Trust,Thrombosis and Haemostasis, London, United Kingdom; [4]University Hospital of Copenhagen Rigshospitalet, Glostrup, DANBIO,The Danish Rheumatologic Biobank and Copenhagen Center for Arthritis Research (COPECARE), Center for Rheumatology and Spine Diseases, Centre of Head and Orthopedics, Copenhagen, Denmark; [5]Faculty of Health and Medical Sciences, University of Copenhagen, Department of Clinical Medicine, Copenhagen, Denmark

Background: During the COVID-19 pandemic, it remains a major concern whether patients with rheumatic musculoskeletal disease treated with conventional (cs) or biologic (b) disease modifying drugs (DMARDs) exhibit an adequate immune response to the currently available SARS-CoV2 vaccines. There remains an urgent need for more data on SARS-CoV-2 vaccine efficacy to inform healthcare providers on the efficiency of the applied vaccination, potential need of and period for booster and/ or re-vaccination.

Objectives: To assess and compare the efficacy of the SARS-CoV2 vaccines BNT162b2 vaccine (Pfizer/BioNTech) and mRNA-1273 vaccine (Moderna). (*The vaccines were administered as part of the Danish vaccine roll out and offered each with two doses and approximately four weeks apart*).

Patients' SARS-CoV2 IgG serum level was used as proxy to determine vaccination response.

Methods: We established the 'Detection of SARS-CoV2 antibodies in Danish Inflammatory Rheumatic Outpatients' study (DECODIR) as a longitudinal prospective cohort study. Patients with rheumatoid arthritis (RA), spondyloarthropathies (SpA) or psoriatic arthritis (PsA) receiving their outpatient treatment and monitored in the Danish DANBIO registry at the Danish Hospital for Rheumatic Diseases (DG), Sonderborg were included (April - June 2021).

Bloods, patient reported outcome measurements (PROMS), clinical data and treatment information (cs/bDMARD) were collected at baseline (prior to vaccination) and after six weeks and six months. SARS-CoV2 IgG levels in serum were assessed by ELISA (ThermoFischer), and manufacturer's cut-off (>=10 EliA U/mL) selected as definition of sufficient IgG response.

Associations between antibody response, age, gender, disease (RA/PsA/SpA), treatment with no or cs/bDMARDs and disease activity were tested using proportional odds regression and bootstrapped tests of medians. Results were reported using mean, median (IqR) and bootstrapped 95% confidence interval (CI) of the median.

Results: A total of 243 patients were included at baseline and after six weeks; at six months' follow-up data were available for 233 patients.

After six weeks, vaccination was followed by a significant increase in IgG levels (median of <0.7 EliA U/mL at baseline *versus* 36.5 EliA U/mL). Patients treated with a combination of both cDMARD and bDMARD had significantly lower IgG levels compared to patients without any DMARD treatment (8,2 EliA U/mL vs 19.5 EliA U/mL (p<0.001)). Patients treated with oral prednisolone (any dose) also showed significantly lower median IgG levels compared to patients without DMARD treatment (3,8 EliA U/mL vs 19.5 EliA U/mL (p<0.01)).

The actual measurements six months after baseline demonstrated a significant decrease of IgG levels for the whole study population (median of 16 EliA U/mL at six month vs 36.5 EliA U/mL at six weeks, p < 0.001) (Figure 1).

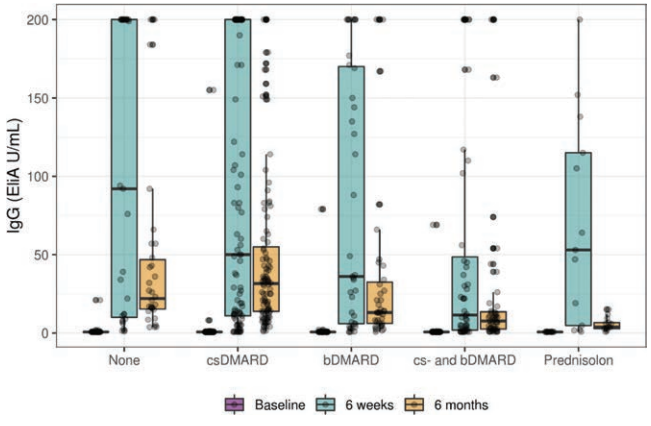

Figure 1. IgG-level stratified by treatment

Similar to week 6, lowest response rates were found in patients treated with prednisolone or combination of csDMARD and bDMARD. After 6 months, the proportional odds model revealed significantly lower median IgG antibody level in patients who received Pfizer compared to Moderna (median 15 EliA U/mL (95%CI: 13-18) vs 44.5 EliA U/mL (95%CI: 36-83) (p<0.001).

