However, many patients with SPMS no longer experience relapses, which can be termed nonrelapsing. 

90% of SPMS patients are nonrelapsing. 

15,370 (78.2)

87% of SPMS patients are nonrelapsing. 

3,534 (17.9)

Algorithm 3, 3,529 (17.9) patients benefited from currently approved DMTs.

Given this need and disease burden on the patients, an in-depth understanding of nrSPMS is important, particularly in the U.S.

While there is one ICD-10 code for MS, there are no codes for specific MS phenotypes, including none for nrSPMS or the NRSPSMB.

**OBJECTIVE**

This study aimed to develop a validated algorithm capable of identifying adult patients with nrSPMS in U.S.-based electronic health records (EHR) or claims datasets.

**METHODS**

- **Study aim:** Develop an algorithm capable of identifying patients with nrSPMS and tested this in two data sources – patient medical records (including billing records) and a large commercial database (Figure 1).

- **Study design:** Case–control study. 

- **Inclusion criteria:** All inpatient visits and ≥2 associated outpatient visits with a discharge diagnosis of MS 

- **Exclusion criteria:** An ICD-10 code for MS, NMD, or MS diagnosis recorded in any outpatient visit between 1/1/2016 and 12/31/2018. 

- **Study population:** Population aged 18-70 years.

- **Main outcome measures:** Incidence rate of nrSPMS patients. 

- **Study endpoints:** A diagnostic algorithm capable of identifying nrSPMS patients and future studies using our algorithms will likely explore healthcare cost. 

- **Study limitation:** Cost was not included in the algorithms as it was not identified as a significant criteria in identifying nrSPMS patients.

- **Conclusion:** This algorithm can be used to study the incidence rate of nrSPMS patients and may be used by payers and policymakers to inform healthcare strategies for this patient population.

**RESULTS**

- **Diagnostic algorithms** included the following criteria:

- **Algorithm 1:** 
  - No. of DMT use ≤1
  - No outpatient visit with MS diagnosis AND discharge diagnosis of other neurological disorders
  - No inpatient hospitalization with a diagnosis of MS
  - Receiving ICU care

- **Algorithm 2:** 
  - No. of DMT use ≤1
  - No outpatient visit with MS diagnosis AND discharge diagnosis of other neurological disorders
  - No inpatient hospitalization with a diagnosis of MS
  - Receiving ICU care

- **Algorithm performance:**

- **Algorithm 1** 
  - PPV: 86% 
  - NPV: 86%

- **Algorithm 2** 
  - PPV: 90% 
  - NPV: 90%

- **Algorithm 1 missed fewer patients with nrSPMS in IQVIA database compared to algorithm 1.**

While both algorithms 1 and 2 were specific (patients identified with either are likely to have nrSPMS), algorithms were compared to published clinical studies and with patient medical records collected in this study.

**CONFLICTS OF INTEREST**

**REFERENCES**

**FUNDING**

**ACKNOWLEDGMENTS**

**CONCLUSIONS**

The proposed algorithms showed high performance when tested in patient medical record data. 

Conclusively, the algorithms identified a subset of patients in nrSPMS data that were compared with clinically identified patients with nrSPMS (based on biologic and clinical criteria). These algorithms can be used in EHR or claims-based databases to facilitate further research to better identify and describe the nrSPMS population.