Understanding Patient Demographics, Clinical Characteristics, Economic Outcomes and Treatment Patterns in People with Nonrelapsing Secondary Progressive Multiple Sclerosis: A Retrospective Cohort Study in the United States

P418

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BACKGROUND

- Secondary progressive multiple sclerosis (SPMS) is characterized by irreversible disability progression and develops in approximately 50% of people initially diagnosed with relapsing-remitting multiple sclerosis[1,2]
- People with SPMS who do not experience further relapses but continue to have disability accumulation are classified as having nonrelapsing SPMS (nrSPMS)[3]
- At present, limited data are available on the clinical and economic outcomes, as well as treatment patterns in the nrSPMS population

OBJECTIVE

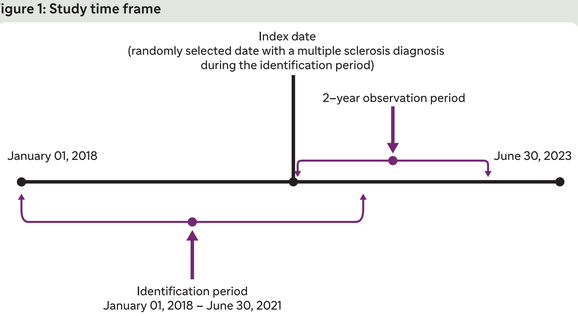
- To assess the real-world clinical and economic outcomes, and treatment patterns in people with nrSPMS in the United States (US)

METHODS

Study design and population

- A retrospective cohort study was conducted using a large, integrated US-based administrative claims database from January 01, 2018, to June 30, 2023 (**Figure 1**)
- People with nrSPMS were identified based on specific inclusion criteria using a claims-based algorithm[4] during the identification period, i.e., from January 01, 2018 through June 30, 2021 (**Figure 2**)
- People with nrSPMS were followed for 2 years after the index date and were required to be continuously enrolled in a health plan throughout the observation period
- The index date was defined as a randomly selected date on which an MS diagnosis was recorded during the identification period

Figure 1: Study time frame



Study measures

- Baseline demographics, Charlson Comorbidity Index (CCI), Kurtzke Functional Systems (KFSS)-adapted disability score, specific comorbidities of interest, and treatment patterns were assessed over the 2-year observation period
- Healthcare resource utilization (HCRU) and healthcare costs (HCCs) were also evaluated, which comprised of inpatient admissions, emergency department (ED) visits, non-ED outpatient service visits, medical and pharmacy costs, cost of infections, and use of specific healthcare services

Statistical analysis

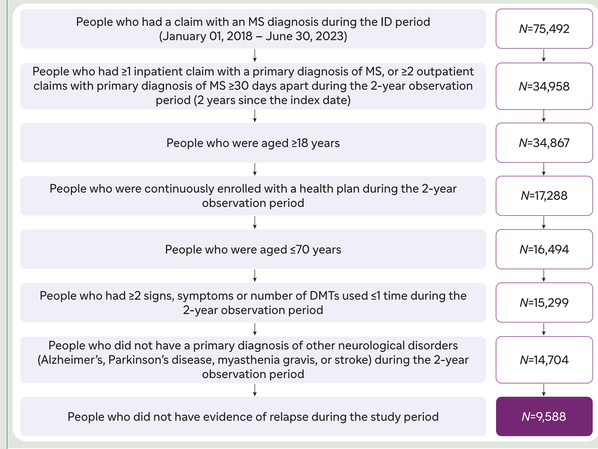
- Study measures were summarized using descriptive statistical methods
- All costs were reported in US dollars (adjusted to Year 2023)

RESULTS

Baseline demographics

- A total of 9,588 people with nrSPMS were included, with a mean (standard deviation [SD]) age of 48.9 (10.6) years
- Most participants were female (74.8%) and covered by commercial insurance (93.3%)

Figure 2: Attrition chart for the identification of nrSPMS cohort in claims database

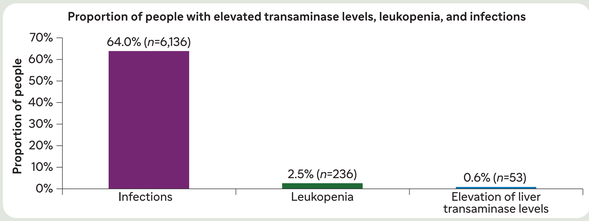


N is the total study population.
DMT, disease-modifying therapy; ID, identification; MS, multiple sclerosis; nrSPMS, nonrelapsing secondary progressive multiple sclerosis.

