Treatment adherence and costs in multiple sclerosis: a narrative review of the literature

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INTRODUCTION

The socioeconomic burden of multiple sclerosis (MS) is substantial, being the annual total cost estimated in Spain (2011) 259€ millions[1]. Disease-modifying therapy (DMT) for MS focuses on disease management to prevent and treat relapses and slow disease progression[2]. Adherence to DMTs has been associated with fewer relapses, as well as with less health care resource use and lower costs[3].

OBJECTIVES

The aim of the literature review is to appraise the publications relating adherence and other patients' outcomes (PROs) to MS costs.

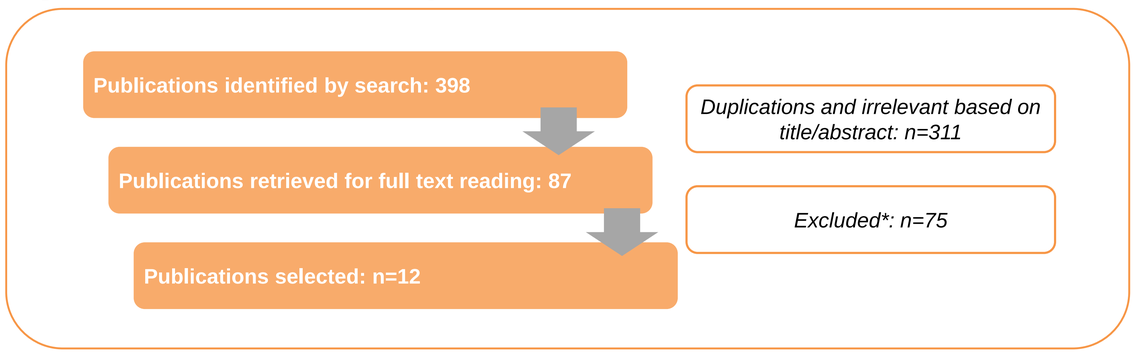
METHODS

- Electronic database (MedLine/PubMed, Google Scholar) and Congress proceedings were searched to identify publications analyzing MS costs related to PROs. Bibliographic references were hand searched. English or Spanish studies published between January 2007 and January 2013 were selected.
- Costs were updated to Euros 2013.

RESULTS

- The search strategy resulted in 398 citations. 311 of them were excluded as duplicate or clearly not relevant. After inclusion/exclusion criteria application, 12 studies were included. Six referred to PROs and treatment cost; four publications analyzed satisfaction with DMTs and two assessed preferences for treatment attributes **(Figure 1)**.

Figure 1. Flow-chart summary of literature search

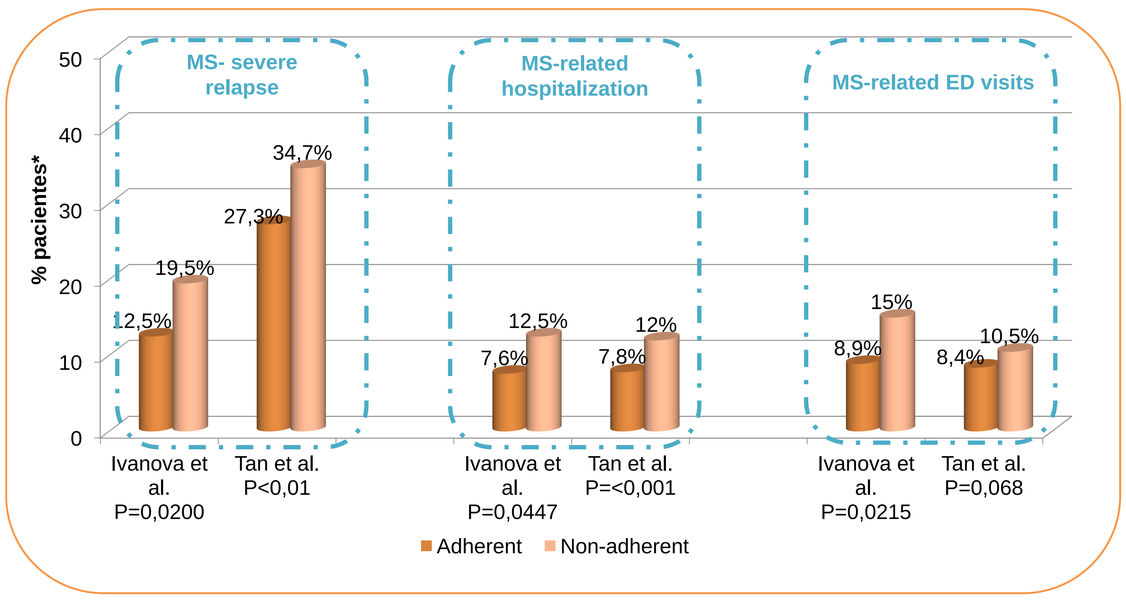


*Excluded by: no cost estimation (48 publications), cost no related to adherence or persistence (13 publications), cost-effectiveness or cost-utility analysis comparing treatment (8 publications) and no related to DMTs or its devices (6 publications).

