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OP0285 COVID-19 HOSPITALIZATIONS, ICU ADMISSION, AND DEATH AMONG PATIENTS WITH IMMUNE MEDIATED INFLAMMATORY DISEASES (IMID) – A POPULATION-BASED STUDY

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Background: It remains unclear whether patients with IMID are at greater risk for severe COVID-19.
Objectives: To investigate the risk of COVID-19 hospitalizations and their outcomes in patients with IMID compared with matched non-IMID patents from the general population.
Methods: A population-based, matched cohort study was conducted in adults living in Ontario, Canada using health administrative data. Ten cohorts of the following IMID were assembled: rheumatoid arthritis, psoriasis, psoriatic arthritis, ankylosing spondylitis, systemic autoimmune rheumatic diseases (SARDs, including systemic lupus, systemic sclerosis, Sjogren's, myositis), multiple sclerosis (MS), iritis, inflammatory bowel disease, polymyalgia rheumatica (PMR), and vasculitis (including giant cell arteritis and other types of vasculitidies). Each patient was matched with 5 non-IMID comparators based on age, sex, area of residence and living in long-term care (LTC). Patients who were admitted to hospital from January 1st to July 31th, 2020 and had ICD-10 COVID-19 diagnosis codes (U07.2 or U07.1) were identified. Among those with COVID-19 hospitalizations, we determined those with admissions to intensive care unit or required mechanical ventilation or died in hospital ('complicated hospitalization'). Age-sex-standardized rates were compared between IMID and non-IMID patients and risk factors for hospitalizations were identified by multivariable logistic regression analysis.
Results: In total, 493,499 IMID (417 hospitalized) and 2,466,946 non-IMID patients (1,519 hospitalized) were assessed. The age-sex-standardized rate of COVID-19 hospitalization was higher in IMID (6.4 per 10,000, 95% confidence interval (CI) 5.8, 7.2) versus non-IMID patients (4.8 per 100,000, 95% CI 4.5, 5). The highest rates of hospitalizations were found in vasculitis (18/10,000), MS (16.7/10,000) and PMR (10.1/10,000). IMID diagnosis was associated with 37% higher risk of being hospitalized for COVID-19 (Odds Ratio (OR) 1.37, 95% CI 1.23, 1.53) (Figure 1). This risk was slightly attenuated after adjusting for sociodemographic factors and comorbidities but remained elevated by 23% compared to non-IMID (OR 1.23, 95% CI 1.10, 1.37). The risk for hospitalizations was increased in RA, vasculitis, SARDs, PsA, MS and iritis (Figure 1). Risk factors for COVID-19 hospitalizations included older age, male sex, lower income, multimorbidity and living in long-term care (Table 1). The risk for complicated COVID-19 hospitalizations was higher by 21% in IMID patients (OR 1.21, 95% CI 1.02, 1.43), however, this association was attenuated after adjustment for demographics and comorbidities (OR 1.08).

Table 1. Risk Factors for COVID-19 Hospitalizations in IMIDs vs. non-IMIDs

Variable	OR	95% CI
IMIDs vs. Non-IMID	1.23	1.10, 1.37
Age (10 yrs)	1.49	1.44, 1.54
Sex: Female	0.68	0.62, 0.75
Long term care resident	8.28	7.32, 9.37
ADG: 5-9 vs. 0-4	1.45	1.22, 1.71
10-14 vs. 0-4	2.26	1.92, 2.67
15+ vs. 0-4	3.23	2.73, 3.82
Income (quintile)		
Quintile 2 vs. 1	0.82	0.73, 0.93
Quintile 3 vs. 1	0.76	0.67, 0.86
Quintile 4 vs. 1	0.56	0.48, 0.64
Quintile 5 vs. 1	0.46	0.40, 0.54
Urban vs. rural	4.33	3.32, 5.67

