Healthcare resource utilization associated with polymyalgia rheumatica in the United States

Rajeshwari S. Punekar[1], Patrick R. LaFontaine[2], John H. Stone[3]

[1]Sanofi, Cambridge, MA, USA; [2]Sanofi, Bridgewater, NJ, USA; [3]Harvard Medical School, Boston, MA, USA

BACKGROUND

- Polymyalgia rheumatica (PMR) is a chronic, immune-mediated disorder,[1] which is most prevalent in patients aged over 50 years and the second most common inflammatory rheumatic disease in the elderly following rheumatoid arthritis (RA)[2]
- PMR presents as symmetrical pain and stiffness in and around the shoulders, neck and hip girdle;[3] symptoms cause a significant impact on patients' health, functioning and well-being[4]
- Current treatment options are limited, particularly in patients with insufficient response to glucocorticoids or recurrent disease flares;[5,6] additional limitations include the frequent adverse events associated with glucocorticoids[7,8]
- Information on the healthcare resource burden associated with PMR is limited to the use of physician resources in a specific US geography[9]

OBJECTIVE

- This study compared the healthcare resource utilization (HCRU) of patients with PMR against a matched, general population cohort

METHODS

Study design

- Data were obtained from Optum's de-identified Clinformatics® Data Mart Database between January 1, 2006 and June 30, 2018 (study period)
- Patients with ≥1 inpatient or ≥2 outpatient claims (≥30 days apart) with PMR-related diagnosis codes between January 1, 2007 and June 30, 2017 (patient identification period) were included in the PMR cohort; the service date of the patient's first PMR medical claim was set as their index date (Figure 1)
- Patients with ≥1 medical claim for RA or giant cell arteritis (GCA) diagnosis codes during the study period were excluded
- Patients without any medical claims for RA, GCA, or PMR during the study period were included in the general population cohort; the index date was set at 12 months from the start of continuous health plan enrollment
- Patients in both cohorts were required to be aged ≥50 years (on the index date) with ≥12 months continuous health plan enrollment before and after the index date

Study outcomes

- Patient demographic and clinical characteristics assessed during the baseline period included:
  - age on the index date, gender
  - health plan type
  - geographic region
  - Elixhauser Comorbidity Index (ECI) scores
  - chronic medical conditions with corticosteroid use similar to PMR
- HCRU assessed during the baseline period and follow-up period included:
  - inpatient hospitalization
  - emergency room visits
  - outpatient visits (including physician office visits, rheumatologist office visits, rehabilitation visits), other procedures conducted in outpatient setting (lab tests, diagnostic procedures, etc.)
  - pharmacy prescriptions

Analysis

- The PMR and general population cohorts were matched 1:1 on age, gender, region, health plan type, ECI score, chronic medical conditions with corticosteroid use similar to PMR, and baseline HCRU using propensity scores
- Descriptive statistics included mean, standard deviation (SD), and median values for continuous variables and frequency (n and %) for categorical variables
- Continuous variables were compared between the PMR cohort and matched general population cohort using independent *t*-test or Wilcoxon Sum Rank test depending on the distribution of the outcome
- Categorical variables were compared between the PMR cohort and the matched general population cohort using Chi-squared test or Fisher's exact test

RESULTS

- Among 16,865 patients in each matched cohort, the majority were female (64.6%) with mean (SD) age 74.4 (8.4) years and mean (SD) ECI score 2.8 (2.4) (Table 1)
- During 12 months baseline period, around 90% of both cohorts had ≥1 prescriptions, ~70% had ≥1 outpatient visits, ~30% had ≥1 emergency room visits, and ~13% had ≥1 inpatient hospitalization
- Around ~40% of the sample had acquired hyperthyroidism and fibromyalgia and ~20% of the sample had asthma during the baseline period

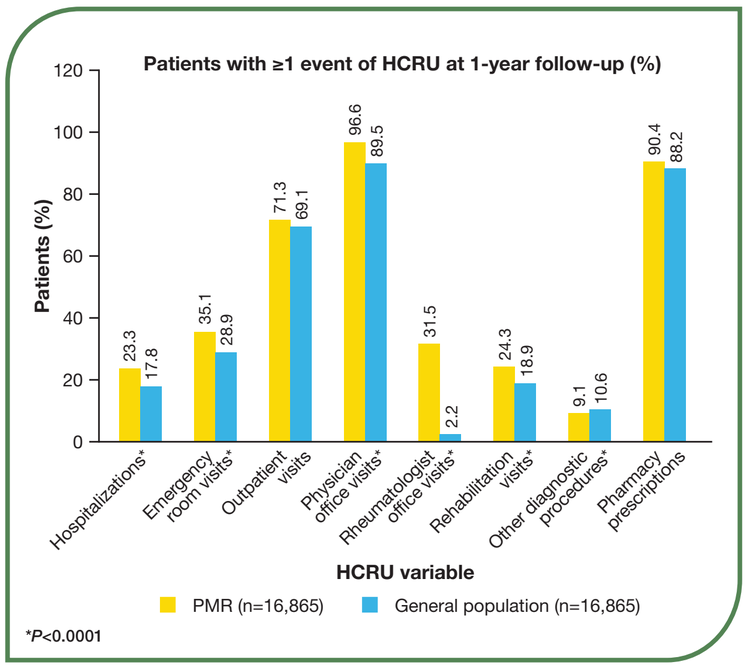
Table 1. Matched baseline characteristics

