

SUPPLEMENTAL MATERIALS

Supplemental Table 1. Rheumatic disease terms used to identify patients with systemic rheumatic disease and their associated ICD-9 and ICD-10 codes

Category	Rheumatic Disease (ICD codes)
Inflammatory arthritis	<ul style="list-style-type: none"> • Rheumatoid arthritis (M05%, M06%, 714%) • Inflammatory arthritis or inflammatory polyarthropathy (M06.4, 714.89, 714.9) • Juvenile idiopathic arthritis (M08.20, 714.3) • Psoriatic arthritis or arthropathic psoriasis (L40.50, 696.0) • Ankylosing spondylitis (M45.9, 720.0)
Vasculitis	<ul style="list-style-type: none"> • ANCA-associated vasculitis: granulomatosis with polyangiitis, eosinophilic granulomatosis with polyangiitis, microscopic polyangiitis (M31.3, M31.7, M30.0, 446.0, 446.4, 446.7, 447.6) • Kawasaki disease (M30.3, 446.1) • Takayasu arteritis (M31.4, 446.7) • Polyarteritis nodosa (M30.0, 446.0) • Giant cell arteritis/polymyalgia rheumatica (M31.6, 446.5, M35.3, 725%)* • Behçet disease (M35.2, 136.1) • Unspecified arteritis (I77.6, 447.6)
Other Systemic Autoimmune Diseases	<ul style="list-style-type: none"> • Systemic lupus erythematosus (M32%, 710.0) • Sjogren's syndrome (M35.0, 710.2) • Idiopathic inflammatory myositis: dermatomyositis, polymyositis, statin-associated autoimmune myositis, unspecified myositis (G72.49, G72.41, M33, 710.3, 710.4) • Systemic sclerosis (M34.0, M34.1, M34.8%, M34.9, 710.1) • Mixed connective tissue disease (M35.1, 710.9) • Antiphospholipid syndrome (D68.61, 239.81) • Sarcoidosis (D86.0, D86.9, 135%) • IgG4-related disease (M35)

ICD = international classification of disease 9th or 10th revision codes. % indicates a wild character to capture all instances of a given code.

*Patients with remote polymyalgia rheumatica (last prednisone use \geq 5 years prior) were excluded.

Supplemental Table 2. Characteristics of rheumatic disease patients with COVID-19 infection requiring and not requiring hospitalization.

Characteristic	Hospitalized patients (N=23)	Non-hospitalized patients (N=29)	p-value
Age	67.0 ± 14.9	58.9 ± 14.4	0.05
Female	14 (61%)	22 (76%)	0.24
Race			0.17
White	10 (43%)	20 (69%)	
Black or African American	7 (30%)	4 (14%)	
Asian	0	1 (3%)	
Other*	6 (26%)	4 (14%)	
Hispanic or Latinx ethnicity	6 (26%)	4 (14%)	0.26
Body mass index (mean, SD, kg/m ²)	29.9 ± 6.8	29.7 ± 6.3	0.88
Smoking status			0.44
Never	13 (57%)	16 (55%)	
Former	10 (43%)	10 (34%)	
Current	0	2 (7%)	
Comorbidities	2.0 (1.0, 2.0)	1.0 (0.0, 1.0)	0.03
Hypertension	17 (74%)	17 (59%)	0.25
Diabetes	9 (39%)	4 (14%)	0.04
Coronary artery disease	7 (30%)	5 (17%)	0.26
Heart failure	3 (13%)	1 (3%)	0.31
Pulmonary disease [†]	9 (39%)	12 (41%)	0.87
Rheumatological diagnosis			
Rheumatoid arthritis	5 (22%)	14 (48%)	0.05
Systemic lupus erythematosus	6 (26%)	4 (14%)	0.26
Polymyalgia rheumatica	3 (13%)	4 (14%)	0.94
Seronegative spondyloarthropathy	4 (17%)	3 (10%)	0.46
Myositis	3 (13%)	0	0.05
Giant cell arteritis	0	1 (3%)	0.37
Sarcoidosis	1 (4%)	0	0.26
Small vessel vasculitis	1 (4%)	1 (3%)	0.87
Other [‡]	0	2 (7%)	0.20
Rheumatic disease status			0.66
Remission	9 (39%)	10 (34%)	
Mild	9 (39%)	14 (48%)	
Moderate	5 (22%)	4 (14%)	
Severe	0	1 (3%)	
Baseline rheumatologic medications			
Hydroxychloroquine	5 (22%)	4 (14%)	0.45
Hydroxychloroquine monotherapy	2 (9%)	3 (10%)	0.84
Any immunosuppressive medication [¶]	17 (74%)	22 (76%)	0.87
Biologic DMARD	6 (26%)	10 (34%)	0.42
Targeted synthetic DMARD	1 (4%)	2 (7%)	0.76
Hydroxychloroquine	5 (22%)	4 (14%)	0.45
Conventional synthetic DMARD	6 (26%)	11 (38%)	0.26

Data are represented by mean \pm standard deviation or number (percentage). DMARD = disease-modifying anti-rheumatic drug.

* Other race includes American Indian or Alaska Native, Native Hawaiian or other Pacific Islander, and Not Reported.

† Pulmonary disease included interstitial lung disease, asthma, chronic obstructive pulmonary disease, or obstructive sleep apnea.

‡ Other category included 1 patient with Kikuchi's disease and 1 patient with juvenile idiopathic arthritis.

¶ Hydroxychloroquine was not included as an immunosuppressive medication. Glucocorticoids, biologic DMARDs, conventional synthetic DMARDs, and targeted synthetic DMARDs were included.

Supplemental Table 3. Characteristics of rheumatic disease patients with COVID-19 infection requiring hospitalization vs. non-rheumatic disease comparators with COVID-19 infection requiring hospitalization.

Characteristic	Hospitalized rheumatic disease patients (N=23)	Hospitalized non-rheumatic disease patients (N=39)	p- value
Age	67.0 ± 14.9	70.0 ± 13.3	0.81
Female	14 (61%)	23 (59%)	0.88
Race			0.14
White	10 (43%)	12 (31%)	
Black or African American	7 (30%)	6 (15%)	
Asian	0	3 (8%)	
Other*	6 (26%)	18 (46%)	
Hispanic or Latinx ethnicity	6 (26%)	16 (41%)	0.24
Body mass index (mean, SD, kg/m ²)	29.9 ± 6.8	29.9 ± 7.2	0.88
Smoking status			0.27
Never	13 (57%)	25 (64%)	
Former	10 (43%)	10 (26%)	
Current	0	3 (8%)	
Comorbidities			
Hypertension	17 (74%)	29 (74%)	0.97
Diabetes	9 (39%)	15 (38%)	0.96
Coronary artery disease	7 (30%)	5 (13%)	0.09
Heart failure	3 (13%)	8 (21%)	0.46
Pulmonary disease†	9 (39%)	14 (36%)	0.80

*Other race includes American Indian or Alaska Native, Native Hawaiian or other Pacific Islander, and Not Reported.

†Pulmonary disease included interstitial lung disease, asthma, chronic obstructive pulmonary disease, or obstructive sleep apnea.