Figure 1).

Figure 1 Included patients



EDSS, Expanded Disability Status Scale; SPMS, secondary progressive multiple sclerosis

Results

Baseline sociodemographic and clinical characteristics

Table 1. Baseline sociodemographic characteristics

Characteristic	Total (N=297)
Age, years, mean (SD)	54.6 (9.4)
Sex, female, n (%)	185 (62.3%)
Education level, n (%)	
Without studies	4 (1.3%)
Primary education	81 (27.3%)
Secondary education	107 (36.0%)
Higher education	105 (35.4%)
Current familiar situation, n (%)	
Living alone (excluding caregiver)	34 (11.4%)
Living with a relative	263 (88.6%)

SD, standard deviation

Table 2 Crossover between the presence of relapses during the last 2 years and the presence of Gd+ lesions in T1

	- Gd+ lesions T1	+ Gd+ lesions T1	Gd+ lesions T1 ND	Total
Without relapses during the last 2 years, n (%)	226 (76.1%) [2]	10 (3.4%) [1b]	5 (1.7%) [3]	241 (81.1%)
With relapses during the last 2 years, n (%)	39 (13.1%) [1a]	6 (2.0%) [1a]	-	45 (15.2%)
Relapse information ND	9 (3.0%) [3]	1 (0.3%) [1b]	1 (0.3%) [3]	11 (3.7%)
Total	274 (92.3%)	17 (5.7%)	6 (2.0%)	297 (100%)

[1a + 1b] patients with active disease (n=56); [1a] with relapses 2 years previous +/- Gd+ lesions in T1(n=45); [1b] without relapses 2 years previous o no information + Gd+ lesions T1 (n=11); [2] patients with inactive disease (n=226); [3] disease activity not determined (n=15)
ND, not determined

Table 3 Baseline clinical characteristics

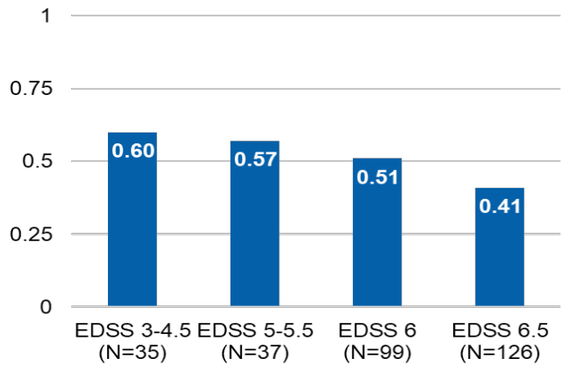
Characteristic	n	Mean (SD)	n (%)
Time since first diagnosis, years	296	19.1 (9.0)	
Time since progression to SPMS, years	297	5.9 (5.3)	
EDSS score at diagnosis	147	2.0 (1.2)	
EDSS score at the time of progression	296	5.1 (1.1)	
EDSS score at the study visit	297	5.9 (0.8)	
EDSS>6	297		126 (42.4%)
Active patients	297		31 (10.4%)
Patients who reduced hours due to MS	297		8 (2.7%)
Patients with permanent impairment	297		14 (4.7%)
Patients with impairment related to MS	297		14 (4.7%)
Non-active patients	297		266 (89.6%)
Patients with incapacity for work	297		189 (63.6%)
Patients who lost their job due to MS	297		4 (1.3%)
Patients with incapacity related to MS	297		183 (61.6%)
SDMT below the mean by age and educational level	292		231 (79.1%)

EDSS, Expanded Disability Status Scale; Gd, gadolinium; MS, multiple sclerosis; SD, standard deviation; SDMT, Symbol Digit Modalities Test; SPMS, secondary progressive multiple sclerosis