MS cost related to DMT adherence and persistence

- An increased adherence on DMTs was associated to better clinical outcomes including lower risk for relapse (OR=0.71; 95% CI: 0.59-0.85)[4,5].
- Patients who were adherent were significantly less likely to experience an MS-related inpatient hospitalization (OR=0.63; 95% CI: 0.47-0.83) and MS-related emergency department (ED) visit (OR=0.80; 95% CI: 0.60-1.07) than those who were non-adherent **(Figure 2)** [4,5].

Figure 2. Comparison between % of patients adherents and non-adherents with at least one sever MS relapse, inpatient visit and ED visits during one year



*Adapted from Tan et al., 2011[5] and Ivanova et al., 2012[6]

- Compared to DMT non-adherent patient, Ms-related and all-cause inpatient cost, as well as emergency visit costs were significantly lower in adherent patients **(Table 1)**[5].

Table 1. Comparison DMT adherent and DMT non-adherent two-year period direct and indirect cost*

	DMT adherent Mean € (SD)	DMT non-adherent Mean € (SD)	P-value
MS-related direct costs (excluding DMT)	**4,824.58 (7,208.43)**	**5,145.82 (8,240.16)**	**0.4858**
Inpatient cost	354.77 (2,485.03)	853.13 (3,635.48)	0.0270*
ED cost	46,46 (255,94)	62.51 (265.23)	0.0076*
All-cause direct cost (excluding DMT)	**9,337,82 (1,1816.55)**	**10,312.19 (13,186.48)**	**0.8753**
Impatient cost	648,71 (3,753.74)	1,740.88 (6,127.27)	0.0018*
ED cost	147,82 (430.79)	242.42 (592.96)	0.0044*
Indirect cost	**3,012.15 (7.745,70)**	**3,522.44 (8,056.07)**	**0.9010**
Total cost (excluding DMT)	**12,349.96 (16,335.92)**	**13,834,63 (18,821.20)**	**0.7131**

Adapted from Ivanova et al[5].

- Despite higher pharmacy costs associated with increased adherence rate, patient outcomes were improved leading to a cost reduction of up to 22% patient/year .
- Patients with Medication Possession Ratio (MPR) of at least 0.5 had significantly lower total impatient and ER charges, compared to individual who did not reach such threshold. As the MPR threshold increase, this impact became larger **(Table 2)**.[6]

Table 2. Incremental effect associated to MPR threshold

MPR threshold	Inpatient		Outpatient		ED	
	Incremental effect	P value	Incremental effect	P value	Incremental effect	P value
0.25	-841.98	0.435	-974,02	**0.009**	54.77	0.120
0.50	-2,665.57	**0.002**	851,93	**0.004**	75.89	**0.006**
0.80	-4,7833.08	**<0.001**	873,16	**0.003**	63.95	**0.022**
0.95	6,728.72	**<0.001**	1,0297	**0.001**	87.51	**0.05**

*Adapted Oleen-Burkey et al., 2011[6]

Treatment satisfaction and patient's preferences for attributes of DMTs delivery devices

- Self-injection (mean VAS: 6.9; range: 0-10) render higher treatment satisfaction than prefilled syringe (mean VAS: 6.7; range: 0-10) or vial and syringe (mean VAS: 5.9; range: 0-10) [7].
- The attribute of 'Disability', explained as a progression by on level on MS scale had the largest impact on patients preference (Mean (SD): -2.145 (2.148); 95% CI: -2.701,-1.588); P<0.000; OR=0.117; 95% CI: 0.067, 0.204)[8].
- Reducing the discomfort associated with device with the addition of tailor injection settings to individual needs and reminder and time-stamping functions, make feel patients more comfortable, which could lead to increase adherence rates[7].
- Newly developed electronic devices that allow adjusting injection setting as well as adherence objective monitoring appeal more to patients than more traditional methods of administration (VAS mean 7.7; range 0-10)[7].

CONCLUSION

- **MS studies assessing adherence and costs are scarce.**
- **An increased adherence on DMTs was associated to better clinical outcomes including lower risk for relapse as well as to minor probability of experiencing MS-related inpatient hospitalization and MS-related ER than those who were non-adherent.**
- **Despite higher pharmacy costs associated with increased adherence rate, patients outcomes were improved leading to a cost reduction of up to 22% patient/year.**
- **Treatments and devices better tailored to patients' needs improve adherence, enhance clinical outcomes and procure a reduction on MS costs.**

BIBLIOGRAPHY

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