

Comparison of Symptoms, Treatments, and Healthcare Resource Utilization in Patients with Multiple Sclerosis by Sex in a Real-World Cohort in the United States

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Background

- Autoimmune diseases like multiple sclerosis (MS) disproportionately impact women.
- Research suggests MS susceptibility and relapses may differ due to mechanisms underlying sex differences in disability progression.
- Such differences may impact disease phenotypes, which in turn, increase need for clinical care and healthcare resource utilization (HRU).

Objective

To compare symptoms and HRU of MS patients identified from a large, representative database of linked EMR-claims data by sex.

Methods

- The OM1 Real World Data Cloud (OM1, Boston, MA) collects and links structured and unstructured data including extensive clinical and administrative claims data on patients from a variety of practice types across the US starting in 2013.
- This study included MS patients ages ≥ 18 on the index date defined as the earliest of first observed MS diagnosis or disease-modifying therapy (DMT) initiation who had 12 months of data available after the index date (observation period).
- MS symptoms (by diagnosis codes), treatments, and HRU were assessed during the observation period and stratified by sex with significant differences defined as $p < 0.05$ from chi-square tests.

Results

- As of November 2019, 306,607 MS patients met inclusion criteria. Mean age was 50.6 years (SD: 13.1), 76.6% were female, and 85.8% of patients with known race were white. Baseline demographic characteristics by sex are displayed in **Table 1**.
- A higher proportion of males vs. females had evidence of the following signs and symptoms during the observation period (all $p < 0.001$): gait abnormality (13.8% vs. 11.7%), muscle weakness (10.5% vs. 9.0%), ataxia (4.7% vs. 3.6%), sexual dysfunction (6.1% vs. 0.04%), and urinary retention (6.9% vs. 3.8%; **Figure 1**).
- In contrast, a higher proportion of females vs. males experienced the following (all $p < 0.001$): depressive disorder (21.7% vs. 16.5%), burning, numbness, or tingling (13.1% vs. 11.1%), fibromyalgia/myalgia and myositis (7.9% vs. 3.4%) and malaise and fatigue (20.9% vs. 18.5%; **Figure 1**).
- Males were more likely to have an all-cause hospitalization (20.4% vs. 18.4%, $p < 0.001$) and an MS-related hospitalization (16.7% vs. 14.8%, $p < 0.001$). Females were more likely to have an all-cause emergency room (ER) or urgent care visit (21.9% vs. 20.6%, $p < 0.001$). There was no significant difference between sexes for MS-related ER or urgent care visits (**Figure 2**).
- More females used steroids (12.0% vs. 10.0%, $p < 0.001$), while more males used a DMT (22.2% vs. 21.8%, $p = 0.014$; **Figure 3**).

Conclusions

- Depression and sensory-related symptoms were more common in women, while men were more likely to have symptoms related to impaired coordination and urinary and sexual dysfunction. Both groups experienced muscle-related symptoms.
- While initial analyses indicate differences in HRU by sex, research is needed to characterize the impact on the clinical and economic burden of MS.

Table 1. Baseline demographic characteristics by sex

| | Female (N=234,964) | Male (N=71,643) |
|------------------------------|-----------------------|--------------------|
| Age, mean (SD) | 50.4 (13.1) | 51.0 (13.4) |
| Race, n (%) | | |
| Asian | 480 (0.5%) | 155 (0.5%) |
| Black | 13,327 (13.3%) | 3,169 (10.9%) |
| White | 85,486 (85.3%) | 25,330 (87.4%) |
| Other | 957 (1.0%) | 319 (1.1%) |
| Unknown | 134,714 | 42,670 |
| Insurance type, n (%) | | |
| Commercial | 120,955 (60.3%) | 36,577 (59.2%) |
| Medicaid | 10,634 (5.3%) | 3,013 (4.9%) |
| Medicare | 31,789 (15.8%) | 9,745 (15.8%) |
| More than one | 35,643 (17.8%) | 11,919 (19.3%) |
| Other | 1,641 (0.8%) | 502 (0.8%) |
| Unknown | 34,302 | 9,887 |