Conclusion: IgG levels decreased markedly six months after the initial double dose regimen. Patients treated with a combination of cs/bDMARD or oral prednisolone are at higher risk of inadequate vaccine response as measured by IgG level.

Our results support the decision for the need of a third booster vaccine in patients with inflammatory rheumatic diseases, especially in the case of cs/bDMARD combination treatment and prednisolone. The data may indicate a need for further revaccination in these patients.

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POS0200

POST-MRNA VACCINE FLARES IN AUTOIMMUNE INFLAMMATORY RHEUMATIC DISEASES: INTERIM RESULTS FROM THE CORONAVIRUS NATIONAL VACCINE REGISTRY FOR IMMUNE DISEASES SINGAPORE (CONVIN-SING)

M. Ma[1,2], A. Santosa[1,2], K. O. Kong[3], C. Xu[3], J. T. G. Xiang[3], G. G. Teng[1,2], A. Mak[1,2], S. H. Tay[1,2], V. W. W. Ng[4], J. Z. E. Koh[4], W. Fong[2,5,6], L. C. Chew[2,5,6], A. Low[2,5,6], A. Law[5,6], Y. J. Poh[5], S. I. Yeo[5], Y. Y. Leung[5,6], W. R. Goh[7], C. T. Yu[7], N. E. Roslan[7], S. Angkodjojo[7], K. F. Phang[8], T. Arkachaisri[6,9], M. Sriranganathan[10], T. C. Tan[11], P. Cheung[1,2], M. Lahiri[1,2]. *[1]National University Hospital, Division of Rheumatology, Department of Medicine, Singapore, Singapore; [2]National University of Singapore, Department of Medicine, Singapore, Singapore; [3]Tan Tock Seng Hospital, Rheumatology, Singapore, Singapore; [4]National University of Singapore, Medical School, Singapore, Singapore; [5]Singapore General Hospital, Rheumatology and Immunology, Singapore, Singapore; [6]Duke-NUS Medical School, Rheumatology, Singapore, Singapore; [7]Sengkang General Hospital, Rheumatology, Singapore, Singapore; [8]Alexandra Hospital, Rheumatology, Singapore, Singapore; [9]KK Women's and Children's Hospital, Rheumatology, Singapore, Singapore; [10]Changi General*

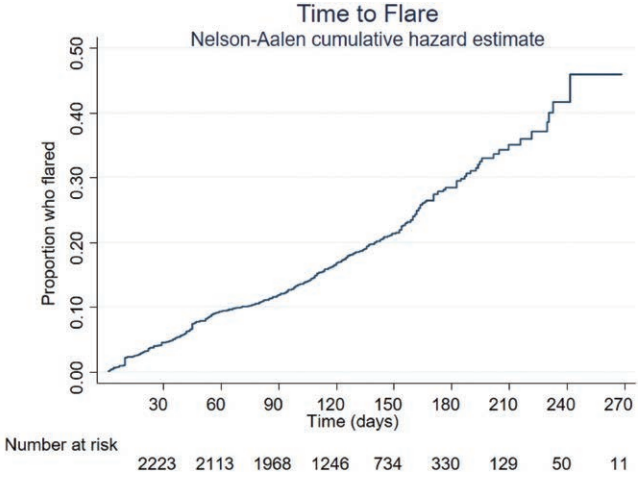

Figure 1. Nelson-Aalen curve of flares over time

Hospital, Rheumatology, Singapore, Singapore; [11]Khoo Teck Puat Hospital, Rheumatology, Singapore, Singapore

