Objectives: Explore publicly available transcriptomic dataset of patients infected with SARS-COV2 compared to uninfected to identify differentially expressed genes (DEGs) related to the immune system that might be pathogenic in RA synovium. Then explore the effect of Disease-Modifying Drugs on their local expression that might give hints about their possible mechanism of action.

Methods: RNAseq dataset (GSE147507) were retrieved using the Gene Expression Omnibus (GEO) and used to identify DEGs between infected and uninfected lung samples using BioJupies tools [3]. The DEGs were explored for common pathways using Metascape online tool (<http://metascape.org>) [10], as shown in figure (1). The chemokines genes were filtered out, and their common receptor (CR) was identified. The immune cells that express a higher level of the identified receptor were explored using DICE project tool (<https://dice-database.org/>). The expression of CR was searched in a microarray dataset (GSE77298) of synovial biopsies of RA and healthy controls. RNAseq dataset (GSE97165) of synovial biopsies taken from 19 early RA patients at baseline and after six months of Triple Disease-Modifying Anti-rheumatic drugs (tDMARD; methotrexate, sulfasalazine, and hydroxychloroquine) treatment.

Results: 84 DEGs were identified between uninfected and COVID-19 infected lung samples. These DEGs were enriched in pathways specific to (response to the virus, response to interferon, leukocyte activation, and chemotaxis). Interestingly, SARS-COV-2 infected lungs express more CCL4, CCL8, and CCL11; the three ligands shared the same receptor, which is CCR5. Top immune cells that express CCR5 were CD4 T memory T reg cells, Th17, Th1, and monocytes. CCR5 was significantly upregulated in RA compared to healthy controls synovium ($p=0.04$) and was dramatically downregulated after six months of tDMARD treatment ($p=0.004$), as shown in figure (2).

Conclusion: Using publicly available transcriptomic datasets properly highlighted the possible beneficiary effect of DMARDs in patients with COVID-19, which can block CCR5 rich immune cells recruitment.

References:

- [1] Favalli, E.G., et al., *COVID-19 infection and rheumatoid arthritis: Faraway, so close!* Autoimmun Rev. 2020. 19(5): p. 102523.
- [2] Gianfrancesco, M.A., et al., *Rheumatic disease and COVID-19: initial data from the COVID-19 Global Rheumatology Alliance provider registries.* The Lancet Rheumatology, 2020. 2(5): p. e250-e253.
- [3] Torre, D., A. Lachmann, and A. Ma'ayan, *BioJupies: Automated Generation of Interactive Notebooks for RNA-Seq Data Analysis in the Cloud.* Cell Systems, 2018. 7(5): p. 556-561.e3.

Figure 1. Flowchart of transcriptomic analysis

Figure 2. (A) Top immune cells that express CCR5 (B) CCR5 expression in synovial biopsies of RA and control (C) CCR5 expression at baseline and after 6 months of tDMARD treatment.

Disclosure of Interests: None declared

DOI: 10.1136/annrheumdis-2020-eular.6801

Talk about the consequences of COVID-19 on RMDs

CO0003 TREATMENT WITH BIOLOGICAL THERAPIES AND RISK OF BEING ADMITTED TO THE HOSPITAL FOR COVID19 INFECTION

C. Gonzalez^{1,2,3}, L. A. Menchén Viso^{1,2,3}, O. Baniandrés Rodríguez^{1,2,3}, A. Herranz Alonso^{1,2}, C. Lobo Rodríguez^{1,2,3}, J. C. Nieto^{1,2,3}, I. Monteagudo Sáez^{1,2}, I. Marín Jiménez^{1,2}, A. López¹, A. López¹, A. Ais Larisgoitia⁴, E. Chamorro de Vega¹, P. Morales de Los Ríos¹, M. J. Lizcano¹, J. M. Alvaro Gracia^{1,2,3}, S. García de San José^{1,2}. ¹Gregorio Marañón University Hospital, CEIMI, Madrid, Spain; ²Instituto de Investigación Sanitaria Gregorio Marañón, Madrid, Spain; ³Universidad Complutense de Madrid, Madrid, Spain; ⁴Gregorio Marañón University Hospital, CEIMI, Madrid, Spain

Objectives: To analyze the risk of admission for COVID19 infection and outcome of patients treated with bDMARD or tsDMARD from our biologic therapy center, to compare with all patients admitted for COVID-19 infection in our hospital.