Impact of SPMS on patient's quality of life

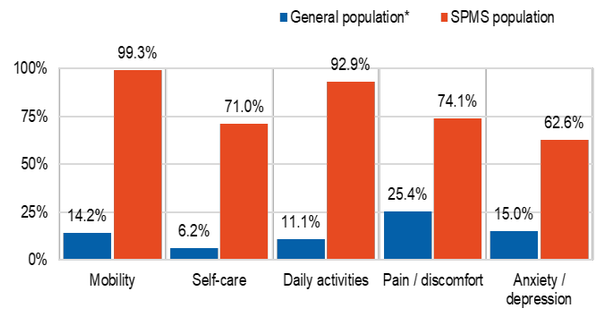
- Health related quality of life (HRQoL) had a negative correlation with EDSS score meaning that more severe stages of the disease result in a worse HRQoL (Figure 2).
- Regarding overall health state, measured through the generic questionnaire EQ-5D-5L, at the time of the study visit mobility problems were observed in 99.3% of SPMS patients and 92.9% reported problems to carry out their daily activities (Figure 3).

Figure 2 Impact of EDSS on EQ-5D-5L index value



Mean values and standard deviation shown
EDSS, Expanded Disability Status Scale; EQ-5D-5L, EuroQoL 5 Dimensions 5 Levels

Figure 3 Percentage of SPMS patients reporting problems according to the EQ-5D-5L dimensions vs general population



*Source: Encuesta Nacional de Salud. España 2011/12. Serie Informes monográficos nº 3. Calidad de vida relacionada con la salud en adultos: EQ-5D-5L. Ministerio de Sanidad, Servicios Sociales e Igualdad. Madrid 2014.

Economic impact of SPMS

- Total annual cost per patient reached up to 41,449 € (Figure 4).
- Low direct non-health costs may be related with the fact that 88.6% of the sampled patients in Spain were living with a relative (indirect caregiver).
- All types of costs had a positive correlation with EDSS score meaning that more severe stages of the disease result in a higher use of resources. Specifically, EDSS showed a correlation of 0.06837 with direct healthcare resources, 0.27422 with direct non-healthcare resources, 0.22669 with indirect resources and 0.22246 with total costs (Figure 5).

Figure 4 Total annual SPMS cost per patient by perspective and type of costs

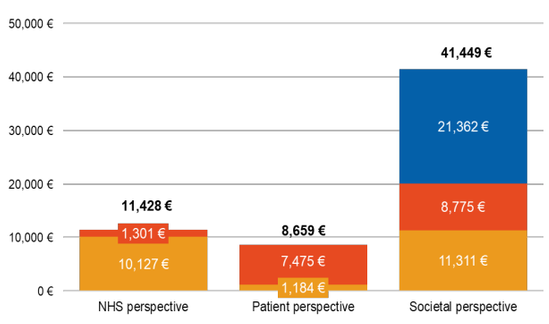
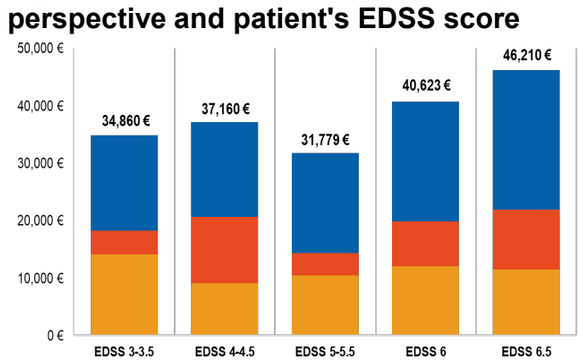


Figure 5 Total annual SPMS costs by perspective and patient's EDSS score



Direct healthcare resources Direct non-healthcare resources Indirect resources

Direct health resources include [illegible] nents, other treatments, other.
Direct non-health resources include mobility aids, vehicle/home adaptations, home help, non-relative caregiver, transportation.
Indirect costs include patient and caregiver (when available) short- and long-term work absences and unemployment, permanent disability, early retirement, absenteeism, presenteeism, reduction of work hours, loss of leisure time, activities and expenditures.
EDSS, Expanded Disability Status Scale; NHS, National Health System; SPMS, Secondary Progressive Multiple Sclerosis

Conclusions

- SPMS is associated with a high loss of work productivity, with most patients being unemployed for reasons related to MS.
- Disease progression negatively impacts the patient´s HRQoL and increases the total annual cost per patient/year.
- An economic burden of 41,449 € per patient/year was attributable to SPMS in Spain, indirect costs representing the 51.5% of the total.
- DISCOVER study revealed a significant economic impact of MS progression, highlighting the importance of implementing therapeutic strategies specific for SPMS patients within the early stages of progression.

