Algorithm-identified adult patients with NMOSD were required to have ≥1 year of follow-up. Excluding patients with MOGAD (n=80), mean (SD) age was 50.1 (16.5) years and 78.0% were female. Demographics and clinical characteristics were consistent with previously published studies. Whether these codes can be used to identify patients with NMOSD and distinguish them from patients with diseases similar to NMOSD (e.g. multiple sclerosis [MS] and myelin oligodendrocyte glycoprotein antibody–associated disease [MOGAD]) is unknown.

**OBJECTIVE**

To develop and test the performance of a healthcare claims-based algorithm to identify patients with NMOSD.

**METHODS**

- We developed algorithms of ICD-10-CM diagnosis codes and medications through structured cognitive interviews with neurologists.
- We tested algorithm sensitivity and specificity in the billing and medication data (as a proxy for a healthcare claims database) of a purposive sample of 101 adults with NMOSD, MS or MOGAD from 5 geographically diverse US neurology clinics to identify the best-performing algorithm.
- We repeated these calculations on a subset that excluded patients with MOGAD, a rare condition that was oversampled in this study.
- We then tested this algorithm’s face validity using 2016–2019 data from IBM MarketScan® Commercial and Medicare Supplemental databases.

- Algorithm-identified adult patients with NMOSD were required to have >1 year of continuous enrollment after acquiring a diagnosis code during the study period.
- Demographics and clinical characteristics were reported.

**RESULTS**

- In a purposive sample of patients with NMOSD, MS and MOGAD (n=101), the mean (SD) age of patients with NMOSD was 50.1 (16.5) years and 78.0% were female (Table 1).
- The best-performing algorithm is shown in Figure 1.
- In the billing and medication data, the algorithm had 82.0% sensitivity and 70.6% specificity in the full sample of patients (Figure 2).
- Excluding patients with MOGAD, specificity increased to 96.7%.
- When evaluated using claims data, the algorithm identified 382 patients with NMOSD.

**CONCLUSIONS**

- This clinically derived algorithm performed very well in identifying true positive and negative patients in clinic billing and medication records, with a sensitivity of 82.0% and specificity ranging from 70.6% to 96.7%.
- We used a purposive sample of patients with conditions that an ideal algorithm would screen out. To mimic healthcare claims data, our test data set did not include laboratory results and thus presented a very high bar for the algorithm.
- When tested in healthcare claims data, demographics and clinical characteristics were consistent with previously published clinical findings.

- This algorithm will enable a more accurate estimation of NMOSD disease burden (including comorbidities, cost and utilization) as well as a better understanding of treatment patterns in future healthcare claims analyses.

**DISCLOSURES**

A. Exuzides was an employee of Genentech, Inc., and shareholder of T. Hutchison Co. Ltd as at the time of the study and substantial owner. I. Venneti, H. Bargar, P.S. Gbadebo, S. Hwang, R. Apuzzo, E. Chang, C. Paydar, M.M. Broder et al. have nothing to declare.

Acknowledgments. This work was supported by funding from NIH, Alexion, Viela Bio, Genentech/Roche, UCB Pharmaceuticals, Mitsubishi Pharmaceuticals, Otsuka, Novartis, EMD Serono, Serono, Roche Genentech and Sanofi Genzyme; and has received consulting fees from AbbVie, Adamas, Biogen, Bristol Myers Squibb, DAIICHI SANKO, Daiichi Sankyo, Genentech, Inc., Genentech/Roche, ICB, Jansen, Janssen, Kyowa, Kurabou, Merck, Merck Sharp & Dohme, Mitsubishi, Novartis Pharmaceuticals, Otsuka, Pfizer, PMLFA, Protherics, Recordati, Roche, Sanoﬁ, Shionogi, Takeda and Zydus. A. Exuzides has received consulting fees from AbbVie, Genentech, Otsuka, PhRMA, Prothena, Recordati, Regeneron, Sanofi, Sanoﬁ, Shionogi, and Takeda and grants from Sanofi, Sanofi Genzyme and Sanofi-Aventis; and has been on the steering committee for ABBV, Genentech, Otsuka, PhRMA and Prothena.

**Algorithm performance**

**Figure 1.** Best-Performing Algorithm

**Figure 2.** Algorithm Performance in Billing and Medication Data

**Figure 3.** Demographics of Patients With NMOSD Identified in Claims Data (N=382)

**Figure 4.** Proportion of Patients With a Diagnostic Claim Code for NMO, ON or TM Among Patients With NMOSD Identified in Claims Data (N=382)

**Table 1.** Demographics of 101 Patients With NMOSD, MS or MOGAD (Medical Record Data)

**Table 2.** Development and Validation of a Claims-Based Algorithm to Identify Patients With Neuromyelitis Optica Spectrum Disorder

**Table 3.** Algorithm performance

**Figure 3.** Development and Validation of a Claims-Based Algorithm to Identify Patients With Neuromyelitis Optica Spectrum Disorder

**Table 4.** Algorithm performance

**Figure 4.** Development and Validation of a Claims-Based Algorithm to Identify Patients With Neuromyelitis Optica Spectrum Disorder

**Table 5.** Algorithm performance

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**Routine the 30th Congress of the European Committee for Treatment and Research in Multiple Skelral Disorders (CMTRM) 30-32 October 2022, Amsterdam, the Netherlands**

This study was funded by Genentech, Inc., a member of the Roche Group. Financial support, provided by Health Interactions, Inc., was funded by Genentech, Inc.