ADG - Aggregated Diagnosis Groups

Conclusion: Patients with IMID were at higher risk of being hospitalized with COVID-19 and for having complicated hospitalizations. Hospitalization risk was partially independent of their comorbid conditions.
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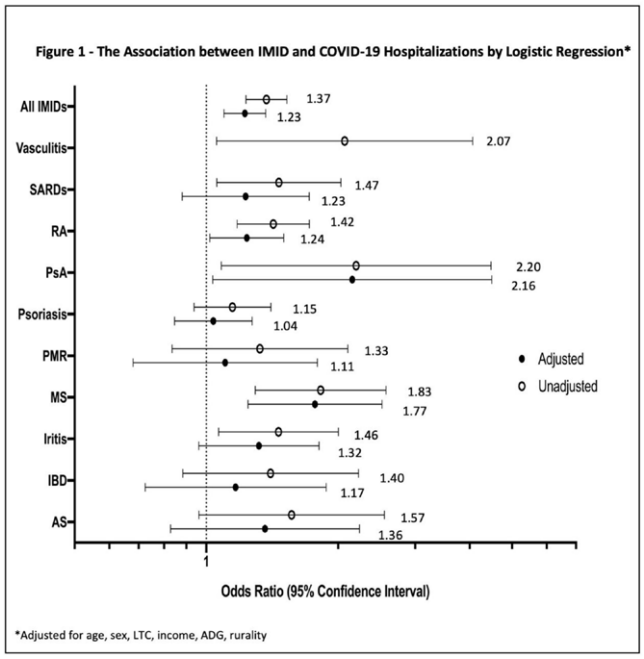

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OP0286 CHARACTERISTICS ASSOCIATED WITH SEVERE COVID-19 OUTCOMES IN SYSTEMIC LUPUS ERYTHEMATOSUS (SLE): RESULTS FROM THE COVID-19 GLOBAL RHEUMATOLOGY ALLIANCE (COVID-19 GRA)

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Background: An increased risk of severe COVID-19 outcomes may be seen in patients with autoimmune diseases on moderate to high daily doses of glucocorticoids, as well as in those with comorbidities. However, specific information about COVID-19 outcomes in SLE is scarce.

Objectives: To determine the characteristics associated with severe COVID-19 outcomes in a multi-national cross-sectional registry of COVID-19 patients with SLE.

Methods: SLE adult patients from a physician-reported registry of the COVID-19 GRA were studied. Variables collected at COVID-19 diagnosis included age, sex, race/ethnicity, region, comorbidities, disease activity, time period of COVID-19 diagnosis, glucocorticoid (GC) dose, and immunomodulatory therapy. Immunomodulatory therapy was categorized as: antimalarials only, no SLE therapy, traditional immunosuppressive (IS) drug monotherapy, biologics/targeted synthetic IS drug monotherapy, and biologic and traditional IS drug combination therapy. We used an ordinal COVID-19 severity outcome defined as: not hospitalized/hospitalized without supplementary oxygen; hospitalized with non-invasive ventilation; hospitalized with mechanical ventilation/extracorporeal membrane oxygenation; and death. An ordinal logistic regression model was constructed to assess the association between demographic characteristics, comorbidities, medications, disease activity and COVID-19 severity. This assumed that the relationship between each pair of outcome groups is of the same direction and magnitude.

Results: Of 1069 SLE patients included, 1047 (89.6%) were female, with a mean age of 44.5 (SD: 14.1) years. Patient outcomes included 815 (78.8%) not hospitalized/hospitalized without supplementary oxygen; 116 (11.2) hospitalized with non-invasive ventilation, 25 (2.4%) hospitalized with mechanical ventilation/extracorporeal membrane oxygenation and 78 (7.5%) died. In a multivariate model (n=804), increased age [OR=1.03 (1.01, 1.04)], male sex [OR =1.93 (1.21, 3.08)], COVID-19 diagnosis between June 2020 and January 2021 (OR =1.87 (1.17, 3.00)), no IS drug use [OR =2.29 (1.34, 3.91)], chronic renal disease [OR =2.34 (1.48, 3.70)], cardiovascular disease [OR =1.93 (1.34, 3.91)] and moderate/high disease activity [OR =2.24 (1.46, 3.43)] were associated with more severe COVID-19 outcomes. Compared with no use of GC, patients using GC had a higher odds of poor outcome: 0-5 mg/d, OR =1.98 (1.33, 2.96); 5-10 mg/d, OR =2.88 (1.27, 6.56); >10 mg/d, OR =2.01 (1.26, 3.21) (Table 1).