Clinical characteristics

- The mean (SD) KFSS-adapted disability score was 2.3 (2.4)
  - Among people with nrSPMS, 57.7% (*n*=5,529) were classified as mild (KFSS 0–2.5), 34.6% (*n*=3,313) as moderate (KFSS 3.0–5.5), and 7.8% (*n*=746) as severe (KFSS ≥6.0)
- Infections were common, occurring in 64.0% of people with nrSPMS (**Figure 3**)

Figure 3: Proportion of people with infections, leukopenia, and elevated liver transaminase level in the nrSPMS cohort

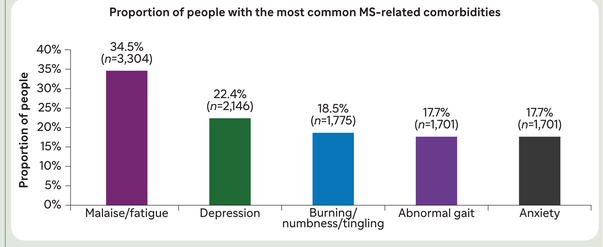


Data presented as the percentage of people. *n* is the subset of people with nrSPMS.
nrSPMS, nonrelapsing secondary progressive multiple sclerosis.

Specific comorbidities of interest

- The mean (SD) CCI score was 0.7 (1.3)
- MS-related comorbidities were reported in 78.8% (*n*=7,553) of people with nrSPMS. The top five most common MS-related comorbidities were malaise/fatigue, depression, burning/numbness/tingling, abnormal gait, and anxiety (**Figure 4**)
- Other comorbidities were reported in 64.4% (*n*=6,175) of people with nrSPMS, while autoimmune comorbidities and urinary tract infections were observed in 18.9% (*n*=1,816) and 13.9% (*n*=1,332), respectively

Figure 4: Most frequent MS-related comorbidities in the nrSPMS cohort

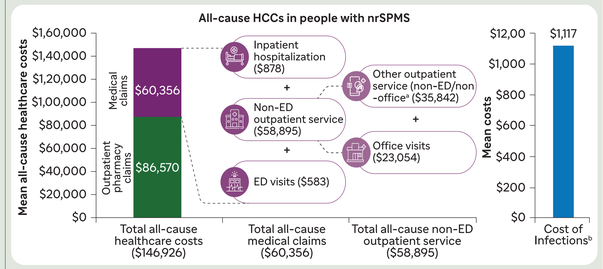


Data presented as the percentage of people. *n* is the subset of people with nrSPMS.
MS, multiple sclerosis; nrSPMS, nonrelapsing secondary progressive multiple sclerosis.

Healthcare resource utilization and healthcare costs

- By the end of the 2-year observation period, all-cause hospitalization occurred in 2.2% (*n*=215) of people with nrSPMS, whereas, 22.7% (*n*=2,176) had ED visits
  - For hospitalized individuals, the mean (SD) length of stay was 5.7 (10.0) days
- Use of occupational and physical therapies were reported in 33.4% (*n*=3,206) and 26.9% (*n*=2,583) of people with nrSPMS, respectively, whereas 20.1% (*n*=1,926) of people required ambulatory devices
- The mean total all-cause HCC was $146,926, with outpatient pharmacy ($86,570) and medical claims ($60,356) being the major cost contributors. The mean all-cause costs attributable to infections was $1,117 (**Figure 5**)

