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Outcomes of COVID-19 Infection in Patients with Primary Systemic Vasculitis and Polymyalgia Rheumatica: Results from the COVID-19 Global Rheumatology Alliance Physician Registry

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SESSION INFORMATION

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Session Title: Abstracts: Vasculitis – ANCA-Associated (0952–0955)

Session Time: 9:00AM-9:15AM

Background/Purpose: Patients with primary systemic vasculitis (PSV) and polymyalgia rheumatica (PMR) may be at high risk for poor COVID-19 outcomes due to the treatments used, the potential organ damage caused by PSV, and demographic factors such as older age that are associated with these conditions. We investigated factors associated with COVID-19 outcomes in patients with PSV and PMR in a large multinational registry.

Methods: We analyzed PSV and PMR cases from the COVID-19 Global Rheumatology Alliance registries (12/Mar/2020-12/Apr/2021). PSV diagnoses included ANCA vasculitis (AAV), giant cell arteritis (GCA), Behçet's syndrome, and other vasculitides. The ordinal COVID-19 severity outcome was: 1) no hospitalization, 2) hospitalization without oxygen, 3) hospitalization with oxygen/ventilation, or 4) death. Relevant covariates included age, sex, race, season, number of comorbidities, BMI, smoking status, disease activity, immunosuppressive therapies (conventional synthetic and biologic/targeted synthetic DMARDs), glucocorticoid (GC) (daily dose prednisolone-equivalent), and region. Multivariable ordinal logistic regressions were used to estimate odds ratios (ORs) for being one level higher on the ordinal outcome. Analyses were also stratified by disease (GCA, AAV, or PMR).

Results: Of 1,202 included patients, 61.0% were female; mean age was 63.8 years. Diagnoses were PMR (31.1%), AAV (29.3%), GCA (15.2%), Behçet's syndrome (9.4%), and other vasculitis (15.0%). Overall, 508 (49.8%) patients were hospitalized, and 155 (15.2%) patients died (Table 1). Older age (OR 1.46, 95% CI 1.33-1.60), male sex (OR 1.46, 95% CI 1.12-1.91), GC dose \geq 10 mg/day (OR 2.14, 95% CI 1.48-3.09), moderate/severe or high disease activity (OR 2.32, 95% CI 1.60-3.36) and number of comorbidities (OR 1.38, 95% CI 1.22-1.57) were associated with worse outcome (Table 2). In the disease-specific stratified analysis, 20.3% and 22.2% of patients with GCA and AAV, respectively, died. Risk factors for poorer outcomes were: for GCA patients, older age (OR 1.79, 95% CI 1.21-2.65) and obesity (OR 3.04, 95% CI 1.17-3.04); for AAV patients, older age (OR 1.45, 95% CI 1.18-1.79), rituximab

(OR 2.50, 95% CI 1.33-4.68) or cyclophosphamide use (OR 6.43, 95% CI 1.48-28.01), and moderate/severe or high disease activity (OR 2.71, 95% CI 1.21-6.07); and for polymyalgia rheumatica, older age (OR 2.69, 95% CI 1.99-3.63) and higher comorbidity burden (OR 1.31, 95% CI 1.03-1.67). Overall, severe outcomes were less likely if COVID-19 infection developed between October 1, 2020, and April 12, 2021 (OR 0.47, 95% CI 0.35-0.63). This was also observed in the disease-specific analysis.

Conclusion: Patients with GCA or AAV who had COVID-19 infection had higher rates of severe outcomes compared to PMR and other vasculitis, even despite similar ages of the GCA and PMR groups. Risk factors identified for different PSV subtypes may inform mitigation strategies for these patients.

Figure 1. Global distribution of primary systemic vasculitis and polymyalgia rheumatica patients with COVID-19 infection in the COVID-19 Global Rheumatology Alliance Physician Registry