Table 1. Characteristics associated with more severe COVID-19 outcomes in SLE. (N=804)

	OR (95% CI)
Age, years	1.03 (1.01, 1.04)
Sex, Male	1.93 (1.21, 3.08)
Race/Ethnicity, Non-White vs White	1.47 (0.87, 2.50)
Region	
Europe	Ref.
North America	0.67 (0.29, 1.54)
South America	0.67 (0.29, 1.54)
Other	1.93 (0.85, 4.39)
Season, June 16th 2020-January 8th 2021 vs January-June 15th 2020	1.87 (1.17, 3.00)
Glucocorticoids	
0 mg/day	Ref.
0-5 mg/day	1.98 (1.33, 2.96)
5-10 mg/day	2.88 (1.27, 6.56)
=>10 mg/day	2.01 (1.26, 3.21)
Medication Category	
Antimalarial only	Ref.
No IS drugs	2.29 (1.34, 3.91)
Traditional IS drugs as monotherapy	1.17 (0.77, 1.77)
b/ts IS drugs as monotherapy	1.00 (0.37, 2.71)
Combination of traditional and b/ts IS	1.00 (0.55, 1.82)
Comorbidity Burden	
Number of Comorbidities (excluding renal and cardiovascular disease)	1.39 (0.97, 1.99)
Chronic renal disease	2.34 (1.48, 3.70)
Cardiovascular disease	1.93 (1.34, 3.91)
Disease Activity, Moderate/ high vs Remission/ low	2.24 (1.46, 3.43)

IS: immunosuppressive. b/ts: biologics/targeted synthetics

Conclusion: Increased age, male sex, glucocorticoid use, chronic renal disease, cardiovascular disease and moderate/high disease activity at time of COVID-19 diagnosis were associated with more severe COVID-19 outcomes in SLE. Potential limitations include possible selection bias (physician reporting), the cross-sectional nature of the data, and the assumptions underlying the outcomes modelling.

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declared, Akpabio Akpabio: None declared, Ranjeny Thomas: None declared, Suleman Bhana Consultant of: AbbVie, Horizon, Novartis, and Pfizer (all <$10,000) unrelated to this work, Wendy Costello: None declared, Rebecca Grainger Speakers bureau: Abbvie, Janssen, Novartis, Pfizer, Cornerstones, Jonathan Hausmann Consultant of: Novartis, Sobi, Biogen, all unrelated to this work (<$10,000), Jean Liew Grant/research support from: Pfizer outside the submitted work, Emily Sirotich Grant/research support from: Board Member of the Canadian Arthritis Patient Alliance, a patient run, volunteer based organization whose activities are largely supported by independent grants from pharmaceutical companies, Paul Sufka: None declared, Philip Robinson Speakers bureau: Abbvie, Eli Lilly, Janssen, Novartis, Pfizer and UCB (all < $10,000), Consultant of: Abbvie, Eli Lilly, Janssen, Novartis, Pfizer and UCB (all < $10,000), Pedro Machado Speakers bureau: Abbvie, BMS, Celgene, Eli Lilly, Janssen, MSD, Novartis, Pfizer, Roche and UCB, all unrelated to this study (all < $10,000)., Consultant of: Abbvie, BMS, Celgene, Eli Lilly, Janssen, MSD, Novartis, Pfizer, Roche and UCB, all unrelated to this study (all < $10,000), Milena Gianfrancesco: None declared, Jinoos Yazdany Consultant of: Eli Lilly and AstraZeneca unrelated to this project

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OP0287 IMMUNOMODULATORY THERAPIES FOR SEVERE FORMS OF COVID-19: A SYSTEMATIC LITERATURE REVIEW TO INFORM EULAR POINTS TO CONSIDER

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Background: The severe acute respiratory syndrome coronavirus 2 (SARS-CoV2) pandemic is a global health problem. Beside the specific pathogenic effect of SARS-CoV-2, a deleterious aberrant non-effective host immune response plays an important role especially in severe forms of COVID-19. There is intense investigation to explore the utility of immunomodulatory drugs commonly used in the Rheumatology arena as agents that may mitigate against COVID-19 to improve disease prognosis. Rheumatologists are used to the utilization of these immune targeted therapies.

Objectives: To summarize the available information on the use of immunomodulatory agents in severe COVID-19.