Methods: Records of the patients from our center admitted for COVID-19 infection between March 8 and May 8, 2020 were analyzed retrospectively. Age, gender, and outcome of all patients admitted for COVID19 infection to our hospital on the same dates were collected. Chi-square, Student's t and Man-Whitney U tests were used for comparisons when appropriate.

Results: 1,668 patients with inflammatory diseases treated with bDMARD or tsDMARD were included. Median age 53.0 years (range 17-91), 52.4% women. Diagnoses and DMARD distribution are shown in tables 1 and 2. 19/1668 (1.1%; 6.8 patient-years) were admitted for severe COVID19 infection. Mortality ratio: 4/19 (21.1%). Median age of the admitted patients was higher: 61.0y (SD 14.2) vs 53.0y (SD 15.0); $p < 0.009$. Median age of deceased patients was also higher 69.5y (SD 20.3) vs 53.0y (SD 15.0); p : NS. Female gender had a worse prognosis trend: 52.4% of all group, 68.4% of those hospitalized, 75.0% of those who died. Females had a higher median age than men: 55.0y (SD 14.9) vs. 50.0y (SD 14.9); $p < 0.001$.

When comparing patients treated with DMARD admitted for COVID19 infection with all patients hospitalized for the same reason (4,601 patients), no differences were found neither in age (61.0y [SD 14.2] vs 58.3y [SD 18.1]; NS) nor gender (female: 68.4% vs 54.7%; NS). However, DMARD group seemed to have higher mortality: 4/19 (21.1%) vs 551/4601 (12.0%); p : NS, at a younger age: 69.5y (SD 20.3) vs 82.4 (SD 11.4); p : NS.

Rheumatoid arthritis patients were admitted more frequently: (9/392 (2.3%) vs 10/1276 (0.8%); $p < 0.025$. And were older: median 62y (SD 13.5) vs 50.0y (SD 14.4); $p < 0.001$.

Patients treated with anti-TNF suffered less admissions: 6/1055 (0.6%) vs 13/613 (2.1%); $p < 0.001$ and were younger: median 51.0y (SD 15.0) vs 55.0y (SD 14.7); $p < 0.001$. Anti-TNF were less used in patients with rheumatoid arthritis 188/392 (48.0%) vs 867/1276 (67.9%); $p < 0.001$.

Table 1.

Disease	N (%)	Admitted	deaths
Rheumatoid arthritis	392 (23.5%)	9/392 (2.3%)	1
Spondylarthritis	277 (16.6%)	2/277 (0.7%)	1
Psoriatic arthritis	124 (7.4%)	1/124 (0.8%)	0
JIA	30 (1.8%)	0/30 (0.0%)	0
CTD	31 (1.9%)	1/31 (3.2%)	1
Vasculitis	20 (1.2%)	0/20 (0.0%)	0
IBD	582 (34.9%)	4/578 (0.7%)	1
Psoriasis	202 (12.1%)	2/202 (1.0%)	0
Others	10 (0.6%)	0/10 (0.0%)	0
TOTAL	1,668 (100%)	19/1668 (1.1%)	4/19 (21.1%)

JIA: Juvenile Idiopathic Arthritis; CTD: Connective Tissue Disease; IBD: Inflammatory Bowel Disease

Table 2.

Treatment	N (%)	Admitted	deaths
Anti-TNF	1055 (63.2%)	6/1055 (0.6%)	2
Anti-CD20	79 (4.7%)	3/79 (3.8%)	1
Anti-IL6	96 (5.8%)	3/96 (3.1%)	0
CTLA4-Ig	44 (2.6%)	3/44 (6.8%)	1
Anti-IL17	92 (5.5%)	2/92 (2.2%)	0
Anti-IL12/23	143 (8.6%)	1/143 (0.7%)	0
Anti-integrin	79 (4.7%)	0/79 (0.0%)	0
JAK inhibitor	34 (2.0%)	1/34 (2.9%)	0
PDE4 inhibitor	32 (1.9%)	0/32 (0.0%)	0
Anti-IL23	14 (0.8%)	0/14 (0.0%)	0
TOTAL	1,668 (100%)	19/1668 (1.1%)	4/19 (21.1%)

Conclusion: It seems reasonable that patients with inflammatory diseases treated with bDMARD or tsDMARD continue their treatment during the COVID19 epidemic. The different rates of hospitalization based on the diagnosis or DMARD may be due to comorbidity, confounding by indication and other bias. The study is not powerful enough to study these confounders.