Demographic variable	PMR (n=16,865)	General population (n=16,865)
Age, mean (SD)	74.4 (8.4)	74.5 (8.3)
Median	76	76
Gender, n (%)		
Female	10,892 (64.6)	10,929 (64.8)
Male	5973 (35.4)	5936 (35.2)
Region, n (%)		
North Central	5116 (30.3)	6570 (39.0)
Northeast	2038 (12.1)	1727 (10.2)
South	3970 (23.5)	5260 (31.2)
West	5703 (33.8)	3260 (19.3)
Unknown	38 (0.2)	48 (0.3)
Health plan type, n (%)		
Exclusive provider organization	233 (1.4)	220 (1.3)
Health maintenance organization	9461 (56.1)	9539 (56.6)
Integrated delivery network	766 (4.5)	775 (4.6)
Point-of-service	1588 (9.4)	1574 (9.3)
Preferred provider organization	1889 (11.2)	1883 (11.2)
Other	2928 (17.4)	2874 (17.0)
ECI scores		
Mean (SD)	2.8 (2.4)	2.8 (2.3)
Median	2.0	2.0
Conditions with CS use similar to PMR during the entire study period, n (%)		
Asthma	3321 (19.7)	3239 (19.2)
Ankylosing spondylitis	38 (0.2)	39 (0.2)
Crohn's disease	90 (0.5)	86 (0.5)
Juvenile idiopathic arthritis	0 (0)	0 (0)
Psoriatic arthritis	600 (3.6)	597 (3.5)
Ulcerative colitis	207 (1.2)	196 (1.2)
Chronic lymphocytic leukemia	93 (0.6)	131 (0.8)
Non-Hodgkin's lymphoma	213 (1.3)	265 (1.6)
Diffuse diseases of connective tissue	438 (2.6)	443 (2.6)
Myopathies	2083 (12.4)	1991 (11.8)
Acquired hypothyroidism	6700 (39.7)	6209 (36.8)
Fibromyalgia	7267 (43.1)	7244 (43.0)
Baseline HCRU, n (%) who had ≥1 event		
Hospitalizations	2254 (13.4)	2215 (13.1)
Emergency room visits	4862 (28.8)	4801 (28.5)
Outpatient visits	11,382 (67.5)	11,513 (68.3)
Pharmacy prescriptions	14,936 (88.6)	14,996 (88.9)

*P<0.0001

- During the 1-year follow-up period, the proportions of patients with ≥1 hospitalizations (23.3% vs 17.8%), emergency room visits (35.1% vs 28.9%), physician office visits (96.6% vs 89.5%), rheumatologist office visits (31.5% vs 2.2%), rehabilitation visits (24.3% vs 18.9%), and other diagnostic procedures (10.6% vs 9.1%) were significantly higher (P<0.0001) among PMR patients than the general population cohort, respectively (Figure 2)

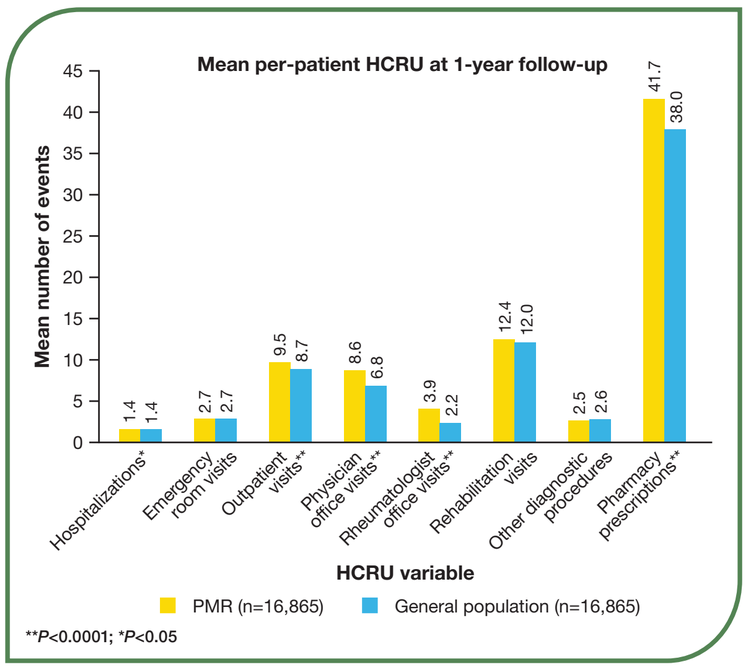
Figure 2. Proportion of patients with at least one event of HCRU at 1-year follow-up