Methods: As part of a EULAR taskforce, a systematic literature search was conducted from January 2019 up to December 11, 2020. Two reviewers independently identified eligible studies according to the PICO framework P (population): patients with SARS-CoV-2 infection; I (intervention): any immunomodulator agent/strategy; C (comparator): any comparator; O (outcome) any clinical outcome including but not limited to mortality, admission to intensive care unit and clinical improvement. Data on efficacy and safety of immunomodulatory agents utilized therapeutically in SARS-CoV-2 infection at any stage were extracted. The risk of bias was assessed using validated tools.

Results: Of 60372 records, 401 articles were eligible for inclusion. Studies were at variable risk of bias. Randomised controlled trials (RCTs) were available for the following drugs: hydroxychloroquine (N=12), glucocorticoids (N=6), tocilizumab (N= 4), convalescent plasma (N=4), interferon beta (N=2), IVIg (N=2) and N=1 each for anakinra, baricitinib, colchicine, leflunomide, ruxolitinib, interferon kappa, and vilobelimab. For glucocorticoids, dexamethasone reduced mortality only in patients requiring respiratory support; while methylprednisolone reduced mortality in patients aged 60 years or over. Data from RCTs on tocilizumab are conflicting and definite conclusions cannot be drawn at this point in time, but recent studies suggest possible benefit in patients requiring respiratory support. Hydroxychloroquine was not beneficial at any disease stage, one RCT with anakinra was negative, one RCT with baricitinib+remdesivir was positive, and individual trials testing some other compounds provided interesting, albeit preliminary, results.

Conclusion: Although there is emerging evidence about immunomodulatory therapies for the management of COVID-19, conclusive data is scarce with some conflicting data. Since glucocorticoids seem to improve survival in some subsets of patients, RCTs comparing glucocorticoids alone versus glucocorticoids plus anti-cytokine/immunomodulatory treatment are warranted. This SLR informed the initiative to formulate EULAR points to consider on pathophysiology and use of immunomodulatory therapies in COVID-19.

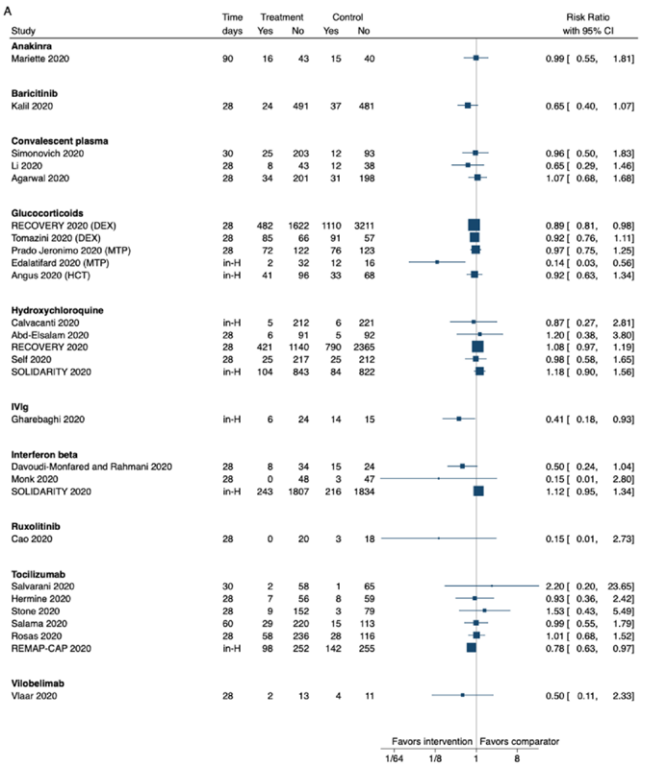

Figure 1. Forest plots showing the risk ratio (RR) and 95% confidence interval for mortality in randomized controlled trials divided by intervention. The latest follow-up available is reported in the timing column.

Disclosure of Interests: None declared

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OP0288 MACHINE LEARNING ALGORITHMS TO PREDICT COVID-19 ACUTE RESPIRATORY DISTRESS SYNDROME IN PATIENTS WITH RHEUMATIC DISEASES: RESULTS FROM THE GLOBAL RHEUMATOLOGY ALLIANCE PROVIDER REGISTRY

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