**Economic burden of fatigue or morning stiffness among patients with rheumatoid arthritis: a retrospective analysis from real world data**

**Supplemental online material**

The following appendices provide additional information on this study. **Appendix A** illustrates the selection of study population. Patients meeting the inclusion criteria were divided into cases and controls. Case patients had incident RA with claims for fatigue or morning stiffness after, but not within 12 months before, the RA index date (n = 8,169). Control patients had incident RA with no claims for fatigue or morning stiffness (n = 17,156). Case patients were divided into cohorts with fatigue only (n = 6,465), morning stiffness only (n = 994), or both fatigue and morning stiffness (n = 710). HIV, human immunodeficiency virus; RA = rheumatoid arthritis. **Appendix B** provides the baseline characteristics for the propensity-score matched cohorts.

Appendix A. Selection of study population



Appendix B. Baseline characteristics for propensity-score matched cohorts

| **Variable** | **FatigueCohort****N=6,404** | **No Fatigue or Morning Stiffness Cohort****N=12,390** | **Standardized Difference** | **Morning StiffnessCohort****N=986** | **No Fatigue or Morning Stiffness Cohort****N=3,939** | **Standardized Difference** | **Fatigue and Morning Stiffness Cohort****N=708** | **No Fatigue or Morning Stiffness Cohort****N=2,830** | **Standardized Difference** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Duration of follow-up (months), mean ± SD | 56.2 ± 42.0 | 45.3 ± 36.0 | 0.278 | 54.3 ± 39.8 | 45.0 ± 35.7 | 0.248 | 71.3 ± 46.9 | 48.1 ± 38.6 | 0.54 |
| **Demographicsa** |  |
| Age (yr), mean ± SD | 49.7 ± 15.9 | 49.5 ± 15.1 | 0.011 | 49.1 ± 14.2 | 49.1 ± 15.0 | 0 | 50.1 ± 14.5 | 49.4 ± 14.9 | 0.043 |
| Age group (yr), n (%) |  |  |  |  |  |  |  |  |  |
| 18-34 | 1,101 (17.2) | 2,020 (16.3) | 0.024 | 166 (16.9) | 677 (17.2) | 0.009 | 97 (13.7) | 469 (16.6) | 0.081 |
| 35-44 | 1,408 (22.0) | 2,484 (20.1) | 0.047 | 193 (19.6) | 793 (20.1) | 0.014 | 145 (20.5) | 553 (19.6) | 0.023 |
| 45-54 | 1,661 (26.0) | 3,336 (27.0) | 0.023 | 286 (29.0) | 1,069 (27.2) | 0.042 | 225 (31.8) | 780 (27.6) | 0.092 |
| 55-64 | 1,110 (17.4) | 2,656 (21.5) | 0.104 | 189 (19.2) | 840 (21.3) | 0.054 | 114 (16.1) | 587 (20.8) | 0.121 |
| 65+ | 1,111 (17.4) | 1,862 (15.1) | 0.063 | 151 (15.3) | 557 (14.2) | 0.033 | 126 (17.8) | 434 (15.4) | 0.066 |
| Female, n (%) | 3,984 (62.2) | 7,092 (57.2) | 0.101 | 531 (53.9) | 2,145 (54.5) | 0.012 | 420 (59.3) | 1,591 (56.2) | 0.063 |
| Region, n (%) |  |  |  |  |  |  |  |  |  |
| North-central | 1,704 (26.6) | 3,332 (26.9) | 0.006 | 304 (30.8) | 1,062 (27.0) | 0.085 | 246 (34.7) | 829 (29.3) | 0.117 |