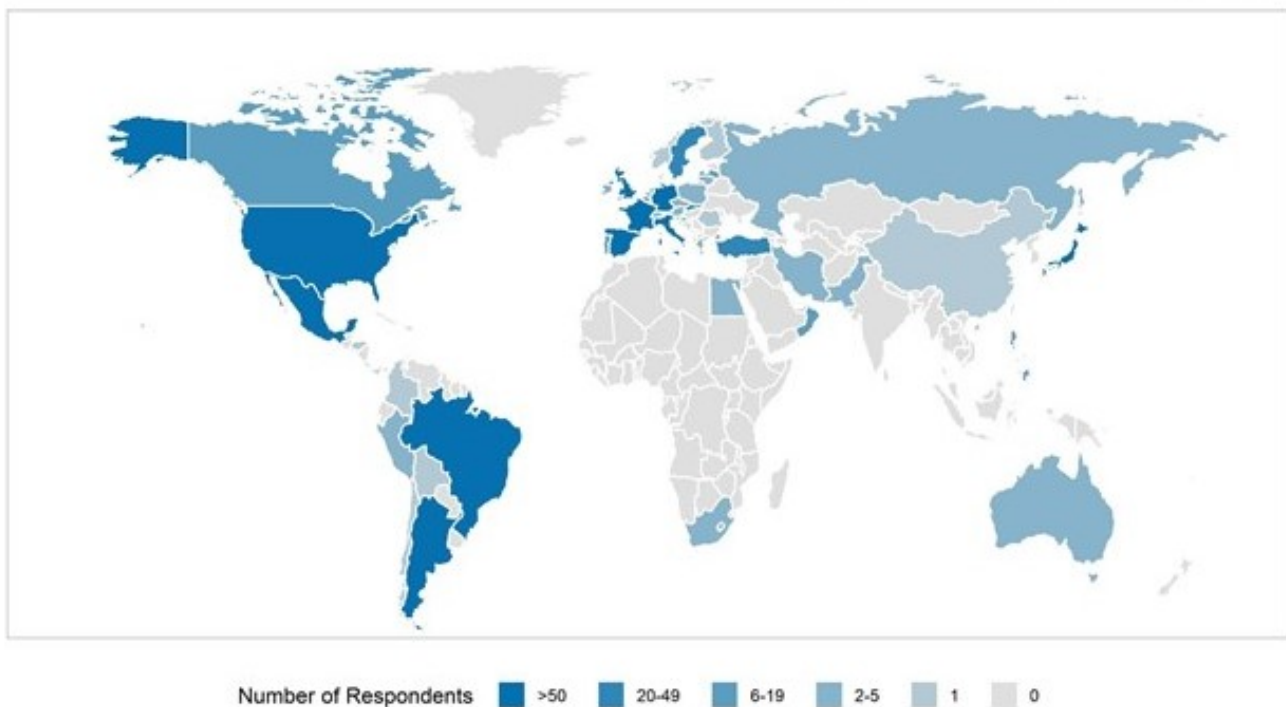


Figure 1.



Table 1. Frequencies and proportions of outcomes in the ordinal COVID-19 severity scale according to diagnosis*

COVID-19 Severity scale	Overall (N = 1020)	GCA (N = 158)	AAV (N = 293)	PMR (N = 323)	Behcets (N = 98)	Other vasculitis (N = 148)
Not Hospitalized	512 (50.2)	69 (43.7)	110 (37.5)	187 (57.9)	84 (85.7)	77 (52.0)
Hospitalization with No Oxygenation	114 (11.2)	19 (12.0)	30 (10.2)	30 (9.3)	11 (11.2)	20 (13.5)
Hospitalization with Any Ventilation or Oxygenation	239 (23.4)	38 (24.1)	88 (30.0)	71 (22.0)	1 (1.0)	30 (20.3)
Death	155 (15.2)	32 (20.3)	65 (22.2)	35 (10.8)	2 (2.0)	21 (14.2)

* Excluding 182 cases with missing outcome data
 COVID-19, Coronavirus Disease 2019; AAV, ANCA-associated vasculitis; GCA, giant cell arteritis; PMR, polymyalgia rheumatica.

Table 1.



Table 2. Multivariable[†] logistic regression analysis of factors associated with the ordinal COVID-19 severity outcomes for patients with primary systemic vasculitis or polymyalgia rheumatica

Factors	OR (95% CI)	p-value
Age (per decade)	1.46 (1.33, 1.60)	<0.01**
Sex		
Female	REF	
Male	1.46 (1.12, 1.91)	<0.01**
Season		
Prior to June 15, 2020	REF	
June 16-Sept 30, 2020	1.07 (0.71, 1.61)	0.76
Oct 1,2020- April 12,2021	0.47 (0.35, 0.63)	<0.01**
Number of Comorbidities	1.38 (1.22, 1.57)	<0.01**
Smoking	0.95 (0.70, 1.28)	0.73
Obesity	1.26 (0.91, 1.75)	0.16
Glucocorticoid (prednisone equivalent)		
No glucocorticoid use	REF	
1-5 mg/day	1.14 (0.81, 1.59)	0.45
6-9 mg/day	1.30 (0.80, 2.11)	0.29
≥ 10 mg/day	2.14 (1.48, 3.09)	<0.01**
Disease Activity		
Remission/Minimal or low	REF	
Moderate/Severe or high	2.32 (1.60, 3.36)	<0.01**

[†]Adjusted for sex, age, region, medication category, season, number of comorbidities, disease activity, and random effects of region
* p < 0.05
** p < 0.005
The effect size is the odds of being one level higher on the ordinal scale than the reference group.
COVID-19, Coronavirus Disease 2019

Table 2.

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