Disclosure of Interests: Carlos Gonzalez Consultant of: Gilead, Janssen, Novartis, Speakers bureau: Abbvie, Celgene, Gilead, Janssen, Novartis, Pfizer, Roche, Luis Alberto Menchén Viso Grant/research support from: Abbvie, Janssen, MSD, Takeda, Consultant of: Abbvie, Janssen, Takeda, MSD, Medtronic, Tillotts, Pfizer, Dr. Falk Pharma, Speakers bureau: Abbvie, Janssen, Takeda, MSD, General Electric, Tillotts, Pfizer, Ferring, General Electric, Fresenius, Ofelia Baniandrés Rodríguez: None declared, Ana Herranz Alonso: None declared, Carmen Lobo Rodríguez: None declared, Juan Carlos Nieto Speakers bureau: Pfizer, Abbvie, MSD, Novartis, Janssen, Lilly, Nordic Pharma, BMS, Gebro, FAES Farma, Roche, Sanofi, Indalecio Monteagudo Sáez: None declared, Ignacio Marín Jiménez: None declared, Amparo López: None declared, Ana López: None declared, Arantza Ais Larisgoitia: None declared, Esther Chamorro de Vega: None declared, Paloma Morales de los Ríos: None declared, Maria Jesus Lizcano: None declared, Jose Maria Alvaro Gracia: None declared, Sonia García de San José: None declared

DOI: 10.1136/annrheumdis-2020-eular.6817

OLDER AGE, CARDIOVASCULAR COMORBIDITY AND GLUCOCORTICOSTEROIDS ARE RISK FACTORS FOR COVID-19 HOSPITALISATION IN PATIENTS WITH INFLAMMATORY RHEUMATIC DISEASES: FIRST RESULTS OF THE GERMAN COVID-19-IRD REGISTRY

A. Regierer¹, R. Hasseli², B. Hoyer³, A. Krause⁴, H. M. Lorenz⁵, A. Pfeil⁶, J. Richter⁷, T. Schmeiser⁸, C. Specker⁹, A. Strangfeld¹, R. Voll¹⁰, H. Schulze-Koops¹¹, U. Müller-Ladner². ¹Deutsches Rheuma-Forschungszentrum (DRFZ), Epidemiology, Berlin, Germany; ²Kerckhoff-Klinik, Bad Nauheim, Germany; ³University Hospital Kiel, Kiel, Germany; ⁴Immanuel Hospital Berlin (Wannsee site), Berlin, Germany; ⁵University Hospital Heidelberg, Heidelberg, Germany; ⁶Jena University Hospital, Jena, Germany; ⁷Universitätsklinikum Düsseldorf, Düsseldorf, Germany; ⁸Hospital St. Joseph, Wuppertal, Germany; ⁹Kliniken

Essen-Mitte, Essen, Germany, Department of Rheumatology and Clinical Immunology, Essen, Germany; ¹⁰Universitätsklinikum Freiburg, Freiburg im Breisgau, Germany; ¹¹Universität München, Division of Rheumatology, München, Germany

Background: Patients with inflammatory rheumatic diseases (IRD) and infection with SARS-CoV-2 may be at risk to develop a severe course of COVID-19. To gather knowledge about SARS-CoV-2 infections in IRD patients, a national registry was established to elucidate IRD specific profiles of COVID-19.

Objectives: To identify risk factors for hospitalisation.

Methods: Patients from the German registry on SARS-CoV-2 infection in IRD were analysed. Patients are enrolled with a pre-existing IRD and a positive lab-result for a SARS-CoV-2 infection. The main outcome parameter was hospitalisation versus non-hospitalisation. Multivariable logistic regression was used to estimate odds ratios (OR) and 95% confidence intervals (CI). Covariates included in the model were age group, gender, key comorbidities (cardiovascular, lung diseases, chronic renal insufficiency), prior and/or current use of glucocorticosteroids (GC) or NSAIDs and remission.