*P<0.0001

- During 1-year follow-up period, mean (SD) outpatient visits (9.5 [8.2] vs 8.7 [8.0]), physician office visits (8.6 [4.3] vs 6.8 [4.2]), rheumatologist office visits (3.9 [2.1] vs 2.2 [1.4]), and pharmacy prescriptions (41.7 [32.3] vs 38.0 [32.6]) per patient were significantly higher (P<0.0001) among PMR patients than the general population cohort (Figure 3)

Figure 3. Mean per-patient HCRU events at 1-year follow-up



**P<0.0001; *P<0.05

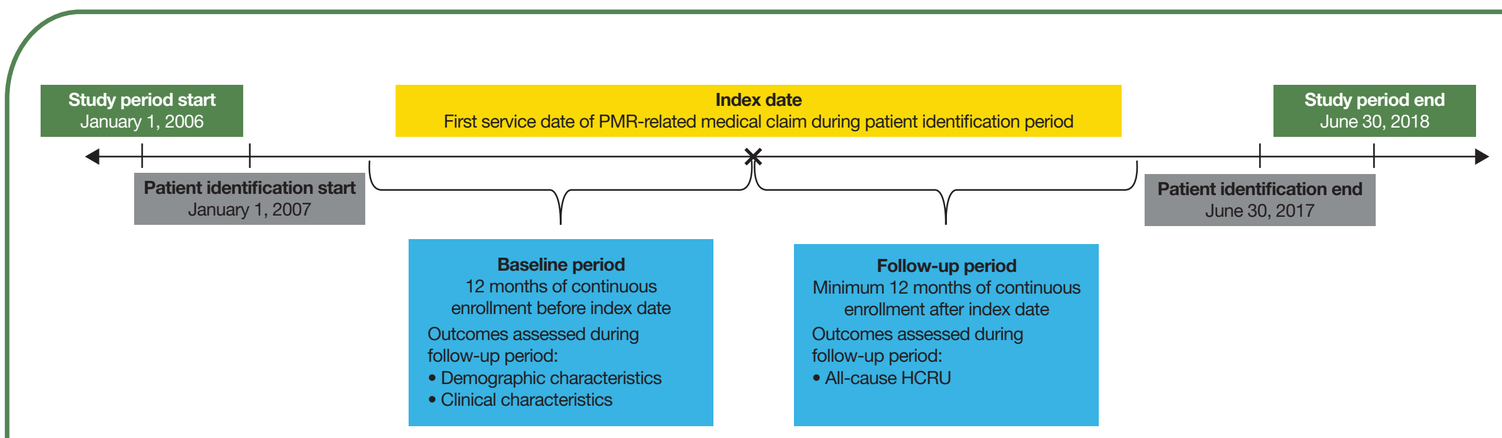
Study limitations

- Claims data are primarily collected for billing purposes rather than research, therefore, prone to be incomplete or have inaccurate coding of diagnoses
- Commercially insured individuals were analyzed, thus our results may not be generalizable to other patient populations
- As with all real-world data sources, there may be missing data that impact the study outcomes

CONCLUSIONS

- The higher overall HCRU among patients with PMR versus the matched, highly comorbid general population cohort suggests that PMR is a disease of high healthcare resource burden
- Further research is required to elucidate the full burden of PMR, including healthcare expenditure data, impact on health-related quality of life, the burden beyond 1 year of follow-up, and PMR subgroups that most significantly impact HCRU

Figure 1. Study schema



References

1. Gonzalez-Gay MA et al. *Lancet.* 2017;390:1700–1712.
2. Lawrence RC et al. *Arthritis Rheum.* 2008;58:26–35.
3. Mackie SL. *Clin Med (Lond).* 2013;13:398–400.
4. Camellino D et al. *Reumatismo.* 2018;70:59–66.
5. Salvarani C et al. *Arthritis Rheum.* 2005;53:33–38.
6. Helliwell T et al. *J Rheumatol.* 2016;43:182–186.
7. Dejaco C et al. *Ann Rheum Dis.* 2015;74:1799–1807.
8. Mazzantini M et al. *J Rheumatol.* 2012;39:55–557.
9. Kremers HM et al. *Arthritis Rheum.* 2005;53:395–403.

Acknowledgements

The study was funded by Sanofi and Regeneron Pharmaceuticals, Inc. Medical writing and editorial support, respectively, were provided by Gauri Saal, MA Economics, and Sinead Stewart, Prime, Knutsford, UK, and funded by Sanofi.

Disclosures

RP is an employee and shareholder of Sanofi. PL is an employee of Sanofi. JS is a consultant of Sanofi.