level. SARS-CoV-2 infection was confirmed in 84 patients (96.5%). The diagnosis was confirmed by RT-PCR in 74 patients and by antibody test in 10. 18 patients met the clinical criteria and diagnosed with MIS-C. Nine of them had also hypotension and seven patients admitted the intensive care unit because of shock and severe end-organ illness. COVID-19 outbreak also caused exacerbation of systemic disease in 56 children due to a discontinue of medication, postponed drug switch, or viral infection triggered.

Conclusion: In conclusion, children with rheumatic disease do not appear to present a higher risk of severe COVID-19. Whether these patients receive biological treatment does not affect the severity of the disease, but it is still not true to say that these drugs are protective. The immunosuppressive treatments can be adjusted in case of infection, otherwise it is not recommended interrupt the treatments. Physicians should be cautious about the hyperinflammatory syndrome associated with COVID-19 in rheumatic children, which may be severe in this group of patients and may be confused with primary diseases.

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Disclosure of Interests: None declared.

DOI: 10.1136/annrheumdis-2021-eular.1164

POS0050

ARE PATIENTS WITH IMMUNE MEDIATED INFLAMMATORY DISEASES (IMID) MORE LIKELY TO RECEIVE COVID-19 TESTS AND TEST POSITIVE FOR SARS-COV-2? A MATCHED POPULATION-BASED STUDY

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Background: Population-based data about the COVID-19 risk in patients with IMID remain scarce.

Objectives: To investigate the cumulative incidence and risk factors for laboratory-confirmed COVID-19 infection and SARS-CoV2 testing in patients with IMID compared with matched non-IMID patients from the general population.

Methods: A population-based, matched cohort study was conducted using health administrative data from adults living in Ontario, Canada from January to December 2020. Cohorts for each of the following IMID were assembled: rheumatoid arthritis (RA), psoriasis, psoriatic arthritis, ankylosing spondylitis, systemic autoimmune rheumatic diseases (including lupus, systemic sclerosis, Sjogren's, inflammatory myositis), multiple sclerosis (MS), iritis, inflammatory bowel disease (IBD), polymyalgia rheumatica (PMR) and vasculitis. Each patient was matched with 5 non-IMID comparators based on age, sex, area of residence and living in long term care (LTC). Standardized cumulative rates of testing for SARS-CoV2, and for receiving a positive test between IMID and non-IMID were compared between IMID and non-IMID patients. Multivariable logistic regression analyses assessed sociodemographic factors associated with COVID-19 testing and positivity.

Results: A total of 493,499 IMID patients and 2,466,946 non-IMID comparators were assessed. Significantly more IMID patients versus non-IMID were tested for SARS-CoV2 (27.4% vs. 22.7%), while the proportions of those positive for COVID-19 were identical (0.9% of all patients in both groups). Overall, IMID patients were more likely to undergo SARS-CoV2 testing (odds ratio (OR) 1.28, 95% CI 1.27, 1.29), but their overall risk of laboratory-confirmed COVID-19 was not elevated (OR 0.97 (95% CI 0.93, 1)). However, the risk of laboratory-confirmed COVID-19 infection was lower in IBD (OR 0.75), MS (OR 0.77) and psoriasis (OR 0.94) and marginally higher in RA (OR 1.07) and iritis (OR 1.13) compared with non-IMID comparators (Figure 1A). The highest standardized rates of COVID-19 infection were found in vasculitis (115 per 10,000 patients) and iritis (109 per 10,000 patients) (Figure 1B). Risk factors for COVID-19 infection included younger age, living in LTC, multimorbidity, urban living and lower income (Table 1).

Conclusion: Patients across all IMID were more likely to be tested for COVID-19 versus non-IMID patients. IMID patients were not at higher risk for testing positive for COVID-19 as an overall group, yet risk varied across disease subgroups.

