Epidemiology, Patients' Characteristics and Treatment Switch: Recent Data from the Italian Multiple Sclerosis Registry

Nica M.[1], Iaffaldano P.[2], Trojano M.[2]

[1]Novartis Farma Italy, Origgio (VA), Italy; [2]University of Bari Aldo Moro, Universitary Policlinico Hospital.

Rationale

MS may present in several phenotypes; however, approximately 85% of people with MS are initially diagnosed with the relapsing form of MS (RMS), typically between the ages of 20 and 40 years [1] [2].
The different phenotypes have different characteristics in terms of patients' characteristics, journey and treatment. The Italian MS Registry is a very important source of real world data that may help actualize epidemiology, patients' features and treatment pathways.

Objectives

This study aims at assessing the prevalence, clinical and therapeutic characteristics of the RMS, RRMS and SPMS patients in the Italian Multiple Sclerosis Registry (IMSR), at evaluating the percentage of patients that switch the DMTs due to changes in the disease activity (relapses and/or evidence of new MRI activity in the 2 years before data extraction) and at describing the different drivers of the therapy switch that occur during the disease course.

Methods

Study design

This is a retrospective cohort study with secondary use of data (SUD), on the patient population present in the Italian MS Registry on December 31-st 2019.
Variables registered:

1. MS patients' demographics and disease course characteristics:

- age at onset and age at the time of data extraction
- gender
- co-morbidities
- MS first diagnosis
- MS disease duration
- RRMS or SPMS date of diagnosis
- number of MS relapses per year (Annualized relapse rate and total relapses)

2. DMTs treatment patterns:

- switch of the treatment and reason
- discontinuation of the treatment and reason
- add-on treatment and reason

3. EDSS score evolution throughout the MS course

Setting

Data collected from the Italian Multiple Sclerosis Registry.
The study setup is meant to identify:

Type of MS Patient Population	Patients' clinical characteristics	Clinical and/or MRI activity	Disease modifying treatment
All RRMS	✓		✓
Active RRMS	✓	✓	✓
All SPMS	✓		✓
Active SPMS	✓	✓	✓
All RMS	✓		✓

We have considered all patients present in the IMSR on December 31-st 2019

Results

Among the MS patients recorded in the registry with a follow-up duration of at least 5 years we identified 17,013 RRMS patients and 575 SPMS patients; using a clinical definition of active RRMS and active SPMS we have identified 4,161 (19.7% of the total RRMS cohort) and 578 (50.1% of the total SPMS cohort) patients with an active disease phenotype. Patients with an active disease were significantly younger, less disabled and more frequently affected by a relapsing disease course (89.8% vs 85.2%, p<0.0001) in comparison to not active patients.
We also assessed the different drivers of the therapy switch that occur during the disease course. Our results highlight the strong efficacy of second line DMTs in reducing the risk of clinical disease activity during both the RR and the SP phase of the disease.

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VARIABLE	Not active RRMS (n=17,013)	Active RRMS (n=4,161)	Not active SPMS (n=575)	Active SPMS (n=578)
Age at the last visit, years, median (IQR)	41.60 (33.50-49.90)	37.30 (29.90-45.60)	45.90 (39.50-54.20)	42.00 (34.90-49.00)
Female sex, n (%)	11,426 (67.16)	2,909 (69.91)	334 (58.09)	367 (63.49)
Patients with comorbidities, n (%)	403 (2.37)	99 (2.38)	24 (4.17)	19 (3.29)
EDSS score, median (IQR)	1.50 (1.00-2.50)	2.00 (1.00-3.00)	4.50 (4.00-5.00)	4.50 (4.00-5.00)
Time to SP conversion (or censoring time for RRMS patients not converted to SP), years, median (IQR)	7.75 (4.22-12.94)	5.43 (2.71-10.06)	8.20 (4.76-12.90)	6.05 (3.23-10.54)
Time from disease onset to first DMTs sstart, years, median (IQR)	0.87 (0.38-1.90)	0.93 (0.43-1.93)	1.80 (0.84-3.08)	1.51 (0.76-2.88)
Last DMTs recorded, n (%)				
Teriflunomide	984 (5.78)	236 (5.67)	14 (2.43)	10 (1.73)
Azatioprina	304 (1.79)	56 (1.35)	54 (9.39)	35 (6.06)
Dimethyl fumarate	2,865 (16.84)	664 (15.96)	29 (5.04)	23 (3.98)
Glatiramer Acetate	2,008 (11.80)	414 (9.95)	67 (11.65)	58 (10.03)
Fingolimod	1,739 (10.22)	496 (11.92)	57 (9.91)	57 (9.86)
Natalizumab	1,538 (9.04)	494 (11.87)	47 (8.17)	53 (9.17)
Interferon-beta products	4,504 (26.47)	847 (20.36)	183 (31.83)	199 (34.43)
Ocrelizumab	499 (2.93)	261 (6.27)	6 (1.04)	5 (0.87)

Figure 1. Multivariate logistic regression model evaluating the Odds ratio for being a DMT switcher

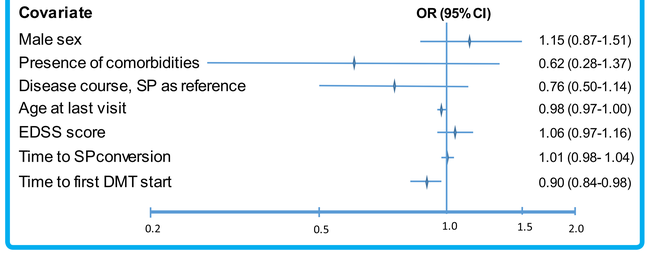
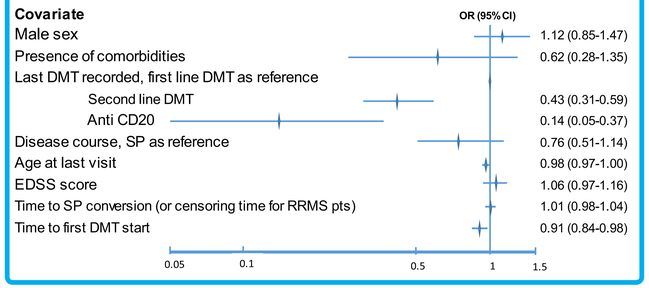


Figure 2. Multivariate Logistic Regression model evaluating the Odds ratios for being a DMT switcher (DMT exposure: last recorded DMT class)



Conclusion

This study assessed clinical and therapeutic characteristics of the MS patients in the Italian Multiple Sclerosis Registry, evaluating the percentage of patients that switch the DMTs due to changes in the disease activity. Our results highlight the strong efficacy of second line DMTs. Since the Italian Multiple Sclerosis Registry covers about 60% of the Italian MS population, our data could be considered highly generalizable and able to interpret MS population. Our findings indicate that the presence of clinical disease activity is an important trigger of the treatment switch both in RRMS and in SPMS patients. Moreover, our results highlight the strong efficacy of second line DMTs in reducing the risk of clinical disease activity during both the RR and the SP phase of the disease.

References

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