Figure 1. Symptoms during the 12-month observation period by sex

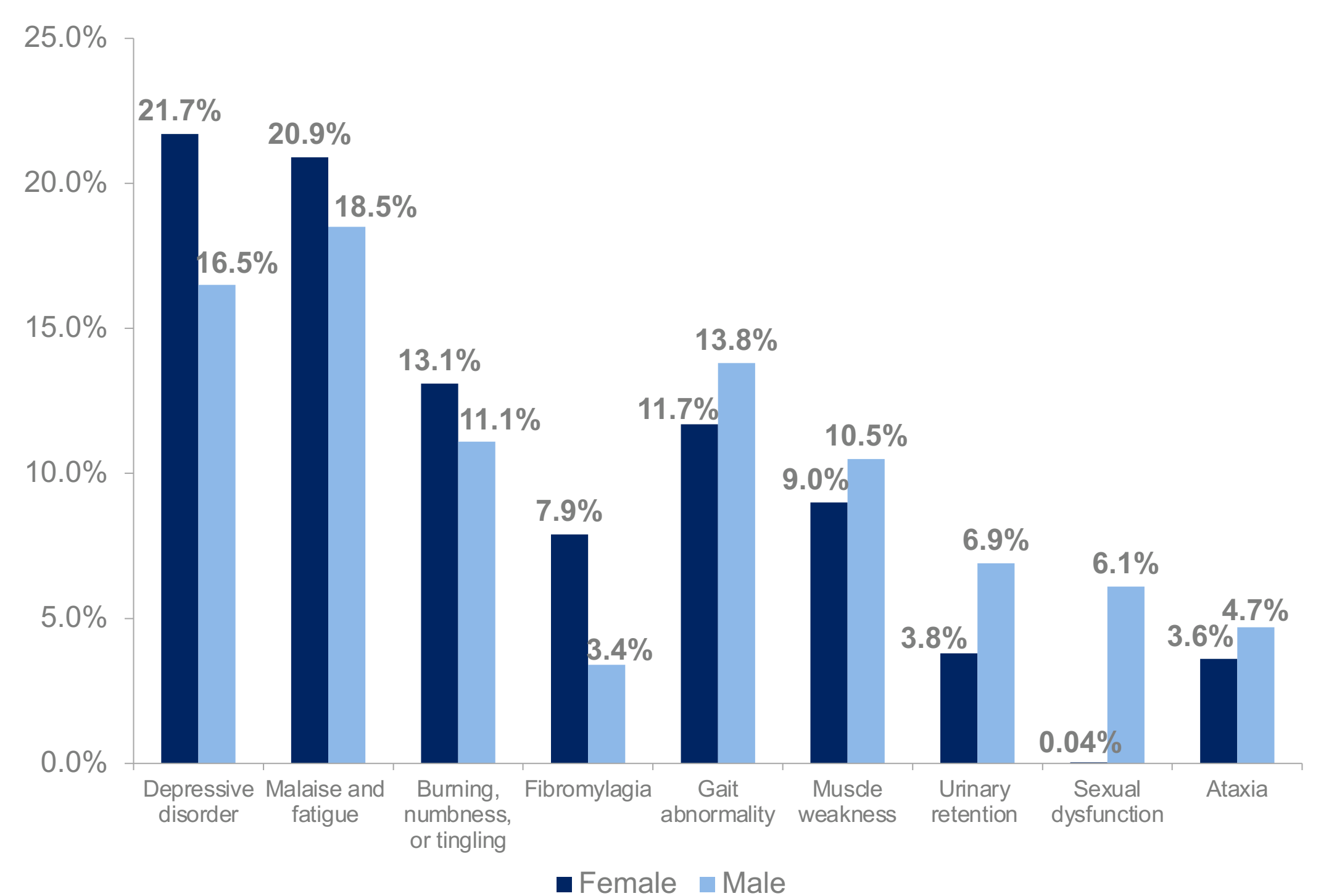


Figure 2. Healthcare resource utilization during the 12-month observation period by sex

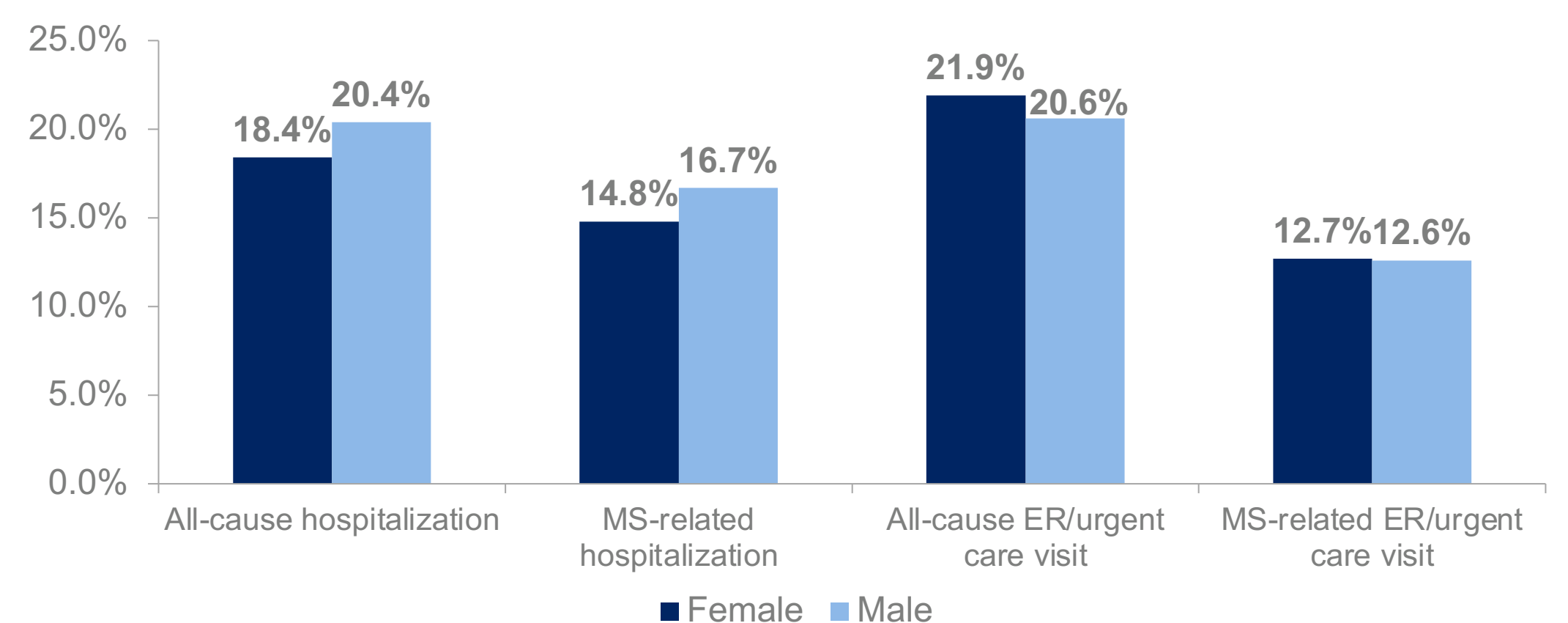


Figure 3. Treatment use during the 12-month observation period by sex