Figure 1 – Laboratory confirmed COVID-19 Risk in IMID vs. Non-IMID by multivariable regression analysis (1A) and standardized cumulative incidence (1B)

Table 1. Factors associated with COVID-19 infection in IMID vs. Non-IMID – Multivariable Logistic Regression

Variable	OR	CI 95%
IMID vs. Non-IMID	0.97	0.93, 1.00
Age (10-year increase)	0.89	0.89, 0.90
Sex: Female vs. Males	0.95	0.93, 0.97
LTC	18.64	17.9, 19.42
ADG score:		
•5-9 vs. 0-4	1.40	1.35, 1.45
•10-14 vs. 0-4	1.73	1.67, 1.80
•15+ vs. 0-4	1.18	1.13, 1.23
Urban vs. Rural	3.49	3.26, 3.72
Income quintile		
•Quintile 2 vs. 1	0.92	0.89, 0.96
•Quintile 3 vs. 1	0.90	0.86, 0.93
•Quintile 4 vs. 1	0.73	0.70, 0.76
•Quintile 5 vs. 1	0.60	0.58, 0.63

ADG - Aggregated Diagnosis Groups; IMIDs - Immune mediated inflammatory disease; LTC - long term care

Acknowledgements: The study is supported by ICES, which is funded by an annual grant from the Ontario Ministry of Health and Long-Term Care (MOHLTC). Parts of this material are based on data and information compiled and provided by MOHLTC and the Canadian Institute for Health Information. The opinions, results and conclusions reported in this paper are those of the authors and are independent of the funding or data sources; no endorsement is intended or should be inferred.

Disclosure of Interests: None declared.

DOI: 10.1136/annrheumdis-2021-eular.1647

POS0051

THE IMPACT OF COVID-19 ON RHEUMATOLOGY TRAINING: RESULTS FROM THE COVID-19 GLOBAL RHEUMATOLOGY ALLIANCE TRAINEE SURVEY

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Background: The COVID-19 pandemic has disrupted healthcare delivery and education of physicians, including rheumatology trainees.

Objectives: To assess the impact of the COVID-19 pandemic on the clinical experiences, research opportunities, and well-being of rheumatology trainees.

Methods: A voluntary, anonymous, web-based survey was administered in English, Spanish, or French from 19/08/2020 to 05/10/2020. Adult and paediatric rheumatology trainees worldwide in training in 2020 were invited to participate via social media and email. Using multiple choice questions, Likert scales, and free text answers, we assessed trainee patient care activities, redeployment, research, and well-being.

Results: The 302 respondents were from 33 countries, with most (83%, 252/302) in adult rheumatology training. Many trainees (45%, 135/300) reported an increase in non-rheumatology clinical work (e.g. care of COVID-19 patients), with 52% of these (70/135) also continuing rheumatology clinical work. COVID-19 redeployment was not optional for 68% (91/134).

Trainees reported a negative impact of the pandemic in their growth in rheumatology (Figure 1). They also reported a substantial impact on several training areas: outpatient clinics (79%, 238/302), inpatient consultations (59%, 177/302), formal teaching (55%, 167/302), procedures (53%, 147/302), teaching opportunities (52%, 157/302), and ultrasonography (36%, 110/302), with 87-96% perceiving a negative impact on these areas. Only 54% (159/294) reported feeling comfortable with their level of clinical supervision during the pandemic (Figure 1). Many trainees (46%, 128/280) reported changes in research experiences during the pandemic; 39% (110/285) reported that COVID-19 negatively affected their ability to continue their pre-pandemic research and 50% (142/285) reported difficulty maintaining research goals (Figure 1).

Some rheumatology trainees reported having health condition(s) putting them at high risk for COVID-19 (10%, 30/302) and 14% of trainees (41/302) reported having had COVID-19 (Table 1). Only 53% (160/302) reported feeling physically safe in the workplace while 25% (76/302) reported not feeling physically safe; reasons included lack of training about COVID-19, lack of comfort in the clinical setting, insufficient personal protective equipment, immunocompromised state, and pregnancy. Half (151/302) reported burnout and 68% (204/302) an increase in stress from work during the pandemic (Figure 1), whilst 25% (75/302) reported that changes to their training programme negatively impacted their physical health.

Conclusion: The COVID-19 pandemic has negatively impacted the experience of rheumatology training as well as the well-being of trainees globally. Our data highlight concerns for rheumatology trainees including research opportunities and clinical care which should be a focus for curriculum planning.

Figure 1. Rheumatology trainee perceptions of pandemic impact and changes in training programme.

Table 1. Rheumatology trainees reporting health vulnerabilities or having acquired COVID-19. Data is presented as n (%). Rest of the world (ROW) data includes the United States (116), Asia (50), Central and South America (23), Canada (12), Australia (8), and Africa (4).