Figure 5: Healthcare costs in people with nrSPMS cohort

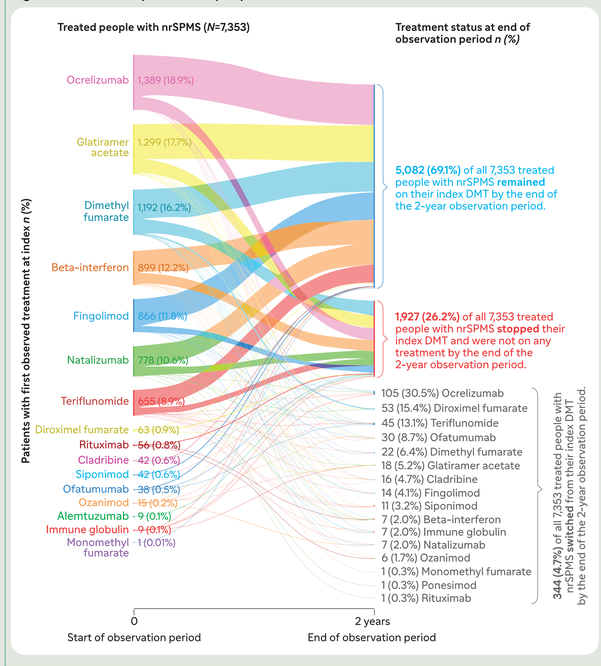


Data presented as the mean cost.
[a]Includes outpatient hospital, lab, home care, and telehealth, which together account for about 90% of other outpatient services.
[b]Defined as costs of medical claims with a diagnosis of infections in any field plus the costs of antibiotics or antivirals pharmacy claims with days of supply <21 days filled within 7 days of an infection medical claim.
ED, emergency department; HCC, healthcare costs; nrSPMS, nonrelapsing secondary progressive multiple sclerosis.

Treatment patterns

- At index, 7,337 (76.5%) people with nrSPMS were on disease-modifying therapy (DMT) and 2,235 (23.3%) were not on any DMT
- Ocrelizumab (15.6%), glatiramer acetate (13.8%), and dimethyl fumarate (12.7%) were the top three most commonly utilized DMTs by the end of observation period
- Among the treated nrSPMS population (*n*=7,353), 69.1% continued their index DMT through end of the 2-year observation period, 26.2% discontinued treatment, and 4.7% switched to another DMT by the end of the 2-year observation period (**Figure 6**)

Figure 6: Treatment patterns in people with nrSPMS



Data presented as *n* (%) *N* is the total study population. *n* is the subset of people.
DMT, disease-modifying therapy; nrSPMS, nonrelapsing secondary progressive multiple sclerosis.

LIMITATIONS

- As with all claims database analyses, this study is subject to potential miscoding that may affect patient identification
- Results may not be generalizable to uninsured populations or patients aged >65 years, who are under-represented in commercial claims data

CONCLUSIONS

People with nrSPMS exhibit a high burden of comorbidities, HCRU, and HCCs, highlighting a significant clinical and economic burden. These findings underscore the urgent need for targeted and effective treatment options, as no approved therapies currently exist for this population

Disclosures
Nupur Greene: Employee of Sanofi and hold stock options in the company.
Ashis K. Das, Eunice Chang, Marian H. Tarbox, and Michael S. Broder: Employees of PHAR (now a part of ADVI Health), which was paid by Sanofi to conduct the research described in this abstract. PHAR also discloses financial relationships with the following commercial entities outside of the submitted work: Akcea, Amgen, Celgene, Delfi Diagnostics, Dompe, Exact Sciences Corporation, Genentech, Gilead, GRAIL, Greenwich Biosciences, Ionis, Nobelpharma, Novartis, Pardes, Prothena, Pfizer, Recordati, Regeneron, Sanofi US Services, and Sunovion.

Acknowledgments
Medical writing support and editorial assistance were provided by Pragya Sinha and Shreya Dam of Sanofi. Planning, review, and coordination assistance was provided by Leah Granby.

Funding
This study was sponsored by Sanofi.

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Poster presented at the Americas Committee for Treatment and Research in Multiple Sclerosis (ACTRIMS) Forum 2026; San Diego, California, USA; February 05–07, 2026.