References

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Disclosures

COG has participated in advisory boards for Novartis; **JR** has received speaking honoraria and personal compensation for participating on advisory boards from Novartis, Biogen-Idec, Genzyme, Merck- Serono, Teva, and Sanofi-Aventis; **JRAC** has received honoraria for lecturing, travel expenses for attending meetings, or financial support for research from Biogen Idec, Merck Serono, Genzyme and Novartis; **MAHP** has received compensation from any commercial entity (for-profit business) from Biogen, Novartis, Roche, Merck, Teva and Genzyme-Sanofi; **JGG** has received compensation from Almirall, Bayer, Biogen, Genzyme-Sanofi, Novartis, Roche and Teva; **AMAT** has participated in advisory boards for Novartis, Merck and Roche; **SEM** has received speaker honoraria and consultant fees from Biogen, Novartis, Sanofi Genzyme, Merck, Almirall, Roche and Teva; **BCE** has received research support or personal compensation from any commercial entity from Biogen, Sanofi, Roche, Merck, Teva, Novartis, Celgene and Almirall; **SMY** has received honoraria compensation from Biogen Idec, Novartis, TEVA, Merck Serono, Genzyme, Almirall and Roche; **AV** has had commercial relationship with Merck, Novartis, Biogen, Roche, Teva and Genzyme-Sanofi; **MLMG** has received compensation for consulting services and speaking fees from Merck, Biogen, Novartis, Sanofi-Genzyme, Almirall, Roche and Teva; **YEBM** has received speaker honoraria from Biogen, Bayer, Sanofi-Genzyme, Merck, Roche and Novartis; **AMLR** has participated as a speaker for Biogen Idec, Roche, Merck, Sanofi-Genzyme and Novartis; **JEMR** has had investigational/consulting relationship with Novartis, Roche, Merc-Serono, Actelion, Celgene, Biogen Idec and Sanofi-Genzyme; **LCF** has received consulting compensation and speaker fees from Merck, Bayer, Biogen Idec, Novartis, Sanofi-Genzyme, Almirall, Roche, Celgene, Biopas, Ipsen and Teva; **MGR** has received honoraria for scientific sessions by Biogen, Merck and Sanofi; **AL** has received speaker honoraria from Biogen Idec, Novartis, Roche, Genzyme and Merck; **JAGM** has received compensation for scientific advisory board and consulting from Novartis, Merck, Roche, Emerald, Biogen and Sanofi and research support from Teva; **CMF** has participated as an investigator in observational studies for Sanofi, Novartis and Merck; **TCT** has received speaking/consulting fees and/or travel funding from Bayer, Biogen, Merck, Novartis, Roche, Sanofi-Genzyme and Teva; **JPM** has received speaker honoraria and compensation fees by Sanofi, Novartis, Roche, Almirall, Teva, Merck and Biogen; **ARA** has received personal compensation from any commercial entity (for-profit business) from Merck, Biogen Idec, Roche, Genzyme, Teva, Myland and Celgene; **JMPG** has received consultant fees and/or grants for research projects from Bayer, Biogen Idec, Genzyme, Merck Serono, Novartis, Sanofi-Aventis, Teva, Roche and Almirall; **EAM** has participated as cientific advisor and/or received speaker honoraria from Novartis, Sanofi-Genzyme, Roche, Biogen, Bayer and Merck Serono; **IPM** has received personal compensation from Roche, Teva and Merck; **DMSS** has received speaker honoraria from Almirall, Biogen, Merck, Novartis, Roche, Sanofi and Teva; **JEML** has received grants and consulting or speaking fees from Almirall, Biogen, Celgene, Genzyme, Merck, Novartis, Roche and Teva; **BPF, LRT, FGG, VGQ, CLS, FCP, VML** and **NHV** have nothing to disclose.

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