| Northeast | 1,042 (16.3) | 2,118 (17.1) | 0.022 | 126 (12.8) | 596 (14.4) | 0.049 | 72 (10.2) | 363 (12.8) | 0.083 |
| South | 2,566 (40.1) | 4,386 (35.4) | 0.096 | 334 (33.9) | 1,384 (35.1) | 0.027 | 269 (38.0) | 1,077 (38.1) | 0.001 |
| West | 1,016 (15.9) | 2,394 (19.3) | 0.091 | 216 (21.9) | 905 (23.0) | 0.026 | 110 (15.5) | 532 (18.8) | 0.087 |
| Unknown | 76 (1.2) | 160 (1.3) | 0.009 | 6 (0.6) | 19 (0.5) | 0.017 | 11 (1.6) | 29 (1.0) | 0.047 |
| **Clinical Characteristicsb** |  |
| CCI, mean ± SD | 0.07 ± 0.34 | 0.06 ± 0.31 | 0.031 | 0.04 ± 0.28 | 0.04 ± 0.25 | 0.004 | 0.07 ± 0.32 | 0.07 ± 0.35 | 0.003 |
| Number of psychiatric comorbidities, mean ± SD | 0.02 ±0.13 | 0.02 ± 0.13 | 0 | 0.02 ± 0.14 | 0.02 ± 0.13 | 0.015 | 0.02 ± 0.17 | 0.02 ± 0.13 | 0.047 |
| CIRAS score, mean ± SD | 4.66 ± 1.46 | 4.61 ± 1.38 | 0.04 | 4.77 ± 1.39 | 4.63 ± 1.34 | 0.106 | 4.66 ± 1.39 | 4.61 ± 1.35 | 0.031 |
| **Resource Utilization** |  |
| ED visits, mean ± SD | 0.35 ± 1.79 | 0.33 ± 1.68 | 0.009 | 0.38 ± 1.63 | 0.35 ± 0.19 | 0.019 | 0.25 ± 1.01 | 0.29 ± 1.3 | 0.035 |
| Office visits, mean ± SD | 2.05 ± 5.27 | 1.78 ± 4.73 | 0.053 | 2.31 ± 6.29 | 1.68 ± 4.39 | 0.117 | 2.5 ± 5.9 | 1.8 ± 4.6 | 0.127 |
| Hospitalizations, mean ± SD | 0.05 ± 0.24 | 0.04 ± 0.20 | 0.036 | 0.05 ± 0.23 | 0.03 ± 0.21 | 0.069 | 0.05 ± 0.23 | 0.04 ± 0.24 | 0.013 |
| Prior drug use, n (%) |  |  |  |  |  |  |  |  |  |
| DMARDs, n (%) | 279 (4.4) | 670 (5.4) | 0.049 | 47 (4.8) | 205 (5.2) | 0.02 | 31 (4.4) | 150 (5.3) | 0.043 |
| Steroids, n (%) | 777 (12.1) | 1,507 (12.2) | 0.001 | 136 (13.8) | 465 (11.8) | 0.06 | 123 (17.4) | 332 (11.7) | 0.161 |
| NSAIDs, n (%) | 131 (2.0) | 278 (2.2) | 0.014 | 35 (3.6) | 80 (2.0) | 0.092 | 23 (3.2) | 63 (2.2) | 0.063 |

aAssessed on RA index date (T0).

bAssessed during the 12 months before the RA index date (T0).

Covariates assessed after propensity score matching included age, gender, geographic region, health plan type, year of RA diagnosis, CCI, number of comorbid psychiatric conditions (generalized anxiety disorder, posttraumatic stress disorders, dementia, substance abuse disorder, and personality disorder), medication use (including steroids, analgesics, NSAIDs, and conventional synthetic and biologic DMARDs) the claims-based index for RA severity (CIRAS), and HCRU (hospital admissions and length of hospital stay, and ED, outpatient, and rehabilitation visits).

CCI, Charlson Comorbidity Index; CIRAS, claims-based Index for RA severity; DMARD, disease-modifying antirheumatic drugs; ED, emergency department; NSAIDs, nonsteroidal anti-inflammatory drugs; RA, rheumatoid arthritis; SD, standard deviation.