Results: Until May 17th, 2020, data from 192 IRD patients with SARS-CoV-2 infection were reported (67 males; 124 females; 1 diverse). 64 patients were hospitalised, 21 patients were ventilated non-invasively/invasively and 15 patients died.

Baseline characteristics are shown in table 1, stratified into the patient groups non-hospitalisation, hospitalisation without ventilation, and hospitalisation with ventilation. Non-hospitalised patients were younger, had less comorbidities and were less often treated with GC. In the group of hospitalised patients compared to non-hospitalised patients more patients were male (42% vs 32% male) with an even higher proportion in the ventilated patient group (57% male).

In the multivariable logistic regression model, age > 65 years (OR 5.1; 95%CI 2.3-11.4), cardiovascular comorbidity (OR 2.3; 95%CI 1.0-5.0), and prior and/or current treatment with GC (OR 2.6; 95%CI 1.2-5.4) were independently associated with hospitalisation.

Parameter, N (%)	Non-hospitalisation 128 (66.7)	Hosp. without ventilation 42 (22.4)	Hosp. with ventilation 21 (10.9)
Age [years], mean (SD)	53.8 (13.4)	65.2 (15.5)	69.7 (9.9)
Female	87 (68.5)	28 (65.1)	9 (42.9)
RA	60 (46.9)	24 (55.8)	12 (57.1)
Psoriasis	23 (18)	3 (7)	3 (14.3)
Axial spondyloarthritis	14 (10.9)	2 (4.7)	0
Lupus	7 (5.5)	1 (2.3)	0
Remission of IRD	67 (52.3)	23 (53.5)	4 (19)
Number of comorbidities, mean (SD)	1 (1.2)	1.8 (1.4)	2.4 (1.5)
Cardiovascular disease	42 (32.8)	25 (58.1)	16 (76.2)
Pulmonary disease	16 (12.5)	8 (18.6)	8 (38.1)
Chronic renal insufficiency	5 (3.9)	7 (16.3)	4 (19)
Cancer	2 (1.6)	4 (9.3)	2 (9.5)
Obesity (BMI > 30)	23 (18)	5 (11.6)	3 (14.3)
Diabetes	3 (2.3)	7 (16.3)	4 (19)
Other comorbidities	20 (15.6)	9 (20.9)	6 (28.6)
csDMARD (without HCQ)	59 (46.1)	25 (58.1)	8 (38.1)
HCQ	13 (10.2)	1 (2.3)	2 (9.5)
bDMARD	48 (37.5)	15 (34.9)	8 (38.1)
tsDMARD	5 (3.9)	1 (2.3)	1 (4.8)
Glucocorticosteroids	47 (37)	29 (67.4)	13 (61.9)
NSAIDs	21 (16.4)	5 (11.6)	1 (4.8)

Conclusion: As has been described for COVID-19 in general, also in IRD male gender may be associated with a more severe course of the infection as the descriptive analysis of data shows. Risk factors for SARS-CoV-2 infection-dependent hospitalisation in IRD patients include age (>65 years), cardiovascular comorbidities, and prior and/or current treatment with GC.

Disclosure of Interests: Anne Regierer Speakers bureau: Novartis, Celgene, Janssen-Cilag, Rebecca Hasseli Grant/research support from: Pfizer, Consultant of: Pfizer, Gilead, Novartis, Celgene, Abbvie, Medac, Bimba Hoyer: None declared, Andreas Krause: None declared, Hanns-Martin Lorenz Grant/research support from: Consultancy and/or speaker fees and/or travel reimbursements: Abbvie, MSD, BMS, Pfizer, Celgene, Medac, GSK, Roche, Chugai, Novartis, UCB, Janssen-Cilag, Astra-Zeneca, Lilly. Scientific support and/or educational seminars and/or clinical studies: Abbvie, MSD, BMS, Pfizer, Celgene, Medac, GSK, Roche, Chugai, Novartis, UCB, Janssen-Cilag, Astra-Zeneca, Lilly, Baxter, SOBI, Biogen, Actelion, Bayer Vital, Shire, Octapharm, Sanofi, Hexal, Mundipharma, Thermo Fisher., Consultant of: see above, Alexander Pfeil Grant/research support from: This study Investigator Initiated Study "Automatic assessment of joint space narrowing in rheumatoid arthritis based on the Post-hoc analysis" (number: