Background

- Neuromyelitis Optica Spectrum Disorder (NMOSD) is an antibody-mediated inflammatory disease of the central nervous system (CNS) that targets the optic nerves, spinal cord, area postrema and certain brain regions.
- NMOSD patients may be misdiagnosed with the more common condition of MS, given some shared signs/symptoms.
- Misdiagnosed NMOSD patients may be exposed to particular MS disease-modifying therapies (DMTs) that are ineffective or adverse in NMOSD.

Methods

- This is a post hoc analysis study with de-identified aggregate data utilizing TriNetX.
- TriNetX is a collaborative health research network providing access to electronic medical records, including sixty-one health care organizations (HCOs) in the US.
- 7657 patients with the ICD-10 code of NMOSD (G36.0) were queried within the database from 2008 to 2022.
- Of the total, 3617 patients had ICD-10 codes for both NMOSD and MS (G35.0).
- We included patients with at least 3 visits with the ICD-10 codes of G36.0 or G35.0 after initial diagnosis to increase diagnosis sensitivity (Figure 1).

Results

Table 1: Demographics of Identified Patients

<table>
<thead>
<tr>
<th>Race, n(%)</th>
<th>NMOSD Patients misdiagnosed as MS (n=308)</th>
<th>MS Patients misdiagnosed as NMOSD (n=189)</th>
<th>Patients diagnosed with MS and NMOSD interchangeably (n=768)</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>183 (59.4)</td>
<td>100 (52.9)</td>
<td>602 (78.4)</td>
</tr>
<tr>
<td>African American</td>
<td>2 (0.6)</td>
<td>2 (1.1)</td>
<td>2 (0.3)</td>
</tr>
<tr>
<td>Asian</td>
<td>6 (1.9)</td>
<td>2 (1.1)</td>
<td>15 (2.0)</td>
</tr>
<tr>
<td>Black</td>
<td>53 (17.2)</td>
<td>46 (24.3)</td>
<td>222 (28.9)</td>
</tr>
<tr>
<td>Unknown</td>
<td>64 (20.8)</td>
<td>39 (20.6)</td>
<td>122 (15.9)</td>
</tr>
</tbody>
</table>

Geographic Distribution, n(%):
- Midwest: 44 (14.3)
- Northeast: 83 (26.9)
- South: 130 (42.2)
- West: 38 (12.1)
- Unknown: 7 (2.3)

Years in the Healthcare system:
- Median (Range): 6.4 [1.5-36.8] for NMOSD and 5.5 [1.5 -36.4] for MS.
- Patients Alive (n%): 292 (94.8) for NMOSD and 179 (94.7) for MS.

Table 2: Frequency Measurement of three groups in TriNetX

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Accurately diagnosed NMOSD patients (n=4040)</th>
<th>NMOSD Patients misdiagnosed as MS (n=189)</th>
<th>MS Patients diagnosed as MS (n=132)</th>
<th>Patients diagnosed with MS and NMOSD interchangeably (n=553)</th>
</tr>
</thead>
</table>

Conclusion

- This is a large population-based study on patients with misdiagnosis of NMOSD or MS, providing insights into potential factors of misdiagnosis gaps nationwide.
- Of 7657 patients persistently coded as NMOSD, only 52.8% ultimately had the correct diagnosis of NMOSD, showing the importance of accurate diagnosis and coding by all clinicians.
- Patients are more likely to be diagnosed with MS/NMOSD interchangeably. This could be due to poor awareness amongst clinicians, healthcare utilization disruption/disparity, and/or seronegative NMOSD and otherwise complex presentations.
- NMOSD patients who are accurately diagnosed with NMOSD, have a higher median frequency of lumbar puncture than all misdiagnosed groups.
- Limitations: No availability of confirmatory CSF/serum serology for MS/NMOSD; Cross-sectional study limits the ability to determine the cause of misdiagnoses.

Acknowledgements

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