	Europe n = 89	ROW n = 213	Combined n = 302
Disability	1 (1)	9 (4)	10 (3)
High risk	7 (8)	23 (11)	30 (10)
Pregnant	4 (5)	15 (7)	19 (6)
Shielding/Quarantining	12 (13)	70 (33)	82 (27)
Acquired COVID-19	20 (22)	21 (10)	41 (14)

Disclosure of Interests: Kristen Young: None declared, Su-Ann Yeoh: None declared, Michael Putman: None declared, Elizabeth Graef: None declared, Francis Berenbaum: None declared, Richard Conway: None declared, Rebecca Grainger Speakers bureau: Speaker fees from Abbvie, Janssen, Novartis, Pfizer, Cornerstones, all not related to this work, Consultant of: Consultancy fees from Abbvie, Janssen, Novartis, Pfizer, Cornerstones, all not related to this work, Grant/research support from: Travel assistance from Pfizer, not related to this work, Adam Kilian: None declared, Maximilian Konig: None declared, Jean Liew Grant/research support from: Research grant from Pfizer unrelated to this

manuscript, Pedro M Machado Speakers bureau: Speaker fees from Abbvie, BMS, Celgene, Eli Lilly, Janssen, MSD, Novartis, Orphazyme, Pfizer, Roche and UCB, all unrelated to this manuscript, Consultant of: Consulting fees from Abbvie, BMS, Celgene, Eli Lilly, Janssen, MSD, Novartis, Orphazyme, Pfizer, Roche and UCB, all unrelated to this manuscript, Sebastian E. Sattui: None declared, Jeffrey Sparks Consultant of: Consultancy for Bristol-Myers Squibb, Gilead, Inova Diagnostics, Optum, and Pfizer unrelated to this manuscript, Grant/research support from: Research support from Bristol-Myers Squibb unrelated to this manuscript, Paul Sufka: None declared, Manuel Ugarte-Gil Grant/research support from: Research grants from Janssen and Pfizer unrelated to this manuscript, Laura Upton: None declared, Zachary Wallace: None declared, Jinoos Yazdany Consultant of: Consultancy for Astra Zeneca, Eli Lilly, and Pfizer, not related to this work, Grant/research support from: Research grants from Gilead and Pfizer, not related to this work, Arundathi Jayatilleke: None declared.

DOI: 10.1136/annrheumdis-2021-eular.2236

POS0052

PATHOPHYSIOLOGY OF ACUTE RESPIRATORY SYNDROME CORONAVIRUS 2 INFECTION: A SYSTEMATIC LITERATURE REVIEW TO INFORM EULAR POINTS TO CONSIDER

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Background: The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic is a global health problem. Beside the specific pathogenic effect of SARS-CoV-2, incompletely understood deleterious and aberrant host immune responses play critical roles in severe disease. Rheumatologists have the best experience of studying and treating these complicated hyperinflammatory processes.

Objectives: To summarize the available information on pathophysiology of COVID-19.

Methods: As part of a EULAR taskforce, two systematic literature reviews were performed one on pathophysiology and one on immunomodulatory therapies. Two reviewers independently identified eligible studies according to the following PICO framework: P (population): patients with SARS-CoV-2 infection; I (intervention): any intervention/no intervention; C (comparator): any comparator; O (outcome) any clinical or serological outcome including but not limited to immune cell phenotype and function and serum cytokine concentration. The results pertaining to pathophysiology of COVID-19 are presented here.

Results: Of the 55496 records yielded, 85 articles were eligible for inclusion. Included studies were at variable risk of bias and exploring various aspects of disease pathogenesis from immune to non-immune cells (Table 1). Pro-inflammatory cytokines' expression including IL-6, was increased, especially in severe COVID-19, although not as high as other states with severe systemic inflammation. Innate and adaptive immune cell compartments were differentially affected by SARS-CoV-2 infection: neutrophils displayed an immature differentiation state and also increased neutrophil extracellular traps (NETs) formation. Dendritic cell number was reduced and classical monocytes was increased although displaying a reduced expression of HLA-DR. The lymphoid compartment was also affected: lymphopenia was present with a reduced number of CD4+ and CD8+ T lymphocytes and more frequent PD1+CD8+ T cells corresponding to an exhausted phenotype. Antibody response to SARS-CoV-2 infection showed a high variability across individuals and disease spectrum. Multiparametric algorithms showed variable diagnostic performances in predicting survival, hospitalization, disease progression or severity, and mortality. Differences in SARS-CoV-2 manifestations in adults and children were highlighted.

Conclusion: Overall, SARS-CoV-2 infection affects both innate and adaptive immune responses in a variable way, according to both disease severity and individual parameters. This SLR informs the EULAR points to consider on pathophysiology and use of immunomodulatory therapies in COVID-19.