

THE LANCET

Rheumatology

Supplementary appendix

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Appendix 1. Demographic and clinical characteristics of patients with RMD after two-dose SARS-CoV-2 mRNA vaccination, stratified by anti-SARS-CoV-2 RBD antibody-response after three- months.

	Overall¹ (n=809)	Negative (n=56)¹	Low-positive¹ (n=77)	High-positive (n=676)¹
Age, median (IQR)	49 (39,59)	50.5 (41.4, 58.8)	52.3 (40.0, 61.7)	48.0 (38.6, 58.7)
Female sex, no. (%)²	745 (92.0)	51 (91.1)	72 (93.5)	622 (92.3)
Non-white, no. (%)²	61 (7.5)	8 (14.3)	7 (9.3)	46 (6.9)
Diagnosis, no. (%)				
Inflammatory arthritis ³	355 (43.8)	14 (25.0)	31 (40.3)	310 (45.9)
Systemic lupus erythematosus	147 (18.2)	13 (23.2)	12 (15.6)	122 (18.0)
Sjögren's syndrome	39 (4.8)	3 (5.4)	2 (2.6)	34 (5.0)
Myositis	44 (5.4)	5 (8.9)	8 (10.4)	31 (4.6)
Vasculitis ⁴	16 (1.9)	4 (7.1)	3 (3.9)	9 (1.3)
Systemic sclerosis	8 (1)	2 (3.6)	0 (0.0)	6 (0.9)
Overlap connective tissue disease ⁵	188 (23.2)	12 (21.4)	20 (26.0)	156 (23.1)
Other ⁶	12 (1.5)	3 (5.4)	1 (1.3)	8 (1.2)
Vaccine, no. (%)				
Pfizer/BioNTech	436 (53.9)	34 (61)	50 (65)	352 (52.1)
Moderna	376 (46.4)	22 (39)	27 (35)	327 (47.9)
Days from D2 to 1mo testing, median (IQR)	29 (28,32)	29 (28,33)	29 (28, 32)	29 (28,32)
Days from D2 to 3mo testing, median (IQR)	91 (87,94)	91 (87, 94)	91 (87, 93)	91 (87, 94)
Therapy included in regimen, no. (%)⁷				
Conventional DMARD				
Azathioprine	58 (7.2)	6 (10.7)	6 (7.8)	46 (6.8)
Hydroxychloroquine	322 (39.8)	17 (30.4)	27 (35.1)	278 (41.1)
Leflunomide	33 (4.1)	2 (3.6)	3 (3.9)	28 (4.1)
Methotrexate	209 (25.8)	14 (25.0)	19 (24.7)	176 (26.0)
Mycophenolate ⁸	114 (14.1)	16 (28.5)	19 (24.7)	79 (11.6)
Sulfasalazine	35 (4.3)	2 (3.6)	2 (2.6)	31 (4.6)
Tacrolimus	11 (1.3)	0 (0.0)	5 (6.5)	6 (0.9)
Biologic				
Belimumab	83 (10.2)	3 (5.4)	8 (10.4)	72 (10.7)
Interleukin inhibitors				
Anakinra	2 (0.3)	0 (0.0)	0 (0.0)	2 (0.3)
IL-6 inhibitors ⁹	10 (1.2)	0 (0.0)	2 (2.6)	8 (1.2)
IL-17 inhibitors ¹⁰	19 (2.3)	0 (0.0)	1 (1.3)	18 (2.7)

Ustekinumab	14 (1·7)	0 (0·0)	0 (0·0)	14 (2·1)
JAK inhibitor ¹¹	50 (6·1)	1 (1·7)	1 (1·3)	48 (7·1)
Rituximab	52 (6·4)	33 (58·9)	11 (14·3)	8 (1·2)
TNF inhibitor ¹²	173 (21·4)	5 (8·9)	23 (29·9)	145 (21·4)
Immunomodulatory ¹³	43 (5·3)	2 (3·6)	14 (18·2)	27 (4·0)
Glucocorticoid ¹⁴	227 (28)	26 (46·4)	32 (41·6)	169 (25)

1 The percentages in these columns are shown as percent of each category in the overall column. Negative antibody response was defined per manufacturer data as Roche Elecsys anti-RBD pan Ig <0·8 units/mL. Low-positive antibody response was defined as anti-RBD pan Ig 0·8-50 units/mL. High-positive antibody response was defined as anti-RBD pan Ig >50 units/mL.

2 The denominators for these categories differ from the total N as 1 participant selected “prefer not to answer” for sex, 8 selected “prefer not to answer” for race, 2 did not respond to the vaccine manufacturer question, and 1 did not respond to the prior COVID-19 diagnosis question.

3 Rheumatoid arthritis, ankylosing spondylitis, psoriatic arthritis, reactive arthritis, or inflammatory bowel disease associated arthritis

4 Polyarteritis nodosa, Behcet's syndrome, polymyalgia rheumatica, temporal arteritis, eosinophilic granulomatosis polyangiitis, granulomatous polyangiitis, Henoch-Schonlein purpura, microscopic polyangiitis, or Takayasu arteritis

5 Denotes combination of two or more of inflammatory arthritis, systemic lupus erythematosus, Sjögren's syndrome, myositis, vasculitis and systemic sclerosis

6 Other denotes participants with Adult onset Still's disease, undifferentiated connective tissue disease, or sarcoidosis

7 Patients could select >1 medication, thus n>809

8 Mycophenolate includes mycophenolic acid and mycophenolate mofetil.

9 Interleukin (IL)-6 inhibitors include sarilumab and tocilizumab.

10 IL-17 inhibitors include ixekizumab and secukinumab.

11 Janus kinase (JAK) inhibitors include tofacitinib and upadacitinib.

12 TNF inhibitors include adalimumab, certolizumab, etanercept, golimumab, and infliximab.

13 Immunomodulatory includes intravenous immunoglobulin (IVIg) and subcutaneous Immunoglobulin (SCIg).

14 Glucocorticoid includes prednisone and prednisone equivalents.

Appendix 2. Clinical characteristics of 15 patients with de novo antibody response at three months following two-dose SARS-CoV-2 vaccination

Age	Sex	Diagnosis	Therapy	1 Month Titer	3 Month Titer
62	Female	Overlap connective tissue disease ¹	Azathioprine Belimumab Glucocorticoid ² Hydroxychloroquine	<0-40	1-30
37	Female	Myositis	Azathioprine Glucocorticoid ¹ Tacrolimus	<0-40	2-70
63	Female	Scleroderma, Vasculitis ³	Mycophenolate ⁴	<0-40	2-70
50	Female	Systemic lupus erythematosus	Glucocorticoid ² Hydroxychloroquine IVIg Mycophenolate ⁴ Rituximab	<0-40	6-00
40	Female	Systemic lupus erythematosus	Belimumab Hydroxychloroquine Glucocorticoid ² Mycophenolate ⁴	<0-40	6-40
70	Female	Myositis	Hydroxychloroquine IVIg Mycophenolate ⁴	<0-40	7-50
39	Female	Systemic lupus erythematosus	Hydroxychloroquine Mycophenolate ⁴ Glucocorticoid ²	0-76	7-70
34	Female	Myositis	Azathioprine IVIg	<0-40	10-10
37	Female	Vasculitis ³	Mycophenolate ⁴ Tacrolimus	<0-40	15-80
60	Female	Vasculitis ³	Mycophenolate ⁴	<0-40	60-30
30	Female	Overlap connective tissue disease ¹	Hydroxychloroquine Mycophenolate ⁴	<0-40	80-70
43	Female	Overlap connective tissue disease ¹	Glucocorticoid ² Mycophenolate ⁴ Tacrolimus	<0-40	146-00
48	Female	Systemic lupus erythematosus	Glucocorticoid ² Hydroxychloroquine, Mycophenolate ⁴ Tacrolimus	0-43	174-30
52	Female	Myositis	Hydroxychloroquine Mycophenolate ³ Glucocorticoid ²	<0-40	216-90
65	Female	Overlap connective tissue disease ¹	Mycophenolate ⁴	<0-40	249-00

1 Denotes combination of two or more of inflammatory arthritis, systemic lupus erythematosus, Sjögren's syndrome, myositis, vasculitis and systemic sclerosis

2 Glucocorticoid includes prednisone and prednisone equivalents.

3 Polyarteritis nodosa, Behcet's syndrome, polymyalgia rheumatica, temporal arteritis, eosinophilic granulomatosis polyangiitis, granulomatous polyangiitis, Henoch-Schonlein purpura, microscopic polyangiitis, or Takayasu arteritis

4 Mycophenolate includes mycophenolic acid and mycophenolate mofetil.