Background: Published data suggest no increased rate of flare of autoimmune inflammatory rheumatic diseases (AIIRD) after COVID-19 mRNA vaccination; however, the studies are limited by small sample size, short follow up or at risk of selection bias (voluntary physician reports or patient surveys).
Objectives: To study flares of AIIRD within three months of the first dose of an anti-SARS-COV2 mRNA vaccine.
Methods: A retrospective cohort study of consecutive AIIRD patients ≥ 12 years old, across six public hospitals in Singapore who received at least one dose of an mRNA (Pfizer/BioNTech or Moderna) vaccine. Data were censored at the first post-vaccine clinic visit when the patient had flared or if ≥ three months had elapsed since the first dose of the vaccine, whichever came first. Predictors of flare were determined by Cox proportional hazards analysis and time to flare was examined using a Nelson Aalen cumulative hazard estimate (Figure 1).
Results: 2339 patients (74% Chinese, 72% female) of median (IQR) age 64 (53, 71) years were included in the interim analysis (Table 1). 2112 (90%) had the Pfizer/BioNTech vaccine and 195 (8%) had Moderna, with a median (IQR) interval of 21 (21, 23) days between the two doses. The most common AIIRD diagnoses were Rheumatoid arthritis (1063, 45%), Psoriatic arthritis (296, 12.6%) and Systemic lupus erythematosus (SLE) (288, 12.3%). 186 (8%) were treated with biologics/ targeted disease modifying agents. 2125 (91%) patients were in low disease activity or remission. Treatment was interrupted for vaccination in only 18 (0.8%) patients. Seven (0.3%) patients had previous COVID-19 infection.

Table 1. Patient characteristics

Baseline characteristics	No flares (n = 1887, %)	Flares within 0—3 months of 1st vaccine dose (n= 272, %)	Flares outside of 0 – 3 months after 1st vaccine dose (n = 180, %)
Age (median years, IQR)	64 (53, 71)	61 (50, 69)	65 (55, 71)
Race			
Chinese	1386 (73)	206 (76)	129 (72)
Malay	193 (10)	28 (10)	20 (11)
Indian	195 (10)	27 (10)	26 (14)
Gender	1367 (72)	200 (74)	117 (65)
Female			
Vaccine type			
Pfizer/BioNTech	1713 (92)	239 (90)	160 (90)
Moderna	149 (8)	28 (10)	18 (10)
Diagnosis			
Rheumatoid Arthritis	831 (44)	139 (51)	93 (52)
Systemic Lupus Erythematosus	269 (14)	20 (7)	9 (5)
Psoriatic Arthritis	225 (12)	42 (15)	29 (16)
Spondyloarthropathies	141 (7)	21 (7)	17 (9)
Sjogren's Syndrome	114 (6)	15 (6)	8 (4)
Systemic sclerosis	94 (5)	4 (1)	6 (3)
Baseline Physician Disease Activity			
Remission	1007 (53)	99 (36)	63 (35)
Low Disease Activity	731 (39)	128 (47)	97 (54)
Moderate Disease Activity	134 (7)	40 (15)	20 (11)
High Disease Activity	15 (1)	5 (2)	0

452 (19%) flares were recorded during 9798.8 patient-months [4.6/100 patient-months, median (IQR) follow up duration 4.2 (3.3, 5.3) months], of which 272 (11.6%) patients flared within the 3-month period of interest and 180 (7.7%) flared outside of the 3-month period (Table 1). Median (IQR) time-to-flare was 40.5 (18, 56.6) days. 60 (22.1%) were mild and self-limiting, 170 (62.5%) were mild-moderate and 42 (15.4%) were severe. 190 (69.8%) of those who flared required escalation of treatment and 15 (5.5%) required hospital admission. 239 (10.2%) had improved disease activity after the vaccine.
On multivariate Cox regression analysis, patients in the oldest age tertile [median (IQR) 74 (71, 79) years] were less likely to flare [HR 0.80 (95% CI 0.63, 1.00), p = 0.05] Patients with inflammatory arthritis (compared with connective tissue disease, vasculitis and others) and patients with baseline active disease were more likely to flare [HR 1.72 (95% CI 1.35, 2.20), p < 0.001 and 1.82 (95% CI 1.39, 2.39), p < 0.001 respectively]
Conclusion: There was a moderately high rate of AIIRD flares after mRNA vaccination; however, there was no clustering of flares in the immediate post-vaccine period to suggest causality. Older patients were less likely to flare, while those with inflammatory arthritis and active disease at baseline were more likely to flare.
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Novartis
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POS0201 COVID-19 SEVERITY AND VACCINE BREAKTHROUGH INFECTIONS IN IDIOPATHIC INFLAMMATORY MYOPATHIES, OTHER SYSTEMIC AUTOIMMUNE AND INFLAMMATORY DISEASES, AND HEALTHY INDIVIDUALS: RESULTS FROM THE COVID-19 VACCINATION IN AUTOIMMUNE DISEASES (COVAD) STUDY.

L. Gupta[1,2], L. S. Hoff[3], N. R[2], P. Sen[4], S. Katsuyuki Shinjo[3], J. Day[5,6,7], J. B. Lilleker[8,9], V. Agarwal[10], S. Kardes[11], M. Kim[12], A. Makol[13], M. Milchert[14], T. A. Gheita[15], B. Salim[16], T. Velikova[17], A. E. Gracia-Ramos[18], I. Parodis[19,20], A. Selva-O'callaghan[21], E. Nikiphorou[22,23], T. Chatterjee[12], A. L. Tan[24,25], A. Nune[26], L. Cavagna[27,28], M. A. Saavedra[29], N. Ziade[30,31], J. Knitza[32], M. Kuwana[33], O. Distler[34], H. Chinoy[8,35,36], V. Agarwal[2], R. Aggarwal[37]on behalf of COVID-19 Vaccination in Autoimmune Diseases (COVAD) Study Group. *[1]Royal Wolverhampton Hospitals NHS Trust, Department of Rheumatology, Wolverhampton, United Kingdom; [2]Sanjay Gandhi Postgraduate Institute of Medical Sciences, Department of Clinical Immunology and Rheumatology, Lucknow, India; [3]Universidade de Sao Paulo Faculdade de Medicina FMUSP, Division of Rheumatology, Sao Paulo, Brazil; [4]Maulana Azad Medical College, Undergraduate, New Delhi, India; [5]Royal Melbourne Hospital, Department of Rheumatology, Parkville, Australia; [6]Walter and Eliza Hall Institute of Medical Research, -, Parkville, Australia; [7]University of Melbourne, Department of Medical Biology, Parkville, Australia; [8]School of Biological Sciences, The University of Manchester, Division of Musculoskeletal and Dermatological Sciences, Manchester, United Kingdom; [9]Manchester Centre for Clinical Neurosciences, Neurology, Salford, United Kingdom; [10]Mahatma Gandhi Mission Medical College, Navi Mumbai, India; [11]Istanbul University Faculty of Medicine, Department of Medical Ecology and Hydroclimatology, Istanbul, Turkey; [12]University of Illinois College of Medicine at Peoria, Department of Internal Medicine, Peoria, United States of America; [13]Mayo Clinic, Division of Rheumatology, Rochester, United States of America; [14]Pomeranian Medical University in Szczecin, Department of Internal Medicine, Rheumatology, Geriatrics and Clinical Immunology, Szczecin, Poland; [15]Kasr Al Ainy School of Medicine, Cairo University, Department of Rheumatology, Cairo, Egypt; [16]Fauji Foundation Hospital, Department of Clinical Immunology, Rawalpindi, Pakistan; [17]University Hospital "Lozenetz", Sofia University, Department of Clinical Immunology, Sofia, Bulgaria; [18]General Hospital, National Medical Center "La Raza", Instituto Mexicano del Seguro Social, Department of Internal Medicine, Mexico City, Mexico; [19]Karolinska Institutet and Karolinska University Hospital, Division of Rheumatology, Stockholm, Sweden; [20]Örebro University Faculty of Medicine and Health, Department of Rheumatology, Örebro, Sweden; [21]Vall D'hebron General Hospital, Universitat Autonoma de Barcelona, Department of Internal Medicine, Barcelona, Spain; [22]King's College London, Centre for Rheumatic Diseases, London, United Kingdom; [23]King's College Hospital, Department of Rheumatology, London, United Kingdom; [24]Leeds Teaching Hospitals Trust, NIHR Leeds Biomedical Research Centre, Leeds, United Kingdom; [25]University of Leeds, Leeds Institute of Rheumatic and Musculoskeletal Medicine